

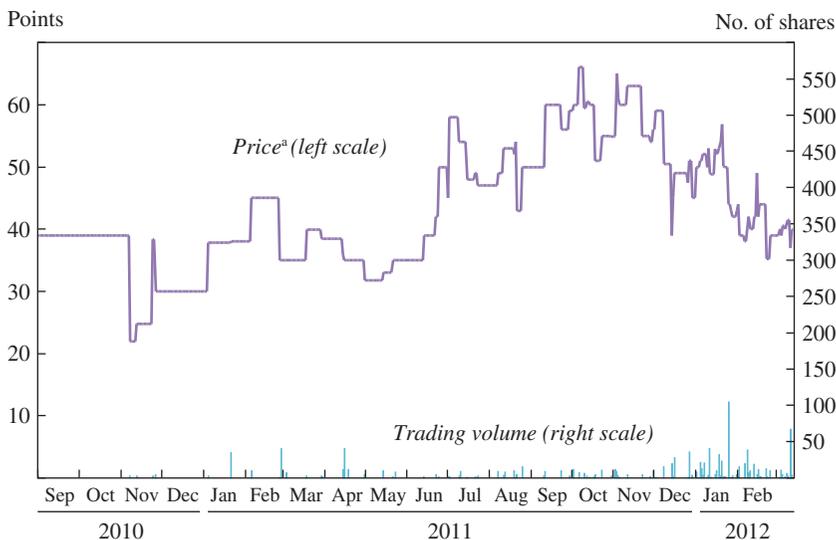
The Euro's Three Crises

ABSTRACT The euro area faces three interlocking crises that together challenge the viability of the currency union. There is a banking crisis: banks are undercapitalized and have faced liquidity problems. There is a sovereign debt crisis: a number of countries have faced rising bond yields and challenges funding themselves. Lastly, there is a growth crisis: economic growth is slow in the euro area overall and unequally distributed across countries. These crises connect with one another in several ways: the problems of weak banks and high sovereign debt are mutually reinforcing, and both are exacerbated by weak growth but also in turn constrain growth. This paper details the three crises, their interconnections, and possible policy solutions. Policy responses that fail to take into account the interdependent nature of the problems will likely be incomplete or even counterproductive. A broader point also becomes clear: a currency union may not need a fiscal union, but it does likely need both a financial union and some way to adjust for unbalanced economic conditions across countries.

Considered almost unthinkable just a few years ago, a breakup of the euro area is today viewed as possible. Prices on the online betting market Intrade in March 2012 suggested that the probability that at least one country currently using the euro would leave the euro area by the end of 2013 was roughly 40 percent; these odds peaked at over 65 percent as recently as November 2011 (figure 1). The head of the European Central Bank (ECB), Mario Draghi, has acknowledged the possibility of countries ceasing to use the euro. Although he argued that leaving the euro would have serious negative consequences, his admission of the possibility was a shift in rhetoric from earlier statements, which had dismissed it as absurd.¹

1. See, for example, Ralph Atkins and Lionel Barber, "Draghi Warns on Eurozone Break-up," *Financial Times*, December 18, 2011. The next day, however, Draghi made clear he believed the euro was permanent, saying, "I have no doubt whatsoever about the strength of the euro, about its permanence, about its irreversibility. Let's not forget, this was a key word at the time of the Maastricht treaty. The one currency is irreversible." Yet the fact that the head of the ECB found it necessary to go before the European Parliament to make this assertion itself shows the stresses on the system.

Figure 1. Intrade Prices Indicating the Probability of Exit from the Euro Area, August 2010–March 2012



Source: Intrade.

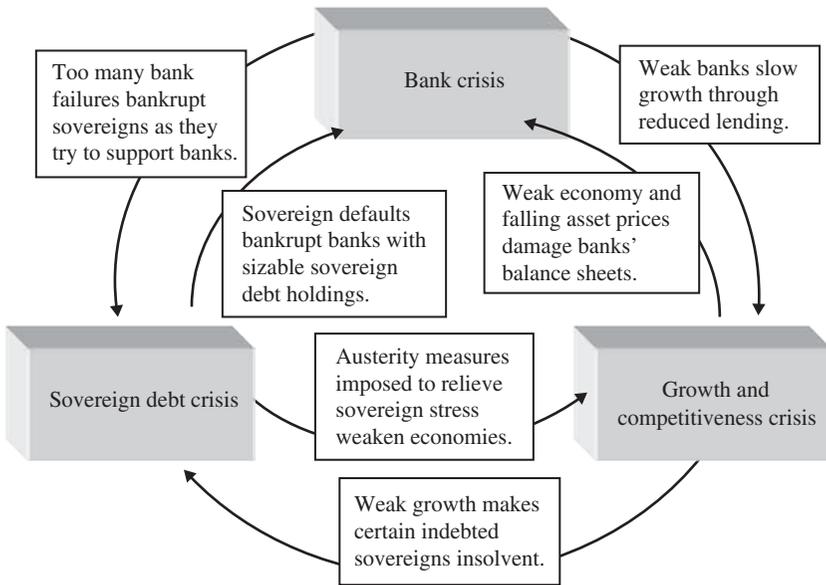
a. Price (in points worth \$0.10 each) of a share paying \$10 if any country currently using the euro as its currency announces its intention to drop it before December 31, 2012. The price can be interpreted as the market's estimate of the probability (in percent) of the event occurring.

In short, the euro area today is not merely in a period of slow economic growth, attempting to recover from a financial crisis; it is in a full-fledged existential crisis. This paper will argue that the euro area is really in three crises. Each of the three will prove difficult to solve, but crucially, all are also interdependent, such that a solution to one will be undone by the others unless they, too, are resolved.

The euro area is currently in a banking crisis, where banks face a capital shortfall, interbank liquidity is restrained, and future losses are uncertain. At the same time, it faces a sovereign debt crisis, where at least one country (Greece) will not pay its debts in full, and bondholders are displaying increasing concern about other sovereigns. Finally, it also faces a macroeconomic crisis, where slow growth and relative uncompetitiveness in the periphery add to the burden of some of the indebted nations. This last crisis is one primarily about the level and distribution of growth within the euro area.

The crises are interlinked in several ways. First, the sovereign debt holdings of euro-area banks are so large that if some of the debt-stressed sov-

Figure 2. The Euro's Three Crises



ereigns (Greece, Ireland, Italy, Portugal, and Spain, hereafter referred to as the GIIPS) cannot pay their debts, the banking system as a whole is insolvent. Second, and at the same time, attempts at fiscal austerity to relieve the problems due to sovereign stress are slowing growth. Yet without growth, especially in the stressed sovereigns, the sovereign debt crisis will persist. To complete the circle, continued troubles for the banks could bankrupt certain sovereigns, already struggling under the weight of supporting the banks within their jurisdictions, and failure of these banks could lead to a broken credit channel, which in turn could become a further constraint on growth. (Figure 2 shows the circular nature of the three crises.)

The creation of the euro meant that the boundaries that used to keep economic problems in one country limited to that country have effectively been erased. It also meant, however, that some of the tools available to solve problems at the national level are gone. In some cases the tools to solve the issues at the supranational level either have not been developed or have not been used. This puts extreme stress on individual countries facing a shock, and it puts other countries at risk, as they have less capacity to insulate themselves from distress in their neighbors. In the early months of the global financial crisis, some observers argued that the euro area was weathering the storm relatively well. In fact, the currency union seemed, if

anything, more stable than before, because countries had seen the damage that can accrue from facing a financial crisis as a small open economy with an independent currency.² In the next 2 years of the crisis, however, Europe and the euro moved to center stage.

Many of the policy responses thus far have been limited to addressing particular symptoms of individual crises: bailouts of national banking systems, austerity to balance budgets, massive infusion of liquidity to allow banks to buy more sovereign debt. Often, however, these policies may have helped with one crisis while making the others worse. In particular, the growth crisis, especially the question of short-run growth, has received insufficient attention. Recent liquidity provision by the ECB may be an important step toward a broader solution, but a more comprehensive solution is needed. A plausible process to generate growth in the GIIPS by increasing demand and strengthening their relative competitiveness is needed, as is a process to both recapitalize the banks and break the link between sovereigns and banks.

The challenges in responding to these three crises reflect the difficulties inherent in a monetary union of somewhat disparate economies that lacks the common political and economic institutions needed to manage various shocks. The euro area lacks institutions sufficient to deal with banking problems at the supranational level. It lacks a unified debt market, which means that investors who want to hold euro-area debt must pick and choose among various national debt issues. This makes a default by one member country more consequential than a default by a state or province within a country where banks and monetary authorities have a nationwide bond to use as a safe asset. Most important, the euro area lacks the ability to manage shocks that affect different parts of the region's economy differently. This lack of shock absorbers to handle geographically asymmetric shocks is not a new revelation. Indeed, it has been a persistent concern of economists who have questioned whether the euro area is really an "optimal currency area," that is, an area that should logically have one currency.

Institutional change that fixes at least the first two of these problems (the last is much more difficult) is likely to be more helpful to the functioning of the currency union than a fiscal compact that simply places limits on deficits. There has been movement toward a broader fiscal compact in the euro area, under the assumption that a currency union requires a fiscal union. The analysis in this paper suggests, however, that the evidence support-

2. See, for example, the introduction to Alesina and Giavazzi (2010) and some of the essays therein.

ing this assumption is weak. Instead, what a currency union likely needs is financial union, with common supervisors and safety nets, as well as some sort of process to manage asymmetric shocks.

In this paper I describe the three crises affecting the euro area and their interrelationships, with a particular emphasis on how the growth and competitiveness challenges may undermine any efforts that focus exclusively on the liquidity concerns of banks and sovereigns. The lack of the usual tools for adjustment at the national level dooms to failure any solution that ignores the growth and competitiveness problem. The alternative, an internal devaluation (relative price adjustments without a change in the nominal exchange rate), is rare among countries in an era of generalized low inflation, and a slow and painful route to rebalancing when it does occur.

The paper will not provide a blow-by-blow account of events in the euro area over the last 2 years, but will instead try to lay out a general framework for evaluating the current crises. The use of such a framework is not meant to imply that the problems are identical across countries. They are not. Greece's problems, for example, stem more from poor fiscal policies, Ireland's relate to its banks, and Spain's to a housing boom gone bad. But the policy responses and the way the crises interact do call for a more general framework to understand the crises and the policy options.

Given the importance of the euro area to the world economy, the current crisis has attracted a great deal of attention in academic, policy, and media circles. For example, Nouriel Roubini (2011a, 2011b), citing the problems of long-run external imbalances and the need for growth in the periphery, has argued that the euro project is unlikely to survive. Martin Wolf and Paul Krugman have emphasized the problems with fiscal austerity, the need for growth to escape the crisis, and the importance of resolving current account imbalances across countries.³ The Euro-nomics group (2011), composed of academics from various euro-area nations, has dubbed the connection between banks and sovereigns the "diabolical loop." Barry Eichengreen (2012) has highlighted the joint nature of the banking and sovereign crises and noted the connection from austerity to growth. And Martin Feldstein (2012) has pointed out the flawed design of a system that merges such disparate economies into a single currency area, and the difficulty of adjustment without exchange rate changes, as well as the problems inherent in attempting to restore fiscal solvency without

3. See the references cited in note 9 below and Paul R. Krugman, "Austerity and Growth." *The Conscience of a Liberal* weblog, *New York Times*, February 18 (krugman.blogs.nytimes.com/2012/02/18/austerity-and-growth/).

growth. This paper will try to add to this rapidly growing and changing literature by providing evidence as to how the three crises are interlinked and the special policy challenges this generates.

I. The Three Crises

This section describes each of the three crises individually. Section II turns to a discussion of their interlinkages and the policies that have so far been adopted in response.

I.A. The Banking Crisis

BANKS IN THE EURO AREA The banking system in the euro area—and in the European Union more broadly—is large. Total assets of the banking system were equivalent to over 300 percent of euro-area GDP in 2007, compared with less than 100 percent in the United States. (The U.S. data are for commercial banks only and thus do not include money market funds, commercial paper markets, and other nonbank financial institutions. As this “shadow banking” system is larger in the United States than in Europe, this can make a fair comparison of the EU and U.S. banking systems difficult.) The large size of the banking system relative to other parts of the euro-area financial system highlights another important fact: firms in the euro area rely more on the banking system for financing than do American firms, which are more likely to access the capital markets directly; this makes the health of the banking system particularly important in Europe. Furthermore, the largest individual banks in the United States and in Europe are roughly the same size in terms of total assets, and thus roughly the same size in proportion to their respective GDPs. This implies that the largest euro-area banks are much larger in proportion to their home economies, or indeed to any individual national economy in the region. For example, ING Bank in the Netherlands is smaller than several of the largest U.S. banks, but given that Dutch GDP is roughly one-twentieth U.S. GDP, it is huge relative to its home economy. In fact, ING’s assets exceed the GDP of its host country; in contrast, no U.S. bank has assets greater than one-eighth of U.S. GDP.

The largest euro-area banks are also highly global in their orientation (see McGuire and von Peter 2009, Shin 2012). This partly explains why they can be so large relative to host-country GDP, but it also makes their national supervision and backing all the more problematic.

THE NATURE OF BANK CRISES Banks typically have short-term liabilities (deposits) but long-term, illiquid assets (loans), leaving them vulnerable to a bank run. Because information is imperfectly shared, depositors and other

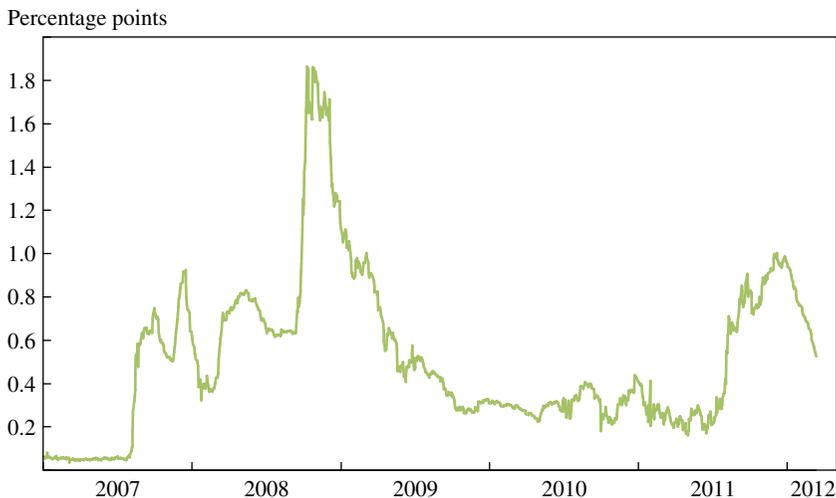
creditors have difficulty knowing whether a bank is solvent, and they may try to withdraw their funds if they fear a problem. If too many short-term creditors withdraw funds at once, even a healthy bank will have trouble meeting the demand, because many of its assets are loans or other securities that are hard to liquidate quickly.⁴ Thus, a problem in a banking sector can be one either of liquidity (banks are solvent but cannot get or retain funds because of uncertainty regarding their balance sheets) or of solvency (banks simply do not have assets, liquid or illiquid, of enough value to pay their creditors in full).

The dividing line can blur, however, if liquidity pressure forces a bank to sell assets at fire-sale prices or to borrow at crippling high rates to replace funds that had been provided more cheaply before. When this happens, an institution that was merely illiquid may become insolvent. In a liquidity crisis, a central bank can step in as a lender of last resort, providing funds that the market is unwilling or unable to provide. But if a bank becomes truly insolvent, losses must be taken by its equity investors, its creditors, taxpayers, or some combination. If there is a threat of insolvency, an injection of capital might guarantee solvency by providing the bank a bigger cushion against losses. This, however, still imposes losses on equity holders (as their share of ownership in the bank is diluted) and possibly involves costs to taxpayers as well (if the injection comes from public funds).

Despite the increase in global banking activity over the last several decades, bank supervision and resolution of banking solvency problems are still primarily national activities, even in the euro area where funds can flow freely in the same currency across borders. The creation of the European Banking Authority has centralized some functions, but supervision and especially fiscal support are still provided at the national level. The provision of liquidity, however, is by its nature a central bank activity, as only a central bank can instantly create as much liquidity as needed. In theory, this leaves the role of providing liquidity to euro-area banks to the ECB, a euro-area-wide institution. But the ECB has no statutory responsibility to serve as the lender of last resort, although it can act as one (Obstfeld 1998).

THE BANK CRISIS OF 2007–? In 2007, liquidity problems surfaced in both the United States and Europe. U.S. home prices had started to decline, and assets tied to U.S. mortgages became questionable in value. Banks in both

4. Although deposit insurance can prevent a classic bank run by depositors, other sources of funds, such as repurchase agreements, are still vulnerable to bank run–like behavior. See Diamond and Dybvig (1983) for the classic treatment of the problem of a bank run and the structure of the banking system.

Figure 3. EURIBOR-EONIA Swap Spread,^a January 2007–March 2012

Source: European Banking Federation.

a. Difference between the 3-month euro interbank offered rate (EURIBOR), the interest rate at which euro interbank 3-month deposits are offered by one prime bank to another prime bank within the euro area, and the EONIA swap index. An EONIA swap is an interest rate swap transaction in which one party agrees to pay interest at a fixed rate to another party in exchange for receiving interest at a floating rate based on EONIA (the euro overnight interest average).

Europe and the United States faced large losses, and growing uncertainty about the quality of their assets made it increasingly difficult for them to borrow.⁵ One indicator of banks' difficulty in finding funds is the difference, or spread, between the interest rate that banks charge one another for short-term funds and a "safe" rate. In the euro-area banking market, the relevant spread is that between the European interbank offer rate (EURIBOR) and the euro overnight index average (EONIA) swap rate.⁶ As figure 3 shows, the EURIBOR-EONIA swap spread rose in 2007 and early 2008 and then spiked sharply upward in the fall of 2008 after the failure of

5. See Fender and Gyntleberg (2008) for a real-time discussion of the progression of the liquidity crunch, and Gorton (2008) for a description of how bank and nonbank funding problems led to a bank run–like crunch in liquidity. Housing bubbles also emerged in a number of EU countries, leaving some euro-area banks exposed to their own real estate markets as well.

6. The EONIA swap index is a secured short-term interest rate (swapping payments of fixed and floating rates without principal) whereas the EURIBOR is an unsecured loan rate. The spread between them is generally used as the main indicator of financial stress in Europe.

Lehman Brothers. The patterns for the U.S. and U.K. banking markets during this same period are not shown but were similar.

Central banks in both the United States and Europe stepped in to solve these problems in a number of ways. First, they cut the interest rates they charged banks to borrow from them; second, many central banks dramatically increased the amount of assets they held on their own balance sheet and the volume of loans they made to the banking sector. Finally, because of the particular difficulties faced by non-U.S. banks that needed dollar funds (because they had borrowed short term in dollars and held illiquid U.S. assets), a number of “liquidity swaps” were arranged whereby the Federal Reserve provided funds in dollars to other central banks, which in turn provided collateral to the Federal Reserve. This allowed the ECB and other non-U.S. central banks to provide funds in dollars directly to their banks that needed them.⁷

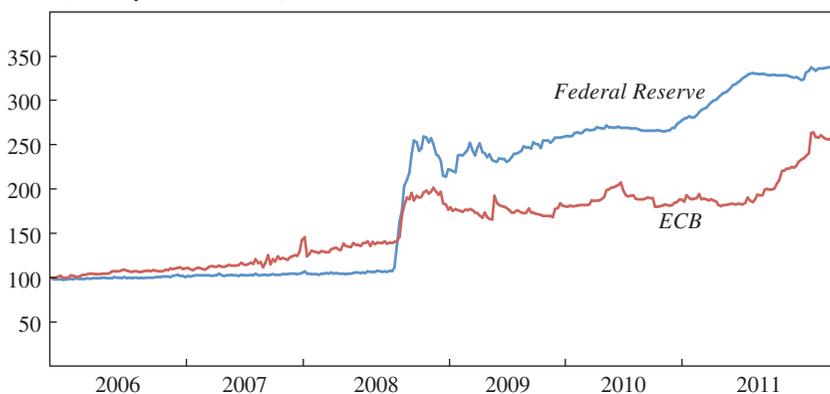
The initial response of the ECB to the crisis differed somewhat from those of other major central banks. Although the ECB eventually did follow its counterparts in lowering interest rates, it did not do so in response to the initial funding problems in the summer of 2007, and in fact it raised rates in July 2008 before cutting them following Lehman’s collapse. Nor did the ECB increase the size of its own balance sheet as dramatically in the first few years of the crisis as did the Federal Reserve (figure 4). Rather, the ECB expanded its balance sheet moderately at the peak of the crisis and then held it at that level. The 39 percent increase in its assets between August 2008 and August 2011 pales in comparison with the nearly 210 percent increase in assets of the Federal Reserve. Early on, one might have argued that this more modest response was understandable, given the crisis’s initial trigger in U.S. asset markets. In the ensuing months, however, euro-area banks continued to face problems, yet the ECB did not increase its balance sheet further until mid-2011 (as discussed later). The ECB did undertake a number of actions to try to ensure liquidity in the interbank market, including increasing the maturity of its loans to banks (see Giannone and others forthcoming). Despite the ECB’s more restrained response, the initial liquidity crush on euro-area banks did calm down, and rates in interbank markets returned to more normal levels, as figure 3 shows.

The bank crisis was not settled, however. The losses that helped trigger liquidity problems also helped generate solvency problems. Euro-area

7. In these transactions the Federal Reserve takes on no risk from the other country’s banking system, but only from the other central bank. In addition to the collateral that it holds from the other central bank, it obtains a guarantee to reswap currencies later at the same exchange rate. See Obstfeld, Shambaugh, and Taylor (2009) for an early analysis.

Figure 4. Balance Sheets of the Federal Reserve and the European Central Bank, January 2006–March 2012

Index (January 4, 2006 = 100)



Sources: Board of Governors of the Federal Reserve System and European Central Bank.

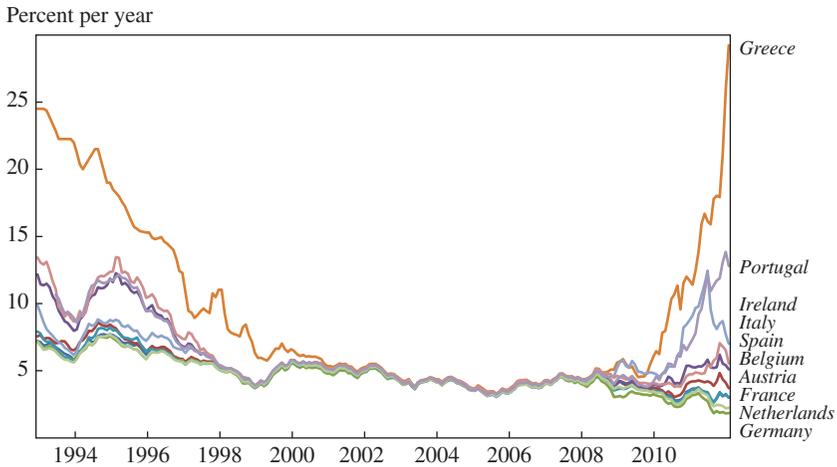
banks required a series of bailouts and guarantees and continue today to struggle with undercapitalization. These issues and the ways in which the bank crisis and problems in sovereign debt markets are linked are discussed in sections II.B and II.C.

1.B. The Sovereign Debt Crisis

RECENT PRESSURE IN SOVEREIGN DEBT MARKETS The sovereign debt crisis in the euro area has gone through a number of acute phases, where yields on the bonds of some euro-area governments jumped to very high levels. Market participants tend to focus on the yield spread between a country's bonds and those of Germany as an indicator of stress in the market for the former's sovereign debt. Investors might demand different interest rates on the bonds of two countries if the currency of one of them is expected to strengthen against the other (because then the bond denominated in the strengthening currency will be worth more over time, and investors will be willing to hold it even if it pays a lower interest rate), or if investors worry that one of the governments will default (because the country more likely to default will have to pay a higher interest rate to compensate investors for the risk).

Figure 5 shows interest rates on long-term government debt in 10 euro-area countries over the last two decades. Before the euro was introduced, interest rates between these future euro-area members differed widely. As

Figure 5. Ten-Year Yields on Sovereign Bonds of Euro-Area Countries, January 1993–February 2012



Source: Eurostat.

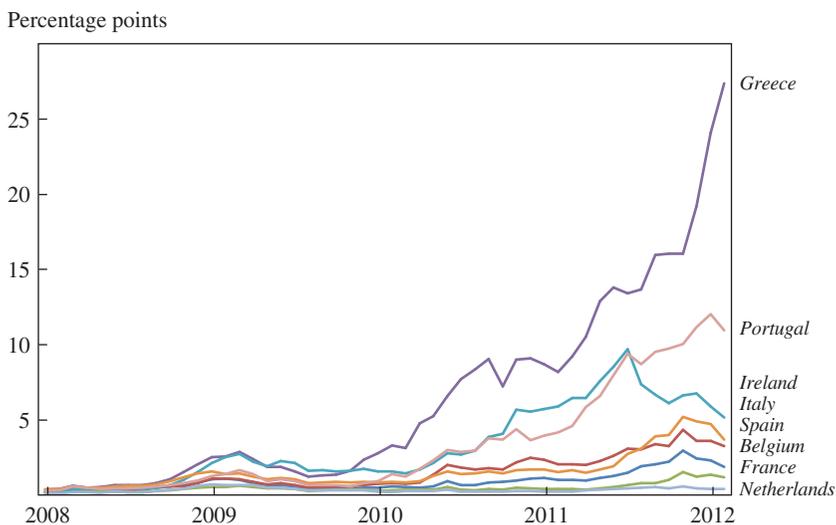
the euro removed the possibility of changes in exchange rates between their currencies—and with the implicit assumption that no euro-area country would default—these rates converged. (Greece joined the euro in 2001, and therefore its interest rate converged slightly later than those of the other nine countries, which joined in 1999.) Figure 6, which focuses on spreads over German bonds in the recent period, shows that the first year of the crisis still saw relatively narrow spreads. In 2010, however, spreads began to widen, first for Greece and then for a number of other countries. The euro area overall is solvent, with a debt-to-GDP ratio below 90 percent; therefore these widening spreads indicate doubts only about the solvency of these individual countries.

THE NATURE OF DEBT SUSTAINABILITY The basic equation for debt sustainability is

$$(1) \quad \Delta D_t = (R_t - g_t) \times D_{t-1} + \text{primary},$$

where D is the debt-to-GDP ratio, R is the nominal interest rate, g is the nominal growth rate, and “primary” represents the primary (that is, non-interest) budget deficit scaled to GDP. The intuition is that this year’s debt scaled to GDP is the same as last year’s plus interest plus any new borrowing (or saving) beyond interest accrued, minus the degree to which GDP

Figure 6. Ten-Year Yield Spreads of Euro-Area Country Bonds over German Bonds, January 2008–February 2012

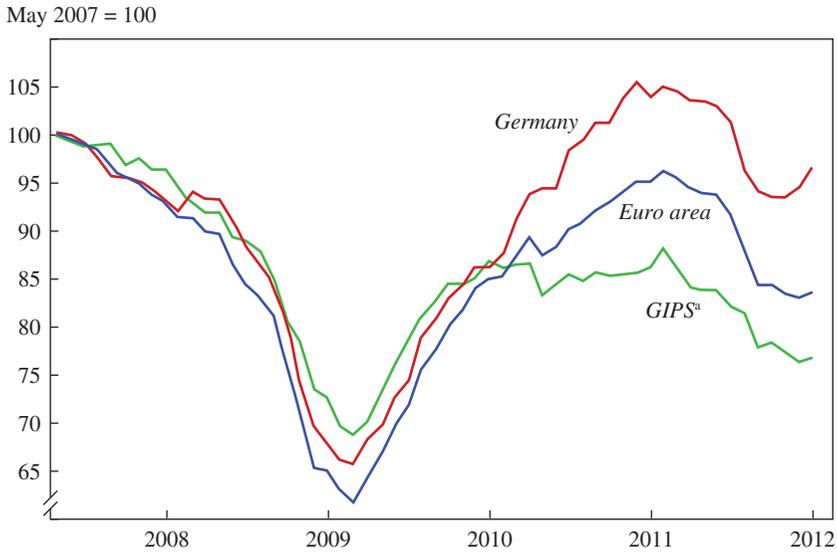


Source: Eurostat.

(the denominator of D) grows to offset increases in the debt (the numerator). If the interest rate paid on the outstanding debt exceeds the growth rate of the economy, then even if the primary budget is in balance, debt as a share of GDP will grow. Importantly, the converse also holds. Even a country with a primary budget deficit of 2 percent of GDP could have a shrinking debt-to-GDP ratio if the growth rate of the economy exceeds the interest rate. The larger the stock of outstanding debt, the more important the interest rate and the growth rate will be. A country with a large debt (say, 100 percent of GDP) that cuts its government spending will face an increasing debt-to-GDP ratio the following year if the multiplier on government spending is at least 1. A higher multiplier (or a higher debt-to-GDP ratio) will generate an even bigger effect.⁸

8. The precise impact will depend on the initial growth rate, the interest rate, and whether the interest rate in any way responds to the budget cuts. If the cuts are permanent and have an impact on growth only in the first year, then over time the cuts will improve the debt-to-GDP ratio, but in the first year, they may not only lower growth but even make the debt load worse. Cuts phased in over time can lead to a lower debt-to-GDP ratio despite the additional spending in the intervening years if the multiplier is lower later in the cycle when the economy is stronger.

Figure 7. Economic Sentiment in the Euro Area, Germany, and the GIPS, May 2007–January 2012



Source: European Commission.

a. Unweighted average for Greece, Italy, Portugal, and Spain. (Ireland is omitted because data are not consistently available.)

In this sense a sovereign debt crisis can act much like a bank crisis. A country that can fund itself with low interest rates may be solvent, but the very same country forced to pay a higher interest rate may suddenly be feared to be insolvent, even if its primary budget is in balance. But slow growth can also doom an otherwise solvent country to insolvency.

I.C. The Growth Crisis

THE CURRENT SLOWDOWN AND GAPS IN PERFORMANCE The euro area, along with most of the world, emerged from recession in 2009. Growth started again, and at various points in time the euro area appeared to be recovering from the financial crisis more quickly than the United States or Japan. Even as the recovery proceeded, however, evidence emerged of a problem with the distribution of growth across the currency union. Euro-area economic sentiment (a combination of consumer and business confidence, reported by the European Commission) demonstrates the issue clearly (figure 7). Sentiment in Germany and the average for Greece, Italy, Portugal, and Spain (the “southern tier”) dropped in tandem during the crisis and

then rebounded in tandem through 2009. The euro area as a whole appeared to continue this steady improvement through 2010, with just a brief slow-down around the first sovereign debt scare in the spring, but the area average masked wide disparity. Even as German economic sentiment was rising and by September 2010 had in fact surpassed its precrisis peak, the southern tier countries remained stuck at a low level of business and consumer confidence. By early 2011, sentiment was falling everywhere.

This sluggish confidence is understandable given the performance of unemployment. By June 2010 the German unemployment rate was already below its precrisis level, and in a number of other northern countries unemployment rates were falling steadily. The euro-area average, however, remained stuck at 10 percent as unemployment rates in the GIIPS continued to climb long after the official recession had ended. By the fourth quarter of 2011, the euro-area-wide rate had reached a new high of 10.7 percent as unemployment rates kept rising in the GIIPS, pulling the overall rate upward. It is not clear that unemployment rates in the periphery (youth unemployment is near 50 percent in some countries) are politically sustainable.

Weighed down by weak performance in the GIIPS, the euro area on net has been growing slowly—just 0.7 percent over the four quarters of 2011. The weighted average of growth in the GIIPS countries was roughly –1 percent over that time, while the rest of the euro area grew by roughly 1.5 percent. As the crisis has worsened in the countries undergoing severe austerity, the euro area overall has likely slid back into recession. Euro-area GDP contracted in the fourth quarter of 2011 by more than 1 percent at an annual rate. GDP fell not just in the GIIPS but in Germany, the Netherlands, Belgium, and Austria as well. The January 2012 forecast of the International Monetary Fund (IMF) suggested that the overall euro-area economy would contract during the four quarters of 2012, with the Spanish and Italian economies shrinking by more than 2 percent.

Thus, the euro area has in a sense two aspects of a growth crisis. First, the euro-area economy as a whole is growing too slowly to reduce unemployment and support existing debt. Facing historically high unemployment and the likelihood of a second recession within 3 years, the region needs faster growth. At the same time, the distribution of growth across the euro area is unbalanced, with those economies facing the greatest pressure in bond markets growing most slowly. As the previous section showed, this means that these countries are quite likely to continue to struggle with their debt burden, because they need growth to become solvent. Thus, regardless of what is done to meet their liquidity and funding needs, and even if the

banking system avoids collapse, without growth in the GIIPS, the crisis in the euro area overall cannot end.

IMBALANCES This imbalance of growth is often described as a problem of current account imbalances within the euro area.⁹ In that perspective, the chief problem in the GIIPS is their large current account deficits before the crisis and their buildup of overall debt (not just government debt), in particular debt owed to foreigners (the external debt). The current account deficits and the growth crisis are clearly linked. The precrisis current account imbalances likely signaled competitiveness problems in the periphery. Even if one assumes that those imbalances were primarily a reflection of capital flows, not of a lack of competitiveness *ex ante*, the capital inflows helped increase prices, which made the recipient countries less competitive *ex post*. Further, as prices rose in the peripheral countries, their real interest rates fell relative to those in the rest of the euro area, encouraging still more borrowing (see Lane 2006). Regardless of the cause, today's current account deficits and lack of competitiveness in the periphery are a drag on demand, and hence these imbalances matter because of their connection to growth. Improved exports or reduced imports could increase GDP in these economies, given how far they are from full employment. Further, the imbalances ahead of the crisis highlighted the buildup of debt that now requires painful deleveraging. Early on, Olivier Blanchard and Francesco Giavazzi (2002) argued that these current account deficits (still modest at the time) might not be a problem within the euro area, if they simply reflected increased consumption in these poorer countries in anticipation of higher growth rates in a newly unified market. More recently, with 10 more years of experience to analyze, Maurice Obstfeld (2012) has argued that policymakers should remain wary of current account deficits even within a currency union, especially if national governments, not the union as a whole, are responsible for national financial stabilization.

At the same time, although current account imbalances within a monetary union may be a symptom of problems, these imbalances are different from those of a national economy with its own currency. Such an economy with a current account deficit may face a liquidity problem if

9. See Martin Wolf, "Merkozy Failed to Save the Eurozone," *Financial Times*, December 6, 2011, and "The Pain in Spain Will Test the Euro," *Financial Times*, March 6, 2012; Paul R. Krugman, "European Crisis Realities," *The Conscience of a Liberal* weblog, *New York Times*, February 25 (krugman.blogs.nytimes.com/2012/02/25/european-crisis-realities/); and Ryan Avent, "Who Killed the Euro Zone?" *Free Exchange* weblog, *The Economist*, November 28, 2011 (www.economist.com/blogs/freeexchange/2011/11/euro-crisis-21) along these lines.

foreign investors refuse to continue lending (that is, a “sudden stop” can occur), and domestic residents may pull capital out of the economy as well, so that the entire economy, not just the sovereign, faces a liquidity run. This generally results in a crash of the currency or a closing of international financial mobility.¹⁰ In the euro area, however, a payments crisis in one country cannot manifest as a currency run. Furthermore, money continues to flow to the borrowing country through internal ECB channels.¹¹ Payments problems can still exist. If no one will lend to the banks or the government, outside aid must be sought (as happened with Greece, Portugal, and Ireland), but a full-fledged currency crisis does not happen as there is no national currency on which to run. Thus, in many ways the acute problem with the imbalances is on the demand side. Given the deleveraging in the private sector and the austerity of fiscal policy, these countries desperately need improved current account balances to provide extra demand. Some have shown recent improvements in their current account balances, but they will need substantial continued export growth to offset reduced government spending and consumption.

For the peripheral economies to increase their growth by increasing exports (or by shifting consumption toward domestic goods and away from imports), their domestic prices must fall relative to other goods and services prices on world and euro-area markets.¹² Relative prices against the world matter because it is the overall current account balance that matters for aggregate demand. But the within-euro-area comparisons are also relevant, for two reasons. First, because trade within the euro area is high, a substantial percentage of the GIIPS’s export markets are within the euro area. Second, and more important, the exchange rate of the euro will fluctuate.

10. Insolvency for a country or an entire economy, however, is more complex. One can generate an aggregate balance sheet for a country, but it is just that: aggregate. Asset holders are not responsible for debtors, and there is no direct question of solvency. Further, many liabilities may be in the form of equity, including foreign direct investment, not debt, which must be repaid regardless of outcomes.

11. Capital flight has occurred, as bank deposits in some GIIPS have declined substantially, but the within-euro-area central bank transfer system, TARGET2, has ensured that banks within the GIIPS still have enough liquidity as they borrow from the ECB through their national central bank. There has been some controversy over the importance of the TARGET2 system and its implications for credit risk at the national central banks of the surplus countries. See Sinn and Wollmershaeuser (2011) and ECB (2011) for two sides of this issue.

12. This assumes that trade elasticities operate such that a fall in relative prices is made up for with an increase in the volume of exports relative to imports. If, however, the volume of trade is not responsive, the fall in relative prices, by making imports more expensive and exports less so, could actually worsen the trade balance.

tuates depending on economic conditions in the euro area overall. If all countries in the euro area were struggling with a lack of competitiveness on world markets, one would expect the euro to fall in value. Competitiveness, after all, is not something intrinsic to a society or an economy; it is about relative prices. An uncompetitive economy whose currency weakens can become competitive on world markets overnight. But the euro exchange rate will be determined by conditions in the euro area overall. Thus, a lack of competitiveness of the monetary union as a whole means that the goods and services of each member country will remain overvalued in world markets.

CURRENCY AREA THEORY AND ASYMMETRIC SHOCKS The problem of adjusting to asymmetric shocks within the euro area was not unexpected. Ever since Robert Mundell's (1961) classic analysis, economists have studied the question of what constitutes a sensible currency union. At the time the euro was created, many economists (especially outside the euro area; see Jonung and Drea 2009 for a discussion of U.S. economists' views before the euro's launch) worried that the lack of labor mobility and of fiscal policy offsets within the euro area would pose a problem, because when different shocks hit different parts of the currency union, there would be no policy levers available to offset them. Countries would no longer run their own monetary policy, and exchange rates could not adjust within the union, leaving the potential for one part of the union to remain mired in high unemployment while another enjoyed a strong economy (Obstfeld 1997). The hope was that before the area was truly tested by a severe shock, euro-area labor flexibility and mobility would improve or cross-country fiscal transfers would rise as euro-area political institutions grew. That did not happen, and now, as a consequence, countries are struggling with high unemployment and no policy lever to combat it. The only remaining short-run policy lever—increased fiscal spending to combat the recession—has been taken away by the pressure in the sovereign debt markets and the lack of cross-country support beyond measures to forestall default (long-run structural policies are discussed in section II.A).

Comparison with the United States is informative. The United States certainly has seen disparate shocks hit the economy. Much like Spain and Ireland, Nevada and Florida have recently experienced massive real estate booms followed by busts. And just as in Europe, the economies of the different regions of the United States differ in important ways. New York acts as a financial center, Hawaii as a tourism center, and the Midwest is more manufacturing intensive than many parts of the United States just as Germany is more manufacturing intensive than many parts of the euro area.

Yet despite these similarities, the United States has not seen the continued divergence in labor market outcomes that has appeared in the euro area. The range of unemployment rates across U.S. states has fallen slightly, from 10.3 percentage points at its peak in December 2010 to 9.7 percentage points at the end of 2011 (still roughly double the precrisis range). In contrast, the corresponding range across euro-area countries started out wider and has grown, from 15.7 percentage points to 19.1 percentage points (more than two and a half times the precrisis range), over the same period.¹³

Labor mobility across regions can help in adjusting to shocks, as people move from areas without jobs toward areas with jobs. Although the exact degree of labor mobility across U.S. states is a matter of debate, it is typically accepted that it is higher than across countries of the euro area. Blanchard and Lawrence Katz (1992) argue that state unemployment rates tend to return to the national average in the United States after an adverse regional shock, not because employment improves or participation rates change, but rather because workers leave the affected states.¹⁴ Obstfeld and Giovanni Peri (1998) warned that mobility in what was to become the euro area was lower even *within* countries (for example, within Italy or within Germany) than in the United States, suggesting that after currency union, the euro area would be left with little ability to adjust to shocks.

The United States also has important fiscal shock absorbers whose impact is felt across regions: when an individual in one state loses a job, that state as a consequence sends less tax revenue to the federal government but receives more back in transfers. It is true that such a fiscal cushion cannot last forever. If a country faces a need for adjustment (either because of a permanent shock or because of imbalances that have built up over time), it can delay the adjustment with expansionary fiscal policy, but eventually some mechanism must generate adjustment (see Blanchard

13. The comparison is not exact, as there are 50 U.S. states but only 17 current euro-area countries. But this difference should tend to widen the range of U.S. state unemployment rates relative to that across euro-area countries, so that the observed difference in ranges is all the more striking.

14. Decressin and Fatás (1995) also argue that migration absorbs shocks in the United States such that unemployment tends to return to normal, whereas in Europe, labor participation, not migration, changes after a shock. Rowthorn and Glyn (2006) raise methodological concerns about the original Blanchard and Katz results and find less evidence that unemployment rates across states converge after a shock. Feyrer, Sacerdote, and Stern (2007) provide a detailed analysis of the impact of shocks to the auto and steel industries and find results similar to those of Blanchard and Katz.

1998 for a discussion). But the GIIPS today are left with no fiscal cushion (intra-EU transfers are small) and no immediate path of adjustment.¹⁵

II. Connections across Crises and Incomplete Policy Approaches

Section I demonstrated that linkages exist across the euro area's three crises. This section examines these linkages further by discussing in turn the six connections—one in each direction between each pair of crises—highlighted in figure 2. Often the linkages stem from the policies used to combat the individual crises, and these policies are discussed as well. The discussion also highlights the institutional holes left at the time the euro was created. The ECB was given a 2 percent inflation target and no other formal objective or clear responsibility. Its responsibility for supporting banks with liquidity was ambiguous, and that for supervising banks was absent. Although legal restrictions on workers crossing borders were removed, mobility remained low, and there was no other mechanism to offset shocks. The only institution added as part of the 1992 Maastricht Treaty and its refinements was the Stability and Growth Pact, which restricted countries' public budget deficits. A combination of politics and ideology meant that public sector borrowing and inflation were supposed to be controlled, but private borrowing, banking system issues, unemployment, and other macroeconomic challenges were left unattended at the euro-area level. The politics of these choices made at the creation of the euro are beyond the scope of this paper, but the choices themselves have left great challenges for current policymakers.

II.A. The Impact of Weak Growth on the Sovereign Debt Crisis

Because a default means a country cannot or will not pay back what it has borrowed, the sovereign debt crisis in the euro area is often viewed through the lens of fiscal profligacy. This tendency is heightened by the fact that the first country to experience pressure in the financial markets during the current crisis was Greece, a country whose problems have centered around large budget deficits and inaccurately reported government finances. From this perspective, the root cause of the crisis is irresponsible

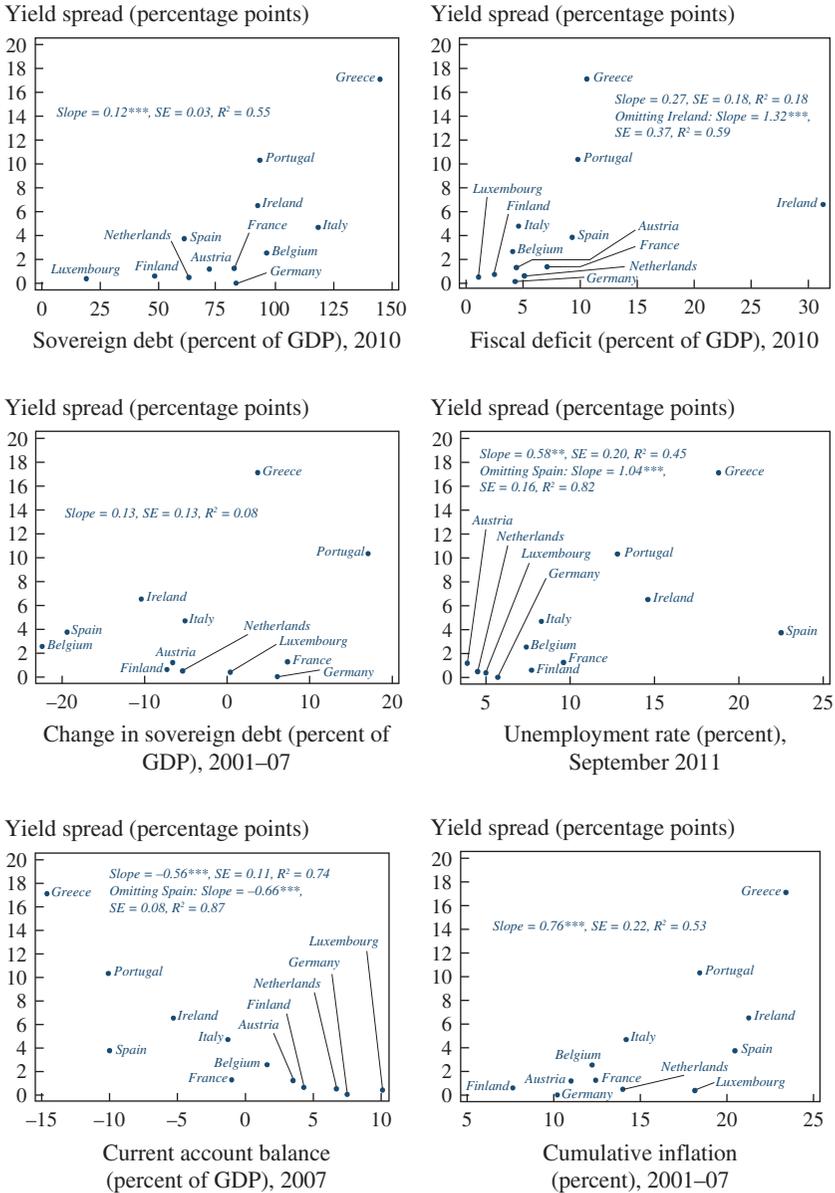
15. Blanchard's (2007) analysis of Portugal is an important contribution as it highlights that these problems were often in evidence even before the crisis took hold. Furthermore, the solutions were not easy even then, despite a stronger external environment and less sovereign debt pressure.

fiscal policy, all that is needed is to ratchet down deficits through public austerity, and if budgets cannot be balanced immediately, some short-term financing from other governments or the IMF may be needed.

A review of which euro-area countries are currently facing pressure in sovereign debt markets demonstrates, however, that adequate growth and macroeconomic fundamentals—not just appropriate fiscal policies—are crucial to solvency. The top left-hand panel of figure 8 plots, for each of the 12 country members of the euro area since 2002, its sovereign debt in 2010 against the spread between that country's 10-year government bond rate and that of Germany as of 2011Q4. In general, countries with more debt face wider spreads, but the relationship is far from a perfect fit. Spain, for example, has a lower ratio of debt to GDP than Germany, France, or Austria yet pays a substantially higher interest rate. One can instead look at countries' fiscal deficits in 2010, to see whether it is the change in the debt, not the level, that has markets worried. Here again, as the top right-hand panel of figure 8 shows, the relationship looks broadly sensible (Ireland's deficit is an outlier generated by the huge costs associated with its bank bailout.)

Another possibility is that both the level of debt and the current fiscal deficit are simply related to the depth of the shock that a country faced or the amount of private sector liabilities that its government absorbed during the crisis. Thus, one may instead prefer to look at the trend in public finances before the crisis to see whether fiscally irresponsible governments are the ones being singled out for punishment by the markets. This is also the appropriate test to see whether a failure of euro-area institutions to rein in bad fiscal behavior in the first decade of the currency union was the problem (and consequently whether a new fiscal pact limiting deficits is likely to prevent future problems). The middle left-hand panel of figure 8, however, does not support the idea that profligate governments took advantage of low interest rates to behave irresponsibly and are now being punished: the relationship between the change in debt from 2001 through 2007 and the 2011Q4 interest rate spread is weak and not statistically significant. Before the crisis, Spain and Ireland were both cutting public debt as a share of GDP, not raising it. Portugal was certainly running up its public debt, but France and Germany have the second- and third-largest increases in public debt, yet unlike Portugal they currently enjoy very low bond yields. It is true that the budgets of some countries (such as Ireland and Spain) were supported by tax revenue that was inflated by their housing bubbles, but to say that countries inadequately buffered themselves against future hard times during a boom is different from accusing them of fiscal profligacy.

Figure 8. Ten-Year Yield Spreads over German Bonds, 2011Q4, and Selected Economic Indicators in Euro-Area Countries^a



Source: Eurostat and author's regressions.

a. All regressions reported are simple ordinary least squares regressions and include a constant term. Asterisks indicate statistical significance at the ***99 percent, **95 percent, or *90 percent level.

One might instead look to the magnitude of the shock itself to explain markets' fears about certain countries' ability to repay. To examine this question, the middle right-hand panel of figure 8 plots countries' September 2011 unemployment rates against the spreads on their sovereign debt. The relationship is similar in terms of significance and explanatory power to that in the top left-hand panel. Again, though, causality could run in either direction: it may be that the countries currently being challenged by the markets have had to tighten their budgets so much that the unemployment rate has risen under the austerity. But the same picture using unemployment rates as of the end of 2009 (not shown) is quite similar, suggesting that the size of the shock may indeed be a determinant of current bond spreads.

A different picture is obtained by looking not at fiscal deficits but at current account deficits on the eve of the crisis. The current account deficit represents an economy's shortfall in trade of goods and services, but it also represents net borrowing by all participants in the economy from the rest of the world: if a country buys more from abroad than it sells abroad, it must borrow the difference from abroad. If many private sector debts wind up becoming public debts in a crisis (because of bank bailouts or other government aid to the economy), one would expect that heavy borrowing before the crisis anywhere in the economy will tend to lead to problems with sovereign repayment today. This, however, suggests that the problem is with total borrowing in the economy, and external borrowing in particular, not with government borrowing per se. Alternatively, one could view the large current account deficits as a sign that a country's goods and services are mispriced on world markets. In this case one might expect that countries with large current account deficits before the crisis will have large spreads today, because investors question their ability to grow enough to repay the current debt. Indeed, the bottom left-hand panel of figure 8 shows a nearly perfect relationship between countries' current account balances in 2007 and their spreads over German debt in 2011Q4. In other words, it is those *countries* that were borrowing (as opposed to those whose *governments* were borrowing) that are currently under attack. (Nor is the relationship using 2007 current account deficits simply a fluke; although not shown in figure 8, the picture is nearly identical if one looks instead at the sum of current account balances over 2001–07.)

Finally, the bottom right-hand panel in figure 8 plots countries' changes in overall prices from 2001 to 2007—a measure of the change in their competitiveness in the years before the crisis—against recent interest rate spreads. Again there is a fairly strong relationship. Thus, one concern

in sovereign debt markets may be that some countries simply face very bad growth dynamics in the near future. They have borrowed too much, whether in the public or the private sector, and are not cost competitive with the rest of the currency union. Their slow growth is seen in their high unemployment and suggests that without a very low interest rate, their debt burden is likely to grow.

With only 12 countries under study, it is difficult to meaningfully test whether the problem that the current account demonstrates is a loss of competitiveness or simply a preference for borrowing; large current account deficits are consistent with either. But one can say that the current account balance in 2007 appears to be the variable most closely connected to current spreads: it has high statistical significance, has the most explanatory power, and retains significance even when other variables are included with it in the regression.¹⁶ Figure 8 thus suggests that the current sovereign debt crisis may have as much to do with weak growth and problems in the private sector as with fiscal irresponsibility. Certainly the irresponsible fiscal policies in Greece played a major role in its fiscal crisis, but not every country in the euro area should be viewed through this lens.

POLICY RESPONSE: INTERNAL DEVALUATION As already noted, solving the growth crisis in the GIIPS will require some sort of shift in demand toward them. But the euro area has surrendered the classic means of adjusting to shocks that differ across countries—a change in exchange rates—without replacing it with other means of adjustment. Emphasis has recently been placed on the need for deficit countries to have an “internal devaluation,” that is, for the prices of their goods and services to fall relative to prices in other countries, without a nominal depreciation.¹⁷ Both theory

16. If one includes debt in 2010 (or 2007) and the current account balance in 2007 in a regression on the spread over German interest rates, one finds that the coefficient on debt is not significantly different from zero but that the coefficient on the current account balance is statistically significantly different from zero at the 99 percent level (results not shown). The simple regression with these two explanatory variables explains roughly 80 percent of the variation in spreads. Dropping the debt level variable reduces the explanatory power only slightly, to 0.76. Including the spread over German interest rates in 1993, to see whether some countries have simply never been trusted by the market, does not reduce the explanatory power of the 2007 current account balance. Attinasi, Checherita-Westphal, and Nickel (2010) examine the initial widening of spreads and find both bank bailouts and projected deficits to be related to rising spreads. They use the current budget deficit forecast, which is affected by economic conditions, and do not examine the current account or the precrisis fiscal balance.

17. See for example, Åslund (2010). See Roubini (2011b) for a skeptical view about the viability of such a path.

and evidence, however, suggest that such a policy may be a difficult road for the euro area to follow.

Internal devaluation (or revaluation) is likely to be more complicated and more difficult than a simple change in the exchange rate. This, after all, is the original argument in favor of flexible exchange rates running back to Milton Friedman (1953): why change thousands of wage and price contracts when one can simply change the exchange rate? Furthermore, economic theory—especially that of a Keynesian or New Keynesian bent—suggests an explanation of why an internal revaluation should be easier than an internal devaluation: it is often more difficult and costly to adjust prices down than up. In particular, a result long accepted in macroeconomics is that wages are difficult to adjust downward. (See Akerlof, Dickens, and Perry 1996 for a discussion, and Barattieri, Basu, and Gottschalk 2010 for recent evidence on wage rigidity and downward inflexibility.) Thus, unless prices are rising quickly in a country's trading partners, an internal devaluation may be slow and costly to achieve.

One can evaluate the possibility of an internal devaluation in a number of ways. First, one can examine how often countries experience a real depreciation (domestic prices falling relative to prices in world markets) without a nominal depreciation (the domestic currency getting cheaper on world markets). In a recent paper (Shambaugh 2012), I use narrow trade-weighted exchange rate indexes from the Bank for International Settlements for a sample of 26 mostly developed countries stretching back to 1964.¹⁸ If one defines an internal devaluation as a change in the real exchange rate, without a similar move in the nominal exchange rate, of at least 3 percent in 1 year (or, alternatively, as at least a 5 percent change over 3 years or a 7 percent change over 5 years), then in this sample there have been 25 internal devaluations at the 1-year horizon, 26 at the 3-year horizon and 17 at the 5-year horizon (these 68 episodes are spread across

18. Looking at much wider indexes introduces potential problems. Even in a geometric index, a hyperinflation can generate an outsized weight in the calculations. Thus, broad trade-weighted indexes that include countries that went through hyperinflations may generate gaps between the nominal and the real exchange rate index for any partner country if the price level and the exchange rate do not move in perfect lockstep from month to month or year to year in the hyperinflation countries. Also, these indexes use consumer prices to generate real exchange rates. One could instead use export prices, but if a country is a price taker in export markets, then even if its prices rise, its export prices may not. Instead, less cost effective firms may simply stop exporting, thus reducing quantities rather than raising prices for the country as a whole. For this reason and for comparability to U.S. city prices, this paper uses consumer price-based measures.

Table 1. Internal Devaluations and Devaluations within Currency Unions

No. of episodes meeting criterion

<i>Sample</i>	<i>Criterion for devaluation</i>		
	<i>3% over 1 year</i>	<i>5% over 3 years</i>	<i>7% over 5 years</i>
<i>26 mostly developed countries</i>			
Internal devaluations only, ^a since 1964	25	26	17
Internal devaluations only, after 1990	3	6	3
All devaluations, since 1964	255	136	90
All devaluations, after 1990	114	57	44
<i>Members of currency unions</i>			
U.S. metro areas, since 1961	7	11	11
U.S. metro areas, after 1990	0	1	1
Euro-area countries, since 1999	1	1	1

Sources: Bank for International Settlements, Bureau of Labor Statistics, Eurostat, and author's calculations.

a. An internal devaluation is a fall in a country's overall price level relative to world prices that is not accompanied by a nominal depreciation of that country's currency. See text for details.

roughly half the countries in the sample).¹⁹ Nearly all of these episodes, however, happened in the era of generalized higher inflation before 1991 (table 1).²⁰ When world prices are rising by 10 percent a year, a country can have a substantial real depreciation simply by having lower (but still positive) inflation than its trading partners. Domestic prices and wages then do not need to fall for domestic goods and labor to become relatively cheaper on world markets. Moreover, although not reported in the table, internal revaluations, where prices increase faster than in trading partners, are roughly twice as common as internal devaluations.

Since 1990 there have been, broadly speaking, only three examples of an internal devaluation in my sample. One was in Hong Kong in the early 2000s, when a drop in demand for Hong Kong's goods and services

19. Technically, the requirement is that a country depreciate in real terms by at least 3 percent, that it depreciate at least 3 percentage points more in real than in nominal terms, and that its currency not weaken substantially in nominal terms. Thus, a 3 percent real depreciation combined with a 2 percent nominal depreciation would not count (the gap is too small), nor would a 15 percent real depreciation with a 12 percent nominal depreciation, as the bulk of the adjustment is coming from the nominal exchange rate.

20. After 1990, average developed-country inflation remains below 5 percent a year. One can also shift the date back to 1986 with little change in the results, as inflation was below 5 percent for most of 1986–90 as well.

following the merger with China led to a fall in prices while the nominal exchange rate remained pegged to the U.S. dollar. Another was in Japan in the late 1990s and early 2000s, when domestic prices were falling but the yen was relatively constant in value or depreciating slowly. The third is in Ireland during the current crisis, where wages and prices have fallen while the euro has remained relatively constant in value. In the different categories of 1-, 3-, and 5-year devaluations, sometimes one of these episodes shows up more than once (for example, three of the 3-year periods are part of a sustained shift in Japan), making the actual count greater than three, and in some cases, one of these episodes does not qualify: no single year in Japan's deflation reaches a 3 percent real depreciation; the three 1-year episodes are in Hong Kong (twice) and Ireland, but no episode shows up outside of these three. Moreover, Latvia is not in the sample, but its recent experience would qualify, as it experienced a real depreciation of 7 percent from 2009 to 2010 while the currency fell in nominal terms by just 3 percent. Because it had appreciated in 2009, Latvia's real exchange rate is now just slightly below its 2008 level.²¹

In contrast, real depreciations associated with changes in the nominal exchange rate in the same direction are common both before and after 1990. As table 1 also shows, there have been over 250 episodes of 1-year real depreciation if one does not constrain the depreciation to be an internal one; this is 10 times the number seen if the depreciation must come only through prices. Similarly, there have been over 100 real depreciations at the 3-year horizon and 90 at the 5-year horizon. At all three horizons, depreciations after 1990 are also plentiful. This is not to suggest that all these changes in the real exchange rate were needed or desired, but simply that real depreciation stemming from a nominal exchange rate change is a much more common phenomenon.

It may be that a nominal depreciation is simply a path of least resistance compared with an internal devaluation, and internal devaluations are still quite feasible. That is, in many cases where a nominal depreciation generated a real depreciation, perhaps a real depreciation would have occurred even if the exchange rate had been fixed. One can turn to within-currency-union price evidence to see whether there have been substantial relative price adjustments. Again, the evidence is not encouraging for countries hoping to pursue this strategy.

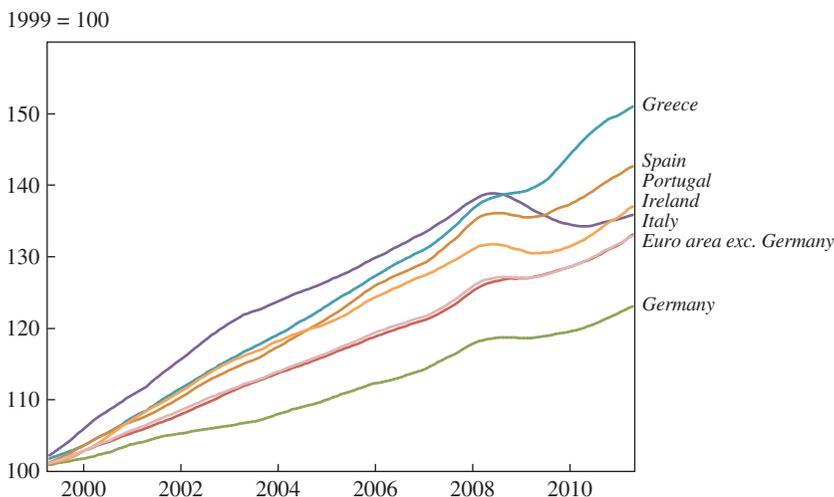
21. Other Baltic nations pursued policies aimed at exchange rate stability and price adjustment, but none had sufficient changes in prices to be considered an internal devaluation.

In Shambaugh (2012) I use price data for 27 U.S. metropolitan areas from 1961 to 2010 (data for some of these are unavailable in the early years of the sample) to see whether individual metro areas can have falling prices relative to the rest of the U.S. currency union.²² I use the same standards for an internal devaluation as in the cross-country analysis above but compare the inflation rate in each metro area with the median inflation rate for the nation across these metro areas. The results, reported in the bottom panel of table 1, show that in the United States, internal devaluations did occur before 1991, but rarely, and with two exceptions, none have occurred during the period of lower inflation since 1990.²³ (Annual U.S. inflation averaged over 6 percent from 1968 to 1990 but 2.6 percent from 1991 to 2010.) Nor were there any internal devaluations in the period 1961–67, when inflation averaged just 1.7 percent. If nominal devaluations are a path of least resistance in adjustment between currency areas, labor mobility may serve the same function within the United States, promoting adjustment across regions in lieu of an internal devaluation.

Finally, one can look at relative prices within the euro area since its launch, comparing inflation in each country with that in the median across countries. Since the euro area's inception in 1999, only Ireland's experience after 2008, mentioned above, qualifies as a substantial internal devaluation. An interesting case where internal devaluation, as defined above, did *not* occur is Germany's experience in the 2000s. Much discussion of current imbalances focuses on Germany's dramatic shift from slow growth and balanced trade in 1999 to better economic performance and a sizable trade surplus by 2006. The bottom-right-hand panel of figure 8 shows that Germany had the second-lowest inflation in the euro area from 2001 to 2007, suggesting that its relative prices were falling. But several other countries are clustered fairly close to Germany, so that Germany's gain in price competitiveness relative to these must have been slight. Figure 9 shows trends in price levels in the GIIPS, Germany, France, and the euro area outside of Germany since the euro's inception. Certainly the GIIPS—and especially Greece and Spain—have lost competitiveness relative to the euro area as a whole, and relative to Germany in particular. But Germany

22. See Obstfeld and Peri (1998) for a review of the literature on interregional price variability. This section differs by focusing on the frequency of internal devaluation as opposed to the general level of variability.

23. The two cases are Denver over the 3 years ending in 2004 and Honolulu over the 5 years ending in 1999.

Figure 9. Overall Price Indexes in Euro-Area Countries, 1999–2011^a

Source: Eurostat.

a. Rolling 12-month averages of harmonized consumer price indexes.

has gained only a modest amount of competitiveness against the euro area overall.²⁴ Its principal gains are against the outliers. This, in a sense, is the corollary of all the other results. Internal devaluations tend to be successful only against a backdrop of higher inflation elsewhere.

These results suggest that a rapid, substantial shift in relative prices through wage or price compression in the GIIPS countries is unlikely in the present crisis. Some GIIPS countries have lost considerable cost competitiveness in the last decade. Since 1999, Greek prices have risen roughly 30 percent relative to German prices, and 20 percent relative to prices in the euro area outside of Germany. The comparable figures for Spain are 20 percent and 10 percent, respectively. For Greece to regain its lost competitiveness at a rate of 5 percent every 3 years would thus require roughly a decade of internal devaluation. Further, the three internal devaluations

24. There were some 3-year periods where Germany gained 3 percent against the euro-area median, and some 5-year periods where it gained 5 percent, but never more. The total gain from 1999 to 2011 was 8 percent. Finland is the only other country in the euro area to have met the 5-percent-in-5-years hurdle.

that have been observed in the period of generally low inflation since 1990 (as well as that of Latvia, which is not in the data set) have tended to occur in the midst of a severe recession or depression. Unemployment rates increased substantially, and nominal GDP stayed flat or declined for a number of years; this was not true on average for internal devaluations before 1990. One should not attribute the economic weakness in these cases to the internal devaluation; the important point is that these devaluations tend not to happen absent severe economic contractions, with unemployment substantially above trend.²⁵

An internal devaluation comes with one further challenge. If wages and prices fall, then even if there is real GDP growth, nominal GDP could fall, which means that the denominator in the debt-to-GDP ratio does not grow. The fact that Japan's nominal GDP was the same in 2010 as it was in 1992, despite cumulative real GDP growth of 16 percent over that period, is one reason that its debt-to-GDP ratio has climbed so much. Thus, even if the GIIPS countries were to restart real growth through internal devaluation, only after they restart nominal growth would that help their debt sustainability. The IMF's end-of-2011 report on Greece (IMF 2011b) is not overly optimistic about the pace of Greek internal devaluation, calling for 1 percent a year for 10 years. Such a pace seems reasonable based on past evidence unless inflation increases in the rest of Europe, but it also suggests that Greece will not regain competitiveness for many years and will likely not see substantial nominal GDP growth for a number of years, implying continued strains on solvency.

In many ways, these results are simply an extension of earlier analysis by Michael Mussa (1986), who found that in floating exchange rate environments, real and nominal exchange rates tended to track one another closely. The results presented here suggest two corollaries. First, deviations from Mussa's finding, of the type where a real depreciation occurs (domestic prices fall relative to foreign prices) absent a nominal depreciation, are extremely rare in a low-inflation environment. Second, those deviations tend to be accompanied by extreme economic dislocation. Also, Blanchard and Pierre Alain Muet (1993) note that although attempts to bring down inflation can stop real appreciations against trading partners in a fixed

25. Current account balances in Latvia and Ireland have returned to positive, but it is unclear whether one should credit their more competitive relative prices or their massive declines in imports, as consumption is down substantially in both countries. See Darvas (2011).

exchange rate regime, generating substantially lower inflation to create a real devaluation can be quite difficult, and nominal exchange rate changes appear to have much lower costs.

The important implication for euro-area policy is that to increase the odds of a successful internal devaluation by the GIIPS, it would be very helpful if inflation in the rest of the euro area were running faster than the 2 percent annual rate to which the ECB is committed for the euro area as a whole. At the very least, if inflation is to stay close to zero in the GIIPS, it must be allowed to run somewhere above 2 percent in the core countries, so that the overall average is 2 percent. The GIIPS countries account for roughly one-third of euro-area GDP, so if their inflation rate is 1 percent, inflation in the rest of the euro area would have to be no higher than 2.5 percent to achieve a 2 percent overall target, leaving a gap of only 1.5 percent a year. If the GIIPS had zero inflation, the rest of the currency union could have 3 percent inflation and still hit the target. A likely easier way to achieve the same 3-percentage-point spread would be to have 1 percent inflation in the GIIPS countries and 4 percent inflation in the rest of the euro area, but that would lead to inflation of 3 percent in the euro area overall. Although such an outcome would violate the ECB's goal of 2 percent inflation in the short term, it would likely facilitate relative price changes as well as faster nominal GDP growth throughout the euro area and a likely depreciation of the euro overall.

POLICY RESPONSE: STRUCTURAL GROWTH POLICIES Internal devaluation is not the only route of adjustment that the GIIPS are being encouraged to take to restore growth. A second is structural reform. This might include deregulating product or retail markets, streamlining rules for investment or starting businesses, implementing policies that foster innovation, or removing barriers to entry in various services professions. Policies to make labor markets more flexible might help either increase productivity or lower wages, leading to lower production costs. Any of these reforms that succeed in increasing growth could help achieve debt sustainability and lower unemployment. There are a number of concerns, however. Structural reforms may take time to implement and may generate temporary dislocations as workers shift from previously protected sectors. More important, if the economies are struggling from a lack of demand—with household balance sheets stressed and sovereigns that cannot spend—improving potential output through structural reform may not lift them out of recession. Thus, structural reforms may help in the long run, but not at present. This does not mean that such reforms should be ignored; on the contrary, they are likely to be good policy, but they may not be sufficient to deliver these

economies from their current slump. Indeed, some theory (see, for example, Eggertsson 2011) suggests that if a country is in a liquidity trap, increasing aggregate supply will be counterproductive, as output is demand determined and increasing supply will just lower prices. If a structural reform increases expectations of future growth sufficiently, it might increase consumption through the change in expected lifetime income, but this may depend on those consumers' ability to borrow. Reforms such as these have been included in the terms of the aid packages negotiated thus far. They obviously have not, however, delivered rapid near-term growth in the face of budget cuts and tax increases.

Evidence on the impact of structural reform in the short term is limited. In a series of studies, researchers at the Organisation for Economic Co-operation and Development (OECD) suggest that over a long horizon, countries with poor structural policies could raise their potential GDP through such reform (see OECD 2012 for a discussion). Their results suggest, however, that the impact in the near term is likely to be limited. Policies that spend government funds to help unemployed workers find work (active labor market policies) may lower unemployment but are unlikely to be pursued in the face of austerity. Further, many policies that seek to remove labor market rigidities appear to have limited impact in the first few years. Thus, although structural reforms would likely help over time and should be pursued as part of a long-run package, both theory and the limited available evidence on their efficacy are uncertain and do not offer encouragement that these reforms can be a route to a near-term resolution to the growth crisis.

II.B. The Impact of the Sovereign Debt Crisis on Banks

As the crisis has worn on, the initial concern about exposure of euro-area banks to bad assets based on U.S. mortgages has broadened. In particular, a crucial question for these banks has become their exposure to the bonds of their own governments. (Exposure to local real estate markets is also an issue in countries that had large real estate bubbles, such as Ireland and Spain.) European banks hold large amounts of euro-area sovereign debt on their balance sheets.²⁶ Stress tests have been conducted on 91 large

26. The reasons for these holdings are beyond the scope of this paper. Some may be due to pressure from governments on banks within their jurisdiction to buy their debt. In other cases they may be a response to regulatory incentives: in regulatory frameworks that weight assets by risk for purposes of determining capital requirements, highly rated government debt typically counts as essentially riskless and hence does not require a large capital buffer. See Euro-nomics (2011) for a discussion.

European banks (discussed later),²⁷ and the results indicate that Greek commercial banks hold roughly the equivalent of 25 percent of Greek GDP in the form of Greek government bonds. Spanish banks hold local sovereign debt equivalent to roughly 20 percent of Spain's GDP; the comparable figures for Italian and Portuguese banks are closer to 10 percent. Further, banks in these countries hold considerable volumes of bonds of other European sovereigns, so that their total exposure to stressed sovereigns is even higher. Banks in other euro-area countries also have sizable exposure: banks in France and Germany hold roughly the equivalent of 5 percent of their respective countries' GDP in the sovereign debt of the GIIPS countries.

The IMF (2011b) estimates that in the largest Greek banks, holdings of Greek sovereign debt exceed 100 percent of core tier 1 capital (equity and retained earnings, essentially the cushion that a bank has to face losses before liabilities exceed assets) and are over 500 percent in some cases. The OECD recently calculated that bank holdings of Belgian, Italian, and Spanish debt summed to well over 100 percent of core tier 1 bank capital in each of those three countries, and to over 50 percent in France and Germany (OECD 2011). If the value of just some of these assets were set to zero, it would effectively wipe out the capital of these banks, making them insolvent. Although the value of any sovereign bond is unlikely to fall to zero, the threat of a significant markdown helps explain why euro-area banks have faced funding problems in recent months. Viral Acharya, Itamar Drechsler, and Philipp Schnabl (2011) demonstrate that the cost of insuring bank bonds varies with the cost of insuring the sovereign debt that those banks hold. That is, increased risk of sovereign default is directly translated in the market into increased risk of bank default.²⁸

POLICY RESPONSE: STRESS TESTS One way to resolve the uncertainty over banks' balance sheets that can lead to liquidity pressure is to subject them to rigorous stress tests designed to explore their solvency under a wide

27. See Kirkegaard (2010) for a spreadsheet that compiles the sovereign debt holdings of the 91 tested banks by country from the July 2010 stress tests. This is an underestimate of the total holdings of the banking system, as it adds up only the holdings of the major banks, not the entire system. Information made public in December 2011 indicates that some banks had shed sovereign debt exposure by the end of the third quarter of 2011. Conversely, since the long-term refinancing operations in December and February (discussed below), there is evidence that euro-area banks have increased their holdings (see "Sovereign Bond Market Gorges Itself on ECB Christmas Present," *Wall Street Journal*, December 20, 2011), making a precise estimate difficult until new official figures are released.

28. Demirgüç-Kunt and Huizinga (2010) suggest another reason for the comovement. As sovereigns become more stressed, the market may fear that large financial institutions are too big for the weakened state to save in the event of a crisis, and thus the banks are viewed as more risky.

variety of assumptions. Both the U.S. financial regulatory authorities and their European counterparts have performed a number of such tests of their respective banks. A difficulty for the European authorities, however, is that the test of greatest interest to the market involves precisely the scenario that the authorities have promised to avoid: an unruly default by a sovereign. Furthermore, the stress tests of U.S. banks helped in part because they resolved uncertainty, but also in part because there was a committed public capital backstop in case the tests revealed capital shortfalls. In the euro-area tests, the only backstop was at the national level, meaning a bank that could go bankrupt because of default by its sovereign had to rely on that same sovereign (which, again, cannot provide liquidity by printing its own currency) for any capital backstop. This complication, together with other problems of implementation, has meant that the possibility of bank insolvency has not been ruled out. Furthermore, the most recent tests suggest that the banking system needs in excess of €100 billion in additional capital. Given this scenario, liquidity problems for the banks have necessarily continued to fester.

POLICY RESPONSE: LIQUIDITY PROVISION In response to additional funding problems at banks in the fall of 2011, the ECB has provided liquidity. As part of a long-term refinancing operation (LTRO) in December 2011, the ECB provided nearly €500 billion of long-term (up to 3 years) credit at low interest rates to ease banks' funding crunch. A second LTRO on February 29, 2012, provided over €500 billion more. In some cases this liquidity simply replaces other, shorter-term liquidity that is expiring, but the net effect is still substantial. Banks were increasingly facing pressure on their ability to secure funds during the fall of 2011. As figure 3 shows, interbank spreads were again widening, not to post-Lehman panic levels, but still enough to signal distress in funding markets. The surge in liquidity from the central bank seems to have at least provisionally calmed this problem, as the spreads are heading back down.

An important aspect of this policy is that the ECB did not merely increase liquidity by buying assets to expand its balance sheet, nor did it lend to banks on a short-run basis. By lending for terms of up to 3 years, the ECB filled a liquidity need of the banks, but relative to a policy of purchasing assets from the market, it has not removed credit risk from bank balance sheets.²⁹ The ECB's policy with regard to direct purchase of sovereign

29. The ECB does not itself avoid the risk. If a Spanish default made some collateral posted by a Spanish bank to the ECB suddenly worthless, the Spanish bank would be responsible, but in that circumstance it would almost certainly be bankrupt as well. Thus, the bank still faces risk, but so does the ECB. If instead the ECB bought the debt directly, only it and not the bank would face risk.

debt has slowly shifted, however, and it now holds over €200 billion of such debt purchased under the Securities Market Program. In this program, begun in May 2010, the ECB purchases public and private debt securities in secondary markets. The program built up slowly, and by the end of 2010 the ECB held just over €70 billion in assets. This contrasts sharply with the Federal Reserve's purchase of over \$1 trillion in mortgage-backed securities by early 2010. The Federal Reserve went much further to withdraw assets from the market that the private sector viewed with suspicion. The ECB, in a May 2010 press release, maintained that the purpose of its program is simply to smooth troubled markets and ensure that the monetary policy transmission mechanism is functional.

Furthermore, although the LTRO may have been a crucial solution to banks' liquidity problems, if the banks used those funds to make still more sovereign debt purchases, then the connection between banks and sovereigns has merely been strengthened as banks hold even more sovereign debt. In that sense, the LTRO is notably different from the quantitative easing policies of the Federal Reserve, where the Fed purchased assets outright rather than help fund banks' ability to purchase them.

II.C. The Impact of the Bank Crisis on the Sovereign Debt Crisis

Beyond the initial liquidity crunch, many euro-area banks faced solvency problems, and national governments across the euro area stepped in to provide banks under their jurisdiction with funds or guarantees. Unlike the liquidity concerns, which have been understood to be a supranational issue to be addressed by the ECB, bank solvency concerns have been treated as a national matter. The European Commission and the ECB helped play a coordinating role as various EU nations grappled with banking solvency issues, but the plans—and most importantly their funding—came from the member states.

POLICY RESPONSE: NATIONAL BANK SUPPORT As documented by Ana Petrovic and Ralf Tutsch (2009), nearly every euro-area country took some steps involving the use of fiscal resources to stabilize its banking system. These included direct injection of capital into the banks (in 10 of 15 euro-area members in 2009) and state guarantees of bank liabilities (in 12 out of 15), as well as loans to the banking sector, acquisition of bad assets, nationalization of some firms, and individual rescues. The tools used varied, but the national nature of the response did not.

By mid-2010, total commitments (from capital injections to liability guarantees) ranged from roughly 20 percent to over 300 percent of GDP across euro-area countries (with the exception of Malta and Slovakia,

which had provided no formal support at that point; Stolz and Wedow 2010). The IMF (2011a) estimates that total direct support to the financial sector by mid-2011 (not including liability guarantees, which may or may not cost the governments money in the future) amounted to roughly 6 percent of GDP in countries such as Greece and Belgium, 13 to 14 percent in the Netherlands and Germany, and as high as 41 percent in Ireland. Some of this money will be repaid, but in some cases the costs could go higher. The bailout of Anglo Irish Bank alone has cost the Irish government roughly €25 billion. By mid-2011 the government had already contributed over €40 billion in capital to the banks and was planning substantially more (see Acharya and others 2011 and Lane 2011 for discussions). Well before that, however, it had become clear that Ireland could not come up with all the needed funding itself, and the European Union provided a loan of €85 billion in the fall of 2010 (sovereign bailouts are discussed in the next section). Despite the loan, Ireland remains directly responsible for paying for the bank bailout. Ireland's leaders have called on the wider European Union to share the burden, however, arguing that the banking system is euro-area wide and that both borrowing and lending countries should shoulder responsibility for troubled institutions.³⁰

This reliance on the government of the member state where the bank is located to fund its bailout stands in contrast to policy in the United States, where the specific state location is not the determinant of who bears costs. Both bank support—for example, through the Federal Deposit Insurance Corporation (FDIC) or, in the case of capital injections, through the Troubled Asset Relief Program—and most bank regulation take place at the national level (which in the United States is also the currency union level). If arrangements in the United States were similar to those in the euro area, then, for example, the state of Washington would have had to bear the fiscal burden when Washington Mutual collapsed with nearly \$200 billion in deposits. There is no way it could have borne the cost. In that instance, the FDIC was able to broker a deal with JP Morgan Chase and avoid any fiscal cost, but again, if left to the state level, it seems quite possible that such an arrangement would have been difficult. Alternatively, a currency union-wide fund might have lent the state of Washington the financing if necessary, but state taxpayers would have been responsible for any funding thus provided. The mutualization of bank losses across states can reasonably be achieved, of course, only if there is area-wide supervision and area-wide

30. See Lane (2011) and O'Rourke (2011) for discussion of the terms of the Irish bailout and the ways in which it has left Ireland with an extensive burden.

provision of resources, such as is done in the United States through the FDIC. But although banks in Europe were operating across national borders, and with the same currency and same lender of last resort, they were subject to different supervisory authorities and lacked any mutual bank support across countries.

The cost of the bailouts in the euro area has had a serious impact on sovereigns' ability to repay their own debt. This issue has already attracted detailed research into how sovereign debt and bank debt are related. When the rescue packages were put in place, the cost of insuring a bond against default fell sharply for banks, as they were now perceived as more safe (Esing and Lemke 2011, Acharya and others 2011). But at the same time, the correlation between the cost of insuring sovereign debt and general perceptions of financial risk in the world economy rose, as the national government was now responsible for financial losses in many countries (Esing and Lemke 2011). After the Anglo Irish Bank bailout, the loop was strengthened and financial sector stress was transmitted to sovereigns, but sovereign stress was also transmitted to the financial sector (Mody and Sandri 2012).

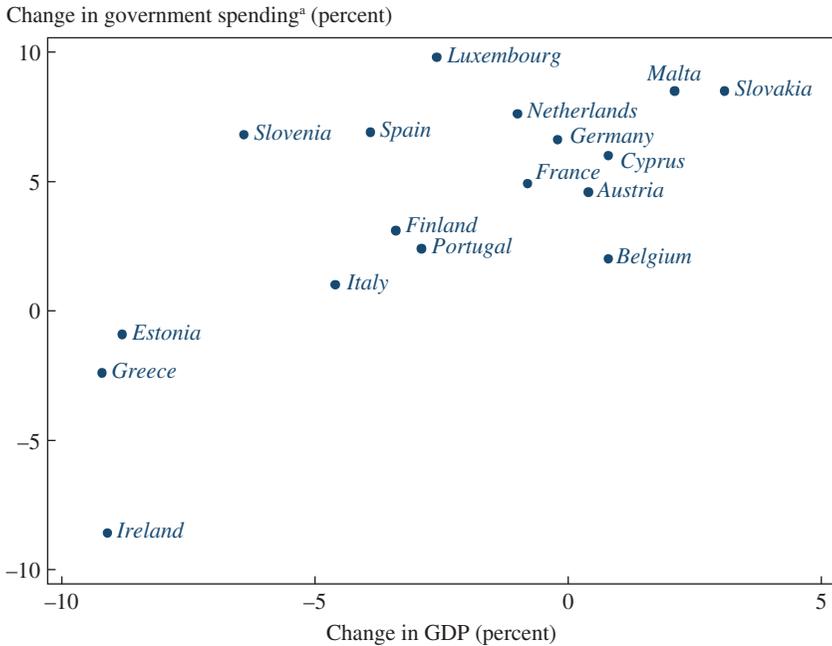
II.D. The Impact of the Sovereign Debt Crisis on Growth

The sovereign debt crisis makes slow growth a more pressing issue than it otherwise would be. One reason is that slow growth might be sustainable over a much longer period when debt levels are low than when they are high. But the primary impact of the sovereign debt crisis on the growth crisis comes directly from the chosen policy response to sovereign debt stress: austerity.

POLICY RESPONSE: AUSTERITY Austerity in the euro-area context means national austerity, in which countries cut their budgets to limit current and future deficit projections in an attempt to raise market confidence and lower interest rates. Some countries appeared to have had little choice in the matter. If the market would not lend, they could not borrow more, and thus they had to cut their deficits.³¹ Still, the early returns suggest that standard economic theory has held all too well. Contractionary fiscal policy is just that: contractionary. The countries undergoing stringent fiscal tightening have faced very slow growth. Further, contraction can wipe out the near-

31. It should be noted, however, that some countries—Italy in some projections and Greece quite likely starting in the near future—will soon be running primary surpluses, or at least will have achieved primary balance. Thus, all their new borrowing will go to pay off old loans coming due and to make interest payments. These countries do not need access to global capital markets to fund current operations.

Figure 10. Change in Government Spending and Change in GDP in Euro-Area Countries, 2008Q1–2011Q1



Source: Eurostat.

a. All changes are cumulative changes over the indicated period.

term budget savings as measured by the change in the debt-to-GDP ratio if austerity shrinks GDP by more than it cuts the deficit. In other words, policymakers’ attempts to solve the sovereign debt crisis not only may be making the growth crisis worse, but may be making the sovereign debt crisis itself worse as well.³²

Figure 10 plots, for the 17 current euro-area countries, the change in GDP from 2008Q1 to 2011Q1 against the change in government spending over the same period (see Paul Krugman’s blog entry cited in note 3 for a similar graph). The figure shows that economic activity is shrinking the most in the countries making the deepest budget cuts, enough to cause the debt-to-GDP ratio to rise even with the cuts. Obviously, these countries may be growing slowly for

32. Recent analysis by the IMF has emphasized that where austerity has been too severe and has slowed growth too much, markets have responded by further doubting sovereigns’ ability to repay (see Cottarelli 2012).

other reasons, but the evidence of this perverse impact of austerity runs deeper: recent analysis by the IMF (2010) shows that austerity has tended to generate contractions in GDP. Further, the United Kingdom, which was not undergoing the same kind of stress in financial markets and thus arguably had more choice about whether to engage in austerity, nonetheless did so and today is also struggling with very weak growth and high unemployment.

To avoid the possibility that these cuts in government spending are forced by falling revenue, and thus a consequence, not a cause, of the economic weakness, one can focus on cuts known to have been motivated by market demands for austerity. Such an analysis reveals no correlation between debt levels before the crisis and the change in government spending over the crisis—although this may explain the cuts in Greece and Italy. Interestingly, a very good predictor of current austerity is the interest rate on long-term debt back in 1993 (the first year of data in Eurostat). In other words, if markets were distrustful of a country two decades ago, it is likely that the same country is being forced to undergo austerity today, as the markets seem reluctant once again to lend.³³ Using the interest rate on long-term debt in 1993 to proxy for market distrust that is not connected to current macroeconomic outcomes, and using the ratio of bank assets to GDP before the crisis to proxy for potential bank bailout costs, in the analysis reported below I try to isolate the reductions in government spending that are not linked to current economic performance.

In both a simple bivariate ordinary least squares (OLS) regression of the change in GDP on the change in government spending (column 2-1 in table 2) and an instrumental variables (IV) regression (column 2-2) where the change in government spending is instrumented with the 1993 interest rate and the ratio of bank assets to GDP in 2007, the coefficient on the change in government spending is quite close to 1, and the hypothesis that the coefficient is zero can be rejected at the 99 percent confidence level; the coefficient in the IV regression is slightly higher than, but not statistically significantly different from, the OLS coefficient.³⁴ The sample is small, and it is possible that the instruments are not truly exogenous, as high interest rates in 1993 may have meant that the transition to the euro lowered

33. To include in the analysis newer entrants to the euro that do not have long-term interest rate data going back to the early 1990s, one can instead use the spread between their interest rates and that of Germany for the first year that such data are available in Eurostat. For the newer entrants, this is always at least 5 years before the country joined the euro.

34. Luxembourg is an extreme outlier with respect to bank assets as a share of GDP, so it is dropped from the regression. This leaves only 11 countries. Alternatively, one can use only the interest rate in 1993 as an instrument (dropping the 2007 bank assets-to-GDP

Table 2. Regressions Explaining Changes in GDP in Euro-Area Countries with Changes in Government Spending^a

<i>Independent variable</i>	<i>2-1</i>	<i>2-2</i>	<i>2-3</i>	<i>2-4</i>	<i>2-5</i>
Percent change in spending, 2008Q1–2011Q1	1.06*** (0.28)	1.19*** (0.29)	1.06*** (0.28)	0.80*** (0.19)	0.95*** (0.35)
Ratio of bank assets in 2007 to GDP (BA/GDP)				-0.014*** (0.004)	
Ratio of debt in 2007 to GDP (D/GDP)				-0.0006** (0.0003)	
Estimation method ^b	OLS	IV	IV	IV	IV
R ²	0.61	0.60	0.61	0.84	0.53
No. of observations	11	11	11	11	15
Instruments ^c		IR93 BA/GDP	IR93 BA/GDP D/GDP	IR93 BA/GDP D/GDP	First spread ^d BA/GDP

Source: Author’s regressions using data from Eurostat and the ECB.

a. Sample in columns 2-1 through 2-4 includes countries that joined the euro area before 2007. Sample in column 2-5 includes countries that joined the euro area before 2011 (only Estonia joined more recently). Data for Luxembourg are excluded from all columns because the country is an outlier with respect to the bank assets-to-GDP ratio. Standard errors are in parentheses. Asterisks indicate statistical significance at the ***99 percent or the **95 percent level.

b. OLS = ordinary least squares; IV = instrumental variables.

c. The *F* statistic for a regression of the percentage change in government spending on the three instruments in columns 2-2 through 2-4 is greater than 13. IR93 = interest rate on long-term government debt in 1993.

d. Spread of a country’s 10-year government bond rate over that on German 10-year government bonds in the first year that the country appears in Eurostat’s long-term bond data (to include new entrants).

ratio) and keep Luxembourg in the regression; the results are similar. One can also include the debt-to-GDP ratio in 2007 as a third instrument, again with similar results (column 2-3). Including newer entrants (see the previous footnote) generates nearly identical results and increases the sample size to 15 (column 2-4; data are still lacking for Estonia). In all of these cases, the coefficient on the change in government spending is statistically significantly different from zero at the 95 percent confidence level and is between 0.9 and 1.2. It weakens only slightly if the bank assets-to-GDP ratio or the debt-to-GDP ratio is included in the second stage. The results also hold if one includes inflation from 2001 to 2007 or the change in debt from 2001 to 2007 as independent variables. That is, current cuts to government spending appear to have a negative impact on growth even when one controls for loss of competitiveness before the crisis or excess spending before the crisis. Given that there are only 15 observations, one should not overemphasize the statistical properties of these tests. If both Ireland and Greece are excluded from the regressions, the results are no longer statistically significant.

interest rates and helped trigger a boom-bust cycle in housing. But this instrument is not a significant predictor of changes in output on its own, and some countries (such as Italy) had high interest rates in 1993, have austerity now, and yet did not experience a large housing bubble. Thus, the evidence is suggestive that the results of prior studies carry through to the current crisis: austerity comes with significant reductions to growth.

POLICY RESPONSE: BAILOUTS The supranational aspect of the policy response in the euro area has been to try to remove market pressure by making loans to countries after they announce budget consolidation plans. An emergency European Financial Stabilization Fund (EFSF) was created but was initially somewhat limited in size and scope (it has been expanded and made permanent with the European Stability Mechanism, ESM). The limits are emblematic of the political difficulties that a lack of EU-wide institutions can present. The politics of shared burdens or of injecting capital into banks are often difficult, and trying to get the parliaments of 17 nations to ratify a change is immensely so.

Whatever the reason for its limits, the EFSF has acted only to stave off sovereign insolvency. As of March 2012 the EFSF, in concert with the IMF, had already provided funds to Greece, Ireland, and Portugal to prevent their disorderly default. Subsequently, the “troika” (the IMF, the European Commission, and the ECB) have acknowledged that Greece will be unable to pay all its debts and have crafted a restructuring that imposes losses on the private sector holders of Greece’s debt. The programs surrounding the bailouts have involved a wide array of austerity measures and structural reforms. A typical IMF program often comes when a currency devaluation has taken place (or will take place). In those cases, acute competitiveness problems may have been solved through the exchange rate change (at least temporarily). Further, the central bank of the country in question is often asked to take what is viewed as more appropriate policy. Yet these programs in euro-area countries have not asked for changes to ECB policy, nor have they solved countries’ short-run competitiveness problems through other means.

Nor has the EFSF mutualized bank losses in a way that would break the link between sovereigns and banks.³⁵ As already noted, the EFSF was unable or unwilling to provide capital directly to Ireland’s banks, but instead provided loans to the Irish government, which then provided funds to the

35. In a recent speech, IMF Managing Director Christine Lagarde (2012) has suggested that some method to mutualize bank losses would be helpful, but that is not the current policy of the EFSF.

banks. Thus, with the exception of limited aid, restoring bank solvency is still a national matter.

Unlike the supranational response to the liquidity problems of banks, which at times has been quite strong, the response to liquidity problems on the part of the sovereigns has been partial and inconsistent. The EFSF has provided funds, but it is too small to be a lender of last resort: such an institution must have sufficient funds, or the ability to create such funds, to clearly demonstrate an ability to lend without limit, so that the market withdraws liquidity pressure and the crisis is averted. The ECB has bought bonds so as to drive interest rates down, but it has been adamant that it will not act as a lender of last resort to sovereigns and is merely smoothing market fluctuations to aid in the transmission of monetary policy.³⁶ Instead, the approach has been to use a combination of austerity and the EFSF to deal with the solvency crisis and hope that, by proving solvency, the liquidity problems will ease.³⁷

Such an approach is sensible, however, only if the problem is one of insolvency caused by fiscal profligacy—that is, by large primary deficits. If the problem instead has arisen from too-high interest rates or too-slow growth, different solutions are likely warranted. If the problem is a self-fulfilling crisis where liquidity shortages lead to interest rate increases that in turn lead to solvency problems, the current policy has not been appropriate. The amount of money provided has always been finite.

Furthermore, when spreads spiked again in November 2011, the response this time came primarily by way of the LTRO (discussed above). Although the LTRO was explicitly targeted to the liquidity problems of banks, the increase in liquidity on longer terms made it profitable for banks to borrow cheaply from the ECB and then purchase bonds of relatively short duration that will be redeemed before the loan is due. Some policymakers were explicit in saying that they viewed this as a way to provide liquidity

36. See the ECB May 2010 press release as well as numerous interviews with current ECB President Mario Draghi, who has said that ECB purchases are “neither eternal, nor infinite” (see Lionel Barber and Ralph Atkins, “Mario Draghi: Charged to Save the Euro,” *Financial Times*, December 18, 2011). Although the ECB has bought debt in secondary markets, it is restricted in its ability to provide funds directly to sovereigns.

37. It should be noted that a lender of last resort can engender a moral hazard problem where actors are not fully responsible for their actions. If the ECB bought sovereign debt regardless of what a country did, the market signal would be removed, and sovereigns could borrow with impunity. Typically, at least with respect to the banking system, the lender of last resort has some supervisory power to prevent such actions, but the ECB has no such authority. Thus, it may fear that any actions to lower interest rates will be undone by increases in countries’ primary deficits.

to the sovereigns.³⁸ The impact of the LTRO and other actions to stem the crisis on yields is unmistakable. Yields on 2-year bonds fell from between 6 and 7 percent to under 3 percent for both Spain and Italy.³⁹ Ten-year yields also fell, but by much less. This process was still finite, and it was ad hoc in the sense that it did not directly provide liquidity to the sovereigns or purchase sovereign debt directly. Yields on Portuguese and Greek debt did not show the same direct responsiveness, as questions of solvency continue to dominate. (Portuguese 2-year yields fell beginning in late 2011, but the path has not been as smooth as in Spain and Italy.) Furthermore, the effects appear to have been temporary, as yields in Spain and Italy rose again in March 2012.

II.E. The Impact of the Banking Crisis on Growth

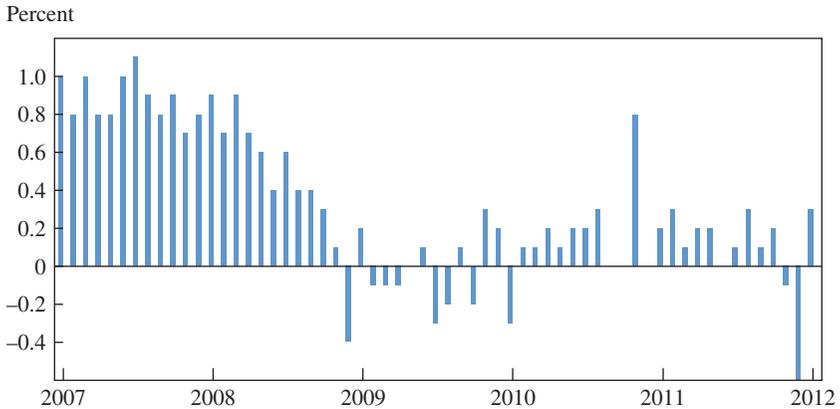
A weak banking sector is a continual drag on growth. If banks will not lend, that is one more factor preventing the euro-area economy from rebounding. The economics literature has long recognized the importance of the financial system for allocating capital toward productive uses and allowing firms and consumers to borrow. A rapid cut in the availability of credit will reduce both consumption and investment. Also, a weak banking sector can make any attempts at using monetary policy to stimulate the economy more difficult, as it compromises the credit channel of monetary policy transmission.

POLICY RESPONSE: INCREASING CAPITAL REQUIREMENTS In late 2011 the European Banking Authority increased capital requirements for banks to 9 percent. More capital means the banks have a larger cushion to withstand losses. A larger cushion should also make it easier for banks to borrow, as potential creditors have less fear of bank insolvency. However, banks can increase their capital ratio in either of two ways. They can raise capital in private markets, or they can sell off assets and pay down debt. To the extent banks use the latter channel, it means they will be less willing to lend and less willing to buy risky assets as they try to deleverage. This implies a contraction of credit to the broader economy and likely acts as a brake on growth.

38. The taking out of loans from the ECB to purchase sovereign debt was dubbed “the Sarkozy trade,” after French President Nicolas Sarkozy noted how the LTRO might support sovereign debt prices given the very attractive profit opportunity for banks. See, for example, the December 20, 2011, *Wall Street Journal* article cited above.

39. Yields began falling in advance of the LTRO as rumors picked up that there would be substantial intervention. See for example, Reuters, December 2, 2011, “Italian, Spanish yields fall on crisis moves.”

Figure 11. Monthly Change in Euro-Area Bank Loans to the Nonfinancial Private Sector, January 2007–January 2012



Source: ECB Monetary Statistics.

Evidence from loans to the nonfinancial sector at the end of 2011 is not encouraging. Loans to individuals and firms fell in November and December 2011 as banks struggled with both funding availability and the need to improve capital ratios (they bounced back in January 2012 following the December 2011 LTRO; see figure 11). A weakening economy would also lead to a decline in loan volume through a decrease in the demand for loans, so the observed decline in loans may not simply be due to a supply constraint. Surveys of lenders, however, show a tightening of credit standards for loans to nonfinancial corporations, consistent with bank funding problems, not economic conditions, being the driver of the reduction of credit. Also, there is evidence from the United States of foreign banks tightening loan standards by more than U.S. banks at the end of 2011; this was more likely a function of funding availability and attempts to deleverage than of decreased loan demand. The Federal Reserve's Senior Loan Officer Opinion Survey for January 2012 shows that foreign banks were tightening lending standards in the United States whereas U.S. banks were not. The same survey found that half of U.S. banks that compete with euro-area banks said they had experienced increased business due to a decline in competition from the euro-area banks during the crisis. Given the funding problems at banks, it may be that increasing their capital ratios was their only choice, but without robust measures to inject capital (in a way that does not stress sovereigns further), this policy may be acting as a

further impediment to growth. The small bounceback in lending following the LTRO is an encouraging sign that the LTRO may be helping prevent the banking system from choking off growth, but it is not a solution to the problem of recapitalizing banks. Such a recapitalization will be crucial to solving the current crises.

II.F. The Impact of Slow Growth on Banks

There are two key channels through which a weak economy can damage banks. One is simply that a weak economy means that more firms and households find themselves unable to repay their loans, thus increasing banks' losses. Similarly, asset prices typically decline in a weak economy, likely damaging banks' portfolios. But slow growth also harms banks through the linkage to sovereign debt. As discussed above, weak growth can generate problems for sovereign solvency, which in turn can damage the solvency of banks.

The various policy responses to the growth crisis discussed above—structural reforms to raise potential growth, internal devaluations, policies to stimulate demand—are unlikely to harm the banks and would eventually be good for them. The issue is whether growth can rebound sufficiently quickly in order to help the banks.

III. A Unified Policy Package

Many of the main policies pursued thus far in the euro area have been effective at treating the symptoms of one of the three crises, but often only temporarily or at the cost of worsening one or both of the other two. Austerity can cut deficits, but at the expense of growth. Locally funded bank bailouts can aid bank solvency, but at the expense of sovereign solvency. Increased bank capital requirements can calm fears of bank insolvency, but at the expense of lending and growth. EFSF bailouts have staved off disorderly defaults, but have done little to solve the fundamental issues. Finally, the LTRO can help relieve bank liquidity problems, but if banks use the funds to buy sovereign debt (and thus boost sovereign liquidity), the cost is a further strengthening of the bank-sovereign connection. Structural growth policies are likely part of a medium-run solution, but it seems overly optimistic to expect them to provide near-term help. The following sections suggest a series of policies that may work together as a more unified package addressing the entire set of crises.

III.A. Fiscal Devaluation to Reallocate Demand and Boost Competitiveness

Rather than wait for an internal devaluation to reallocate demand, countries can bring about the same impact through tax changes. Tax law changes can mimic the outcomes that a depreciation (or a tariff combined with export subsidies) would generate; this is sometimes referred to as a fiscal devaluation. Rather than hoping for wages to fall, governments could reduce taxes on labor. If they reduce payroll taxes on employers, they directly reduce unit labor costs. If they reduce payroll taxes on employees, they may encourage employees to accept a lower wage (or slower wage growth). At the same time, governments can increase taxes on consumption, both to balance the budget effect of the payroll tax cut and to discourage imports.

This policy option has received a fair amount of attention thus far in the crisis. Domingo Cavallo and Joaquín Cottani (2010) proposed it as a solution to Greece's competitiveness problems, and Ricardo Reis (2010) has made specific proposals for Portugal. Francesco Franco (2010) provides a more formal discussion for the case of Portugal, and Emmanuel Farhi, Gita Gopinath, and Oleg Itskokhi (2011) demonstrate in a general model that such a policy combination can generate economic outcomes similar to those from a currency devaluation. The IMF (2011a) has considered empirical evidence regarding the possible efficacy of fiscal devaluations and concluded that they can have significant effects.

Fiscal devaluation has been a widely debated part of the Portuguese adjustment plan, but as of this writing it has not yet been pursued.⁴⁰ Fiscal devaluation has been used to some extent in the past; Germany undertook a similar blend of policies in the 2000s, as did Denmark in the late 1980s. In some cases the changes in value added tax (VAT) rates required to fully offset the recent loss of competitiveness might exceed what is feasible, especially since increasing the VAT rate may encourage domestic buyers to shop in other countries. Still, even if fiscal devaluation cannot entirely solve today's competitiveness imbalances, it could make immediate headway.

If policies of fiscal devaluation were followed in the GIIPS countries in a coordinated fashion, and if the reverse policies were pursued in surplus countries such as Germany, the result could be a rebalancing of demand

40. See the weblog *The Portuguese Economy* (theportugueseconomy.blogspot.com/) for extensive discussion of the use of fiscal devaluation in the Portuguese plan.

across the euro area.⁴¹ This would aid growth but would not make either of the other crises worse. Furthermore, because a fiscal devaluation would work its effects quickly, it could be viewed as a complement to policies aimed at generating more growth in the long run.

III.B. Monetary Policy

Rather than—or in addition to—aiming at increasing long-run growth through changes in countries' structural policies, or attempting to reallocate demand through internal devaluation, the euro area as a whole could adopt additional monetary policy measures designed to spur growth overall. As noted earlier, the ECB was far less aggressive than the Federal Reserve (or the Bank of England) in expanding its balance sheet in the first years of the crisis, and in the spring and summer of 2011, the ECB actually raised interest rates out of fear of inflation. As those fears proved unwarranted and the euro-area economy overall worsened, those interest rate hikes have been reversed, but the ECB could try to do more to stimulate the economy. It has made a start by extending the LTRO, and as figure 4 demonstrates, the ECB's balance sheet has recently been growing rapidly. Thus, the ECB appears to be embarking on a course of more aggressive monetary policy. It could go further by increasing its asset purchases, to reduce the total volume of sovereign debt that the market must bear and to lower long-term interest rates in an attempt to spur growth. In addition to lowering interest rates, such a policy would likely depreciate the euro.

Also, by lifting its inflation target—or even by allowing some flexibility in the horizon over which it assesses price stability—the ECB might not only facilitate internal relative price shifts, as noted above, but also lift nominal GDP growth rates (important for debt sustainability, as argued earlier) and help the private sector deleverage. Kenneth Rogoff (2008) has advocated a burst of faster inflation in developed countries to help in this deleveraging, and Blanchard (2010) has advocated higher inflation targets to reduce the likelihood of central banks encountering the zero lower bound on interest rates.⁴² The findings discussed above on the difficulty of relative price shifts in a currency union with low inflation provide another rea-

41. Although a fiscal devaluation mimics a shift in relative prices, such a shift would not be apparent in comparisons of price levels. The reason is that VATs and other consumption taxes increase the measured price level. Because they are imposed on imports and refunded to exports, they can help dampen consumption and spur exports as a relative price shift would, but they do not lower the measured price level in the economy.

42. See Bernanke (2010) and Kohn (2010) for arguments as to why raising the inflation target may be problematic.

son for a higher inflation target in a currency union that lacks other shock absorbers to offset asymmetric shocks.

III.C. ECB Liquidity for Sovereigns

As part of its attempt to increase liquidity, the ECB could shift its policies with regard to its purchasing of sovereign debt in secondary markets. Rather than insisting that it will not serve as a lender of last resort, it could announce that for countries that are in good fiscal standing or that are participating in an EFSF or IMF package, it will keep long-term interest rates on those countries' sovereign bonds within a reasonable range. This might require a large-scale buying of bonds, but this would complement the use of expansionary monetary policy discussed above. The ECB has already pushed up against its legal constraints with its decision to purchase over €200 billion of sovereign debt. The question now is how much to buy and what communication policy should accompany those purchases. The ECB could also maximize, rather than undercut, its bond buying by making clear its goals for lower long-term bond yields. This policy—in contrast to one that only provides liquidity to banks—could also conceivably help reduce the bank-sovereign linkage by putting more sovereign debt on the ECB's balance sheet directly, as opposed to indirectly by accepting banks' posted collateral.⁴³

III.D. EFSF and ESM Capital for Banks to Break the Sovereign-Bank Link

As noted above, recapitalizing the banks is a crucial step in both stabilizing the banks and preventing a dangerous cycle of bank deleveraging. But relying on currently stressed sovereigns to provide the capital is problematic. Euro-area-wide policies to help recapitalize banks (perhaps using EFSF or ESM funds) could take pressure off the stressed sovereigns by removing the question of whether they will need to extend further bank bailouts; it would also help restart lending. Such a policy might entail moral hazard for national regulators if the funds were simply given to banks. However, if instead the funds were used to take equity positions in banks, then if a country's banking system were to become insolvent or to risk insolvency, the Europe-wide sponsoring of these capital injections

43. The seniority given to ECB holdings of Greek debt during the handling of Greece's debt workout raises complications. If the market now sees ECB purchases as shrinking the pool of bondholders who would bear the losses in a default, these purchases could conceivably become counterproductive. Thus, to be more effective, the ECB would have to make clear that it does not have seniority beyond that of other bondholders.

would mean that the banking system was increasingly owned by the euro-area governments as a whole. The punishment for mismanaging national banks would be that they would cease to be national banks. By recapitalizing the banks, rather than encouraging them to deleverage to reach their mandated capital ratios, this process should support growth while avoiding further pressure on the stressed sovereigns. The process could also be used to buy out the stakes of highly stressed sovereigns (such as Ireland), thereby reducing their debt-to-GDP ratios immediately.

III.E. Fiscal Expansion in Countries That Can Afford It

Finally, rather than simply reallocating demand across the euro area, countries could follow fiscal policies that would lift overall euro-area demand. With the currency area at risk of recession, the overall fiscal balance secure, and monetary policy close to the zero lower bound, theory would suggest that additional fiscal support for the economy is appropriate. But because the European Union and the euro area do not have substantial area-wide fiscal policies, the only fiscal policy option at present is for the nonstressed sovereigns to provide fiscal stimulus—or at the very least to slow their currently scheduled fiscal contractions. The IMF has repeatedly called for a measured exit from fiscal stimulus for those countries not under sovereign stress, to avoid negative spillovers from too many countries contracting at once. Increased fiscal support in the core countries could increase demand in these countries and, one hopes, have positive spillovers to their neighbors. Such policies would obviously not be as well targeted as what could be accomplished under a system that has fiscal offsets across countries, but could be helpful.

III.F. How the Policies Fit Together: Treating the Whole Patient

None of the policies discussed above is a silver bullet, but given that the euro area as a whole is likely headed into recession, it seems critically necessary to take any action possible—fiscal, bank recapitalization, or monetary—to lift growth across the euro area. Furthermore, the proposed policies do not undercut one another. ECB liquidity support for sovereigns can be part of monetary expansion. It would also free up funds at the EFSF to allow bank recapitalization. Fiscal devaluation in the stressed and fiscal stimulus in the nonstressed countries could help spur growth and improve its distribution, which should help both the sovereign debt crisis and the bank crisis; steps to lower interest rates for sovereigns and continue liquidity support to the banks should help as well. The euro area is in a difficult

position, but policy options are available that can move the currency union toward a better outcome.

IV. Institutional Changes

Finally, although it is beyond the scope of this already wide-ranging paper to describe in detail a package of institutional redesign for the euro area, some implications about institutional reform follow directly from the discussion above. First, it is not at all clear that a fiscal union focused on limiting deficit spending by individual countries (such as the compact currently being pursued) will improve outcomes in the euro area. The problems do not appear to be at root fiscal for a number of the countries currently under stress. Further, constraining fiscal policy limits the one avenue available to countries to cushion against temporary asymmetric shocks or smooth adjustment to permanent ones. It is not obvious that the often-heard claim that “a currency union requires a fiscal union” rings true. It does, however, appear that a currency union requires a financial union. This would involve two key changes.

First, to break the link from bank problems to sovereign stress, a euro-area-wide deposit insurance mechanism could be designed. Any safety net for a financial system requires offsetting regulation to combat moral hazard, and logically such regulation should be provided at the same level as the bank insurance. Thus, either the ECB or a euro-area-wide regulator would need to take a key role in bank supervision. Such a structure—along with a commitment that any bank bailout or recapitalization take place at the euro-area level—would remove the possibility of banks overwhelming sovereigns. It might also remove the temptation of local regulators to allow banks to take on too much risk or to force them to hold too much local sovereign debt.

To break the link from sovereigns to banks, however, another innovation is needed. The euro area lacks a common risk-free bond. This means that both the banks and the ECB must use the different member nations’ sovereign debt to stand in for a truly risk-free asset. The comparison with the United States is instructive. The Federal Reserve does not hold the debt of California or Illinois; it holds U.S. government debt, and state debt is not considered a risk-free asset. Thus, fiscal stress in states or municipalities does not threaten the Federal Reserve’s monetary policy or the national banking system.

In the euro area, two policy proposals to fill this gap have received attention. The first would distinguish between two types of sovereign bonds:

“blue bonds,” which would be mutually guaranteed by the entire euro area and could be issued by countries in amounts up to 60 percent of national GDP, and “red bonds,” which would be neither guaranteed nor subject to the 60 percent limit (see Delpla and von Weizsäcker 2010 for details). Thus, a country with debt equal to 75 percent of its GDP would have issued an amount equivalent to 60 percent of its GDP in blue bonds, which would be ultrasafe and low yielding (and could be held by banks as a safe asset and used by the ECB for monetary policy transactions), and the remaining debt equal to 15 percent of GDP would be in riskier, higher-yielding red bonds on which the issuer could default without broad repercussions for the rest of the euro area.

The second, alternative proposal is to create a debt agency that would buy up sovereign debt and issue its own debt in two tranches, one safe and one risky. This proposal could achieve the same goal of creating a risk-free bond, and it might use countries’ GDPs as a metric for determining how much of a country’s debt to buy. Such an institution might avoid some of the legal difficulties of mutually guaranteeing debt (Euro-nomics 2011). Under either proposal, the influence of sovereign debt on bank solvency could be greatly reduced, and the exposure of the euro area as a whole to sovereign stress in one or a few small countries might be lessened, as banks and the ECB could hold only the blue bonds or the safer tranche of debt agency bonds, leaving the other bonds as an explicitly risky class of assets.

IV. Conclusion

The euro area today is enmeshed in a set of overlapping crises that could threaten the very survival of the currency union. Banks are struggling, sovereigns are under strain, and the vision for how to generate enough growth in the periphery seems clouded. This is not to say that the euro area is doomed. As Eichengreen (2010) observes, the costs of dissolving the euro area are extremely high, and as many others have noted, the euro has always been a political, not a purely economic project. Time and again when the project has been threatened, leaders have come through with just enough to keep it going. Five years ago, hundreds of billions of euros in ECB bond purchases, hundreds of billions in balances in the TARGET2 system (the within-euro-area central bank transfer system), euro-area-wide stress tests and capital rules, and an emergency bailout fund of nearly €1 trillion would all have been unthinkable. It is possible that coordinated shifts in payroll and consumption taxes could aid the painful process of internal devaluation. The EFSF and the ESM could be used to capitalize

banks and to help break the sovereign-bank link. Fiscal support in the core countries could help spur growth. Finally, the ECB could provide liquidity to sovereigns and increase nominal GDP growth as well as allow slightly faster inflation to facilitate deleveraging and relative price adjustments across regions. All these steps, especially if taken together in an attempt to treat the three crises holistically, could substantially improve outcomes. At the same time, institutional reforms to create a true financial union and a common risk-free asset could help both solve the current problems and weaken the connections that led to the present crises. Of course, politics, ideology, or additional economic shocks could all hinder improvement. The euro area is highly vulnerable and without deft policy may continue in crisis for a considerable while longer.

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Comments and Discussion

COMMENT BY

RICARDO REIS The editors of this volume gave Jay Shambaugh a daunting task. The *Brookings Papers* has already published many articles—including two in this issue alone—on various aspects of the Great Recession in the United States, but Shambaugh's assignment was to produce, in a single paper, an account of everything that has happened in Europe over the last 3 years. Yet the European crisis is, both in its depth and in its consequences, more complex and, dare I say, more important for world affairs than the recent U.S. recession and its aftermath. It has led to faster increases in unemployment in some regions of Europe than in any U.S. state, and it has had impacts beyond the economic domain, enmeshing Europe's institutions and politics as well as its economies. Moreover, it is likely to lead to a very different Europe 5 years from now, whether as a more integrated union of states or as a more fragmented one, perhaps even without a common currency.

Rising to the challenge, Shambaugh provides a very readable summary of the euro crisis. Those in search of a bird's-eye view of the main features of the crisis and its policy debates will find it here. Necessarily, because so much ground is covered, the paper does not nail down any particular cause as the real driving force behind the crisis. Likewise, so many policy choices are discussed that none is definitely ruled out. But ruling out policy options, at least, was *not* part of his task, so he should not be criticized for that. I hope that over the next decade, researchers will use this paper as a starting point for taking one by one the many features of the crisis and exploring in depth what role it played.

As a discussant, it is my duty to alert the reader to some of the perils of such a comprehensive approach. I will do so in four ways. First, I will quarrel with Shambaugh's contention that any policy solution must address all

three of the euro's crises. Second, I will raise some doubts about whether there is a competitiveness problem behind the euro crisis. Having laid out some criticisms, I will then discuss some alternatives. In the third section, I will put forward an account of the crisis in which the movements in countries' current accounts and competitiveness are a consequence, not a cause, of the crisis. In the fourth section, I will propose a simpler policy solution. Both my story for the crisis and my solution may look incomplete relative to Shambaugh's broad survey, but they are consistent with most of the facts.

SHOCKS VERSUS PROPAGATION OF SHOCKS Imagine an academic economist just like Shambaugh, contemplating the crisis from an office thousands of miles away. But instead of picturing this scholar in Boston or Berkeley, imagine him (or her) sitting in Barcelona or Berlin and looking in amazement at the statistics on the U.S. economy since 2008. He would see that real GDP in the last quarter of 2011 was just 0.8 percent higher than in the last quarter of 2007, which included the last business cycle peak. He would conclude that the United States is suffering from a long recession, if not an output crisis. He would then observe that the civilian unemployment rate in that last quarter of 2011, at 8.5 percent, was not just well above the 5.0 percent recorded at the end of 2007, but also higher than at any time between 1983 and 2007. A labor market crisis would be the obvious diagnosis. Looking next at the federal balance sheet, he would see a dramatic debt crisis, with the public holding about \$10.5 trillion in government debt at the end of 2011, more than twice the approximately \$5.1 trillion held at the end of 2007. Finally, he would look at the balance of the current account and note that since 1982, the United States has run a deficit in every year but one, and that the deficit for 2011 was a staggering \$466 billion. Taking Shambaugh's comprehensive approach, the conclusion would be that the U.S. Great Recession is really four crises: in output, in labor markets, in sovereign debt, and in borrowing from abroad.

In this paper, Shambaugh's governing principle for evaluating policies is that any proposed policy that addresses only one or some of a set of simultaneous crises, while making any of the others worse, should be discarded. Looking at the above numbers for the United States with such a principle in mind, our European academic would immediately discard deficit spending as a worthwhile policy. Raising the U.S. public deficit would surely make the federal debt crisis worse, and it would likely increase the deficit on the current account as well. Our imaginary academic would be puzzled as to why there has been such a fervent debate about U.S. government spending in the past 2 years.

I hope this hypothetical exercise serves as a caveat to those readers who follow the U.S. economy closely but the euro crisis less so, alerting them to the dangers of a comprehensive approach. This way of looking at a crisis leads to a multiplication of possible subcrises that fails to distinguish between the original shock and how that shock propagated to other parts of the economy. It is common for a recession to lead to a fall in production and an increase in unemployment, but also to an increase in public debt through the automatic fiscal stabilizers, and to a current account deficit as the country borrows from abroad to smooth out the shocks. In a big recession, all of these responses will be more extreme. Nonetheless, there is still only *one* crisis, the recession itself.

Moreover, stabilization policy should not be confused with first-best economic policy. There may be many problems with the U.S. economy today, and they will surely take many different policies to address. Focusing on one of these problems, and thinking of policies to address it, is still a valid way to proceed, while also taking note of their effects on other sectors. Looking at the problem as a whole, policymakers will find that a combination of different policies is needed, but also that each of those policies, adopted to address one problem, may tend to make some other problems worse. And that is fine. In the U.S. case, it is perfectly valid to think of deficit spending as a way out of the recession, even though it increases the public debt, and even though other measures, such as entitlement reform, are needed to ensure the long-run solvency of the government. Because a menu of policies is needed, it would be unwise to reject any of the items on the menu because it alone does not solve the whole problem.

Shambaugh is right that fiscal austerity in Greece or Portugal will likely deepen the contraction in economic activity there. Yet in these two countries, where government spending has expanded continuously and rapidly as a percent of GDP over the last 20 years, where an aging population and a generous welfare state raise serious concerns about government solvency, and where private lenders are unwilling to extend 10-year loans to the government at rates below 10 percent, it is hard to see how some fiscal consolidation could be avoided. Fiscal austerity will not by itself end the crisis, but a moderate amount of it is probably part of the menu of optimal policies.

THE COMPETITIVENESS CRISIS The interaction between the sovereign debt crisis and the banking crisis has been part of the debate over the euro area's problems. Markus Brunnermeier and others (2011, p. 27) label this interaction the "diabolical loop," whereby concerns about the solvency of sovereigns fuel concerns about the solvency of banks, given their large holdings of government bonds, and these in turn confirm the concerns

about the sovereigns, given the likelihood that they will have to bail out their banking systems. Runs on the banks and on the sovereign debt market can then happen quite quickly, and indeed this explains the rapid run-up in yields in Greece, then Ireland, then Portugal, and now Spain.

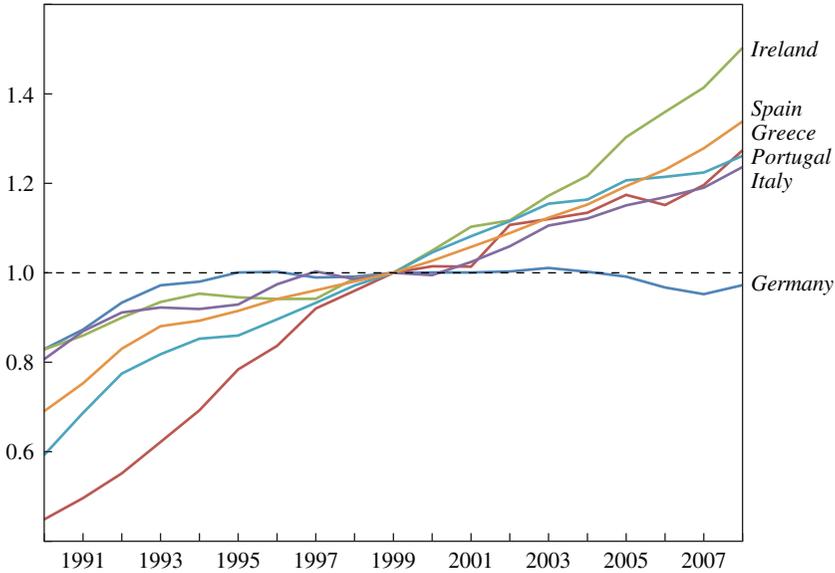
Shambaugh adds a competitiveness crisis to the mix and develops an interesting web of interaction between it and the other two elements. This is a very useful contribution to the debate, and the three-way interaction among sovereign debt, banks' balance sheets, and competitiveness should be further explored in future research. At the same time, however, I am skeptical about the role of competitiveness in the crisis, for two reasons. First, the justification commonly given to these competitiveness problems is the widening of the gap in unit labor costs between Germany and the crisis countries between 1999 and 2008. In those 9 years, unit labor costs fell by almost 3 percent in Germany, while increasing by almost 34 percent in Spain. A competitiveness crisis it seems indeed.

However, if one extends the comparison back in time for 10 more years (as in my figure 1), one sees that the faster relative increase in real unit labor costs in the crisis countries is there all along. It is hard to see any distinct break at the start of the century. Why, then, did this gap, which is at least two decades old, lead to a deep crisis only after 2008? Obviously, gaps in competitiveness between regions are an endemic and worrisome feature of the European Union. But it is less obvious that these gaps caused or even played a significant role in the crisis of the last few years.

Second, from the perspective of policy, a focus on competitiveness in Europe has its dangers. A driving force in the integration of Europe's periphery countries into the union has been the so-called structural and cohesion funds. These are investments funded at the EU level with the goal of developing infrastructure in the periphery countries or of raising their competitiveness in other ways. An important part of the discussion around the 1992 Maastricht Treaty, leading to the creation of the euro, was to stop the periphery countries from using periodic currency devaluations to mask competitiveness problems. Finally, the ambitious Lisbon agenda of 2000 set competitiveness as the European Union's main target over the next 20 years. It is only a slight exaggeration to say that competitiveness has been the main concern of European policymakers for the past 30 years. Thus, to suggest that lack of competitiveness is one of the main culprits of the current crisis gives the comforting, but dangerous and likely wrong, impression that European policymakers should do what they have been doing all along, just more of it and faster.

Figure 1. Unit Labor Costs in Selected European Countries, 1990–2008

Index, 1999 = 1.0

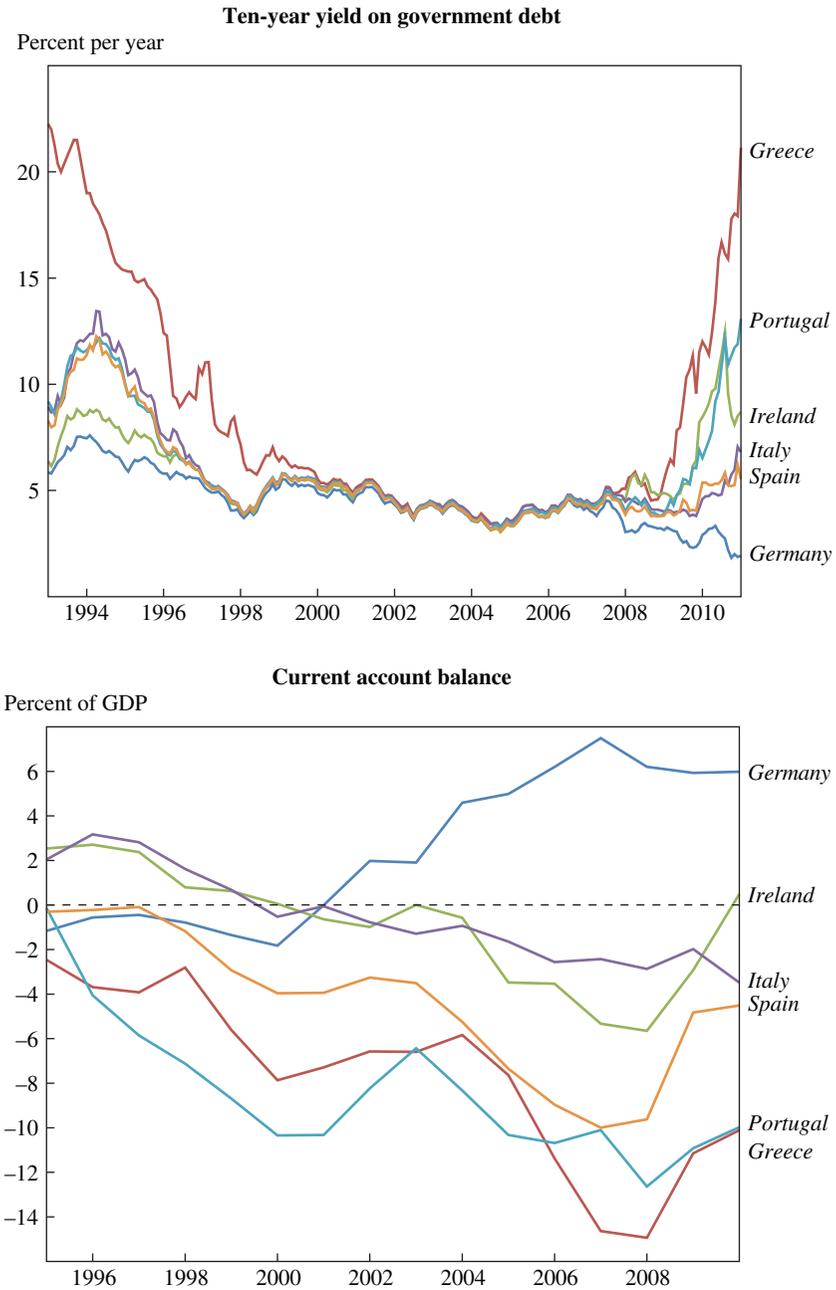


Source: Organisation for Economic Co-operation and Development.

COMPETITIVENESS AS CONSEQUENCE, NOT CAUSE As a contrast to Shambaugh’s comprehensive approach, let me offer a simple description of the crisis that is nonetheless powerful at accounting for the facts. This alternative story sees the crisis as an example of a “sudden stop” of lending as described in the work of Guillermo Calvo (1998, p. 36), and is partly shared with Lane (2012). The two parts of my figure 2 provide the main ingredients of this story.

The introduction of the euro removed exchange rate risk for Northern Europeans wanting to diversify their savings by investing part of those savings in the south of Europe. Perhaps there was some overoptimism, but whether the resulting boom in lending was justified or unjustified, interest rates across European countries all eventually came within less than 20 basis points of each other. Capital flowed steadily from north to south until in 2008 a world financial crisis led to a worldwide increase in risk premiums. Greece, Ireland, Portugal, and Spain, the recipients of these large inflows of capital in the years before, were now hit with a sudden stop. The institutional constraints and limited policy responses of the European

Figure 2. Interest Rates on Government Debt, 1993–2011, and Current Account Balances, 1995–2010, in Selected European Countries



Sources: European Central Bank and Organisation for Economic Co-operation and Development.

authorities in handling the crisis further fueled the perception of risk in the periphery and justified the rapid outflows of private capital *ex post*. The diabolical loop between banks and sovereigns then took over, leading to runs on these countries' sovereign debt and financial systems, and eventually to the need for public assistance from the International Monetary Fund and the European Commission.

In this account, the widening current account deficits in the periphery countries before 2008 are a reflection, not of lack of competitiveness, but of the direction of capital flows. It is hard to see any sudden changes in competitiveness in the crisis countries after 2008, but the sharp reversal in their current account deficits matches well the reversal of capital flows characteristic of a sudden stop. As for the real appreciation in the periphery before 2008, a capital flows-based story can again provide an explanation that does not involve competitiveness. As capital flowed to the periphery, it found its way to the nontradables sector (construction in Ireland and Spain comes to mind), pushing up prices and wages in that sector, and thus raising aggregate unit labor costs, as figure 1 showed. That this has implications for competitiveness is a consequence of the capital flows, not a cause of the crisis.

A FOCUSED POLICY ALTERNATIVE If, as I have argued, at the center of the euro crisis is not the problem of competitiveness, but rather the diabolical loop between banks and sovereign debt and the sudden stop in capital flows across regions, then a policy solution tailored to these problems emerges. To escape its crisis, Europe needs a Europe-wide safe asset. If banks held such an asset, the diabolical loop would be broken. If, in addition, there were a Europe-wide risky counterpart to this asset, then capital fleeing to safety, and capital in search of higher yield, would flow in opposite directions between these two assets, and not across geographical regions.

In joint work with a few colleagues (Brunnermeier and others forthcoming), I have shown how such an asset could be created without the need for joint and several liability of each European state for the other states' debts. Briefly, a European debt agency would buy a bundle of sovereign debt of each country in the euro area, allocated using some sort of fixed weights such as average GDP over the past 5 years. The flow of payments from this bundle would be used to create two securities: a European safe bond, which would be paid first, and a European junior bond, paid with the remainder. The debt agency would hold a modest amount of capital, and the safe bond would be a covered bond, so that if the payments from the bundle of sovereign bonds were not

enough to pay off the safe bonds, the capital of the debt agency would answer for the shortfall.

The diversification arising from this bundling of different countries' debt, the senior claim to payment from the bundle, and the buffer provided by the capital of the debt agency would, all three together, ensure that these safe bonds would be extremely safe. Banks would hold them to satisfy their need for safe assets, and because they would not be tied to any particular sovereign, the diabolical loop would be broken. Moreover, as periods of euphoria and flight to safety alternate in their usual fashion, they would trigger shifts of funds between the safe and the junior bond, without bringing about the collateral damage of current account deficits and sudden stops.

This policy proposal would not solve all the many problems of the European economies, nor would it automatically make those economies more productive, more efficient, or more competitive. But by breaking the diabolical loop and preventing sudden stops, it would go to the heart of what has driven the crisis of the last 2 years. It would greatly attenuate the recession, and it would stop the runs on sovereign debt and the sharp rise in yields in the periphery countries. The competitiveness problem, the reform of European institutions, and other structural reforms could then be dealt with at greater leisure, allowing them to be more carefully thought through.

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COMMENT BY

HÉLÈNE REY¹ In this paper Jay Shambaugh presents a clear and insightful overview of the euro crisis. He analyzes the lethal interplay among the fragility of the banking system, sovereign risk, and the lack of economic growth in euro-area economies. Obviously some perverse dynamics are

1. I thank Richard Portes for very helpful discussions.

at work. Weak banks hinder growth and put sovereign solvency at risk in extreme cases. Weak growth increases nonperforming loans and the debt burdens of sovereigns. Overindebted sovereigns cannot provide credible fiscal backstops for banks, further undermining financial stability. And so on. There is little doubt that such perverse mechanisms play a central role in explaining the depth of the crisis and the disastrous inability so far displayed by policymakers to stabilize the situation, for these three aspects have to be tackled jointly in order to get onto a path toward crisis resolution.

But how did the euro area get to this point? This question may be relevant in at least two respects. First, the root causes of the crisis may need to be identified so that the most effective policies to address the crisis in the short run can be put in place. Second, assuming the euro area survives, it is important to fix the structural flaws that led to this crisis, to ensure long-run sustainability.

Shambaugh's view is that the crisis can be largely ascribed to a deterioration of the competitiveness of the euro area's peripheral countries relative to the core. Greece, Ireland, Italy, Portugal, and Spain all saw their unit labor costs increase markedly relative to Germany's. This deterioration of competitiveness manifested itself in massive current account imbalances within the euro area, which were ultimately unsustainable. In a flexible exchange rate regime, such imbalances would correct themselves through nominal depreciations, which at least in the short run (through nominal price rigidity) would go hand in hand with real depreciations. In the absence of exchange rate flexibility, any real depreciation has to happen through relative price adjustment, a painful and long process when overall inflation is low. The current mandate of the European Central Bank (ECB) to maintain annual inflation at about 2 percent is not helpful in this respect. One of the paper's most striking graphs shows the high correlation across euro-area countries between spreads on 10-year sovereign bonds and external deficits. Although correlation is not causation, this indicates a strong association, at least in the eyes of the market, between the level of sovereign risk and external imbalances.² No such strong correlation can be found between debt-to-GDP ratios and spreads.

This view of the crisis as originating largely in differences in competitiveness certainly captures a good part of the macrodynamics between the core and the periphery of the euro area. It has the great merit of helping to

2. Lane and Milesi-Ferretti (2011) showed that the precrisis current account deficit and the rate of domestic credit expansion correlate with the decline in output in 2007–09.

dispel the erroneous but commonly held view that the roots of the crisis are to be found in the behavior of irresponsible and impecunious states in the periphery, whose public finances endangered the stability of the whole euro area. Except for Greece, whose public finances were clearly in shambles due in particular to the chronic inability of the Greek government to collect taxes, the periphery countries either had low debt-to-GDP ratios in 2007 (Spain and Ireland) or were steadily decreasing their debt-to-GDP ratios through primary surpluses (Italy) and were on a path toward fiscal consolidation, albeit a slow one.³ (The case of Portugal is less clear-cut.) An oft-cited fact is that France and Germany tended to have fiscal deficits *larger* than those of Spain and Ireland during 1999–2007, repeatedly breaching the 3 percent maximum set out in the 1997 Stability and Growth Pact.

This diagnosis leaves little doubt, in my view, that the austerity policies put in place to deal with the crisis are self-defeating. More fiscal austerity, and especially the generalized, front-loaded fiscal austerity undertaken in a number of the peripheral countries, means weaker economies and possibly increases rather than decreases in debt-to-GDP ratios.

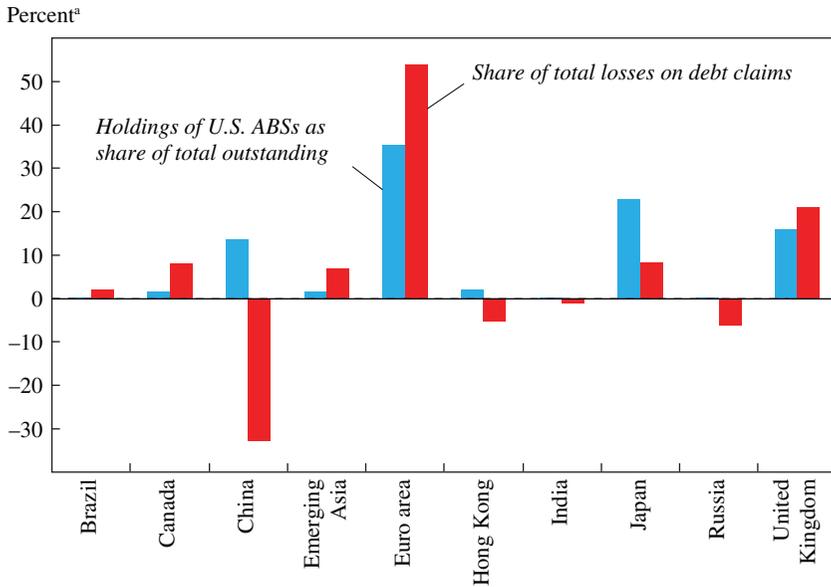
I will focus here on two issues: first, the role of banks, which, in my view, is not emphasized enough in the paper, and second, the links between the euro area and the rest of the world.

BANKS, CREDIT GROWTH, AND THE CRISIS Financial integration and excessive credit flows have played a central role in the crisis. The European banking sector has been weakened through its exposure to the U.S. financial crisis. As my figure 1 shows, countries in the euro area bought a large share of outstanding U.S. asset-backed securities and bore an even larger share of the losses in the rest of the world's debt claims against the United States. Cross-border financial flows slumped in 2008, after the bankruptcy of Lehman Brothers. Since the share of wholesale funding had increased on a large scale among euro-area banks in the years leading up to the crisis (see Giannone and others 2012), the drying up of short-term dollar funding, in particular of U.S. money market funds (McGuire and von Peter 2009), put the already weakened system under extreme stress. Euro-area countries such as Ireland that were heavily reliant on short-term international debt markets were disproportionately affected.

Within the euro area, credit growth to the private sector was particularly rapid during 2003–07. The initial lowering of interest rates in the periph-

3. As Lane (2012) has emphasized, however, a more prudent approach to risk management would have advised stronger fiscal tightening in a period of falling real interest rates, benign economic activity, and strong private sector leveraging.

Figure 1. Holdings of U.S. Asset-Backed Securities, 2007, and Shares of Losses on Debt Claims vis-à-vis the United States between 2007Q4 and 2008Q4



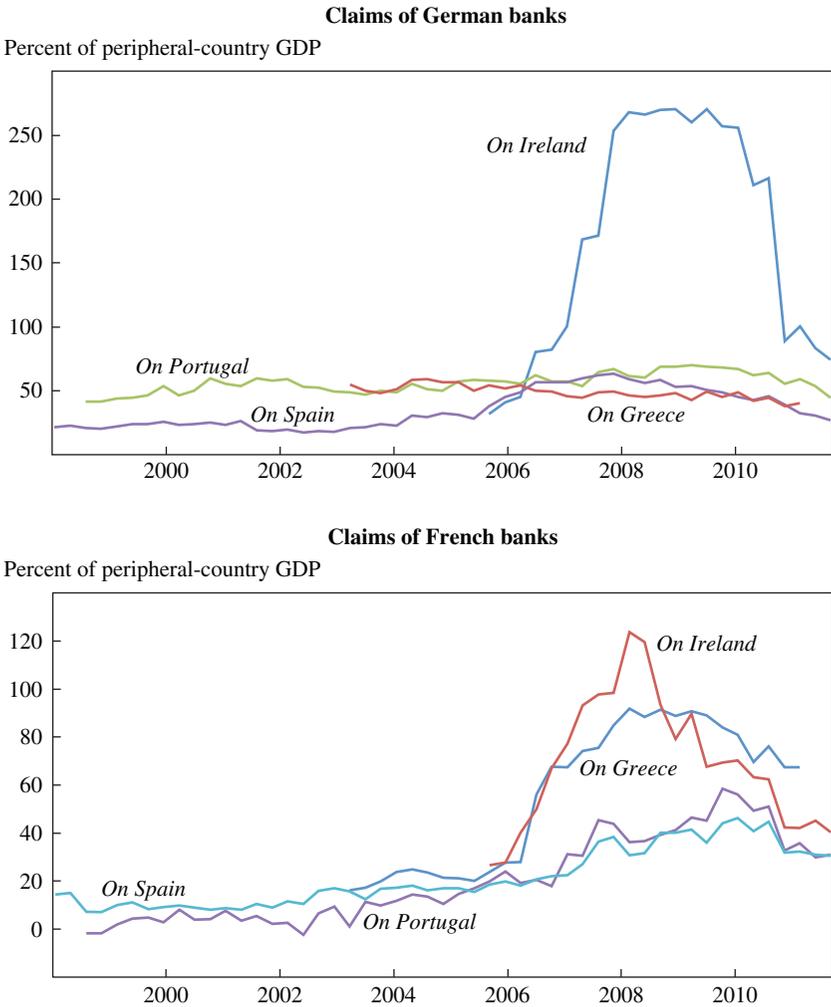
Source: Gourinchas, Rey, and Truempler (forthcoming).

a. A negative loss is a gain on external debt claims vis-à-vis the United States.

ery, as currency risk disappeared in 1999 with the birth of the euro, led to increases in borrowing for consumption and for purchases of real estate. But the general lowering of risk aversion in global markets from 2003 onward, together with the securitization boom, seems to explain a large part of the credit growth observed in the period immediately before the crisis (see Lane 2012). In Ireland and Spain, cross-border credit flows helped fuel real estate investment booms. In Ireland, property prices increased by about 30 percent between March 2005 and March 2007, according to data from the Bank for International Settlements. In Spain, regional banks (*cajas*) went on a lending spree in the local real estate market. As my figure 2 shows, net claims of German and French banks on Greece, Ireland, Portugal, and Spain amounted to large fractions of, and in some cases exceeded, GDP in the borrowing countries. An extreme case is Ireland in 2008, where net claims of German banks were an impressive 250 percent of Irish GDP, and those of French banks about 120 percent.

What happened next followed a scenario well known to economists familiar with crises in emerging markets with hard currency pegs. Massive

Figure 2. Net Consolidated Claims of German and French Banks on Countries in the Euro-Area Periphery, March 1999–September 2011



Source: Author's calculations using Bank for International Settlements data.

domestic credit growth and large cross-border banking flows, spurred by overoptimism or distortions in the domestic credit markets, led to real estate bubbles in these countries, which in turn translated into large real appreciations. As the returns to real estate-related activities increased while the bubble was inflating, more and more resources shifted into that sector, fueling the growth of the nontraded sector to the detriment of the manufacturing sector. As Olivier Blanchard (2007), among others, has pointed out, the increasing size of the nontraded sector draws resources away from industries that may have more scope for productivity growth, thus endangering the future growth of the economy. The boom in the nontraded sector in the European periphery bid up wages in the other sectors. Unit labor costs increased relative to those of the capital-exporting countries, especially Germany, eroding competitiveness in the periphery and widening intra-European imbalances. Ruo Chen, Gian Maria Milesi-Ferretti, and Thierry Tresselt (forthcoming) use data from the Klems database to show that annual real labor productivity growth in the manufacturing sector (excluding electrical goods) relative to the euro area declined during 2000–07 by an average of 2.9 percent in Greece and 2.6 percent in Portugal and Spain (it actually went up by 1.4 percent in Ireland). In 2007Q4, Spain had a current account deficit of about €28 billion (about 11 percent of GDP), while Germany had a current account surplus of about €54 billion (about 9 percent of its GDP).

The unfolding of events such as the Lehman failure in the fall of 2008 led to a major reassessment of risks, asset prices, and growth forecasts worldwide. For the periphery countries, the adjustment was especially brutal. The bursting of the real estate bubbles in Spain and Ireland led to major failures in their banking sectors and to a sharp downturn in real economic activity. Given the large size of the banks' balance sheets, their insolvency threatened the solvency of the sovereigns themselves.

This classic tale of excessive credit growth leads to some short-run policy prescriptions that are not dissimilar to those presented in the paper. Undoing the real appreciation in the peripheral countries to restore their competitiveness relative to Germany will require a combination of fiscal devaluation and a relative price adjustment, to be accompanied, if possible, by a higher inflation target for the ECB. I would add, however, that measures to render the nontraded sector in the periphery more competitive would be very helpful as well. On the financial side, delinking sovereign balance sheets from those of the banks, to prevent bank insolvency from leading to sovereign insolvency, would require much more aggressive intervention by the ECB in sovereign bond markets,

either directly or indirectly through the European Stability Mechanism (which should be given a banking license). It would also require some form of banking union with a euro-area-wide recapitalization fund for banks, hand in hand with the creation of a euro-area-wide banking supervisor.

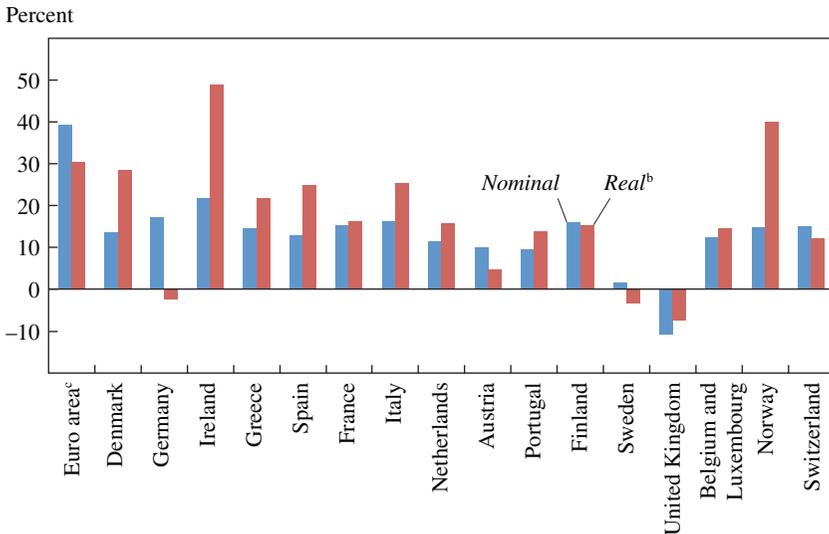
The above analysis suggests, however, that ensuring the future sustainability of the currency union also requires some important macroprudential measures. Together with a policy of fiscal tightening during booms, such measures should be able to keep credit growth in check and prevent the excessive real appreciations that are so difficult to undo in a currency union. Obviously, loan-to-value ratios, debt-to-income ratios, and other targeted macroprudential tools should be used aggressively, after domestic credit distortions such as debt- or mortgage-related subsidies have been removed. Moving toward a more centralized supervision structure within a euro-area-wide banking union should not only help in implementing these macroprudential policies more effectively but also improve the incentive structures of supervisors: local supervisors have adopted in the past a lenient approach toward local lending by regional banks such as the German *Landesbanken* and the Spanish *cajas*.

THE EURO AREA AND THE REST OF THE WORLD Shambaugh's paper tends to treat the euro area largely as a closed economy. It is not, of course. Although intra-euro-area flows dominate capital flows in Europe, the story on the trade side is different. According to Chen and others (forthcoming), more than half of Italian exports and of Greek exports in 2008–09 went to trade partners outside the euro area. Ireland trades much more with the rest of the world than with other euro-area countries. About 43 percent of Spain's exports, and 38 percent of Portugal's, are to countries outside the euro area.

Reflecting this openness to trade outside the euro area, movements in the real effective exchange rates of the euro-area periphery have been mostly dominated by fluctuations in nominal exchange rates, as my figure 3 shows (figures for other European countries are included for comparison).

Both real exchange rates calculated from unit labor costs and those derived from consumer price indexes (the latter are not shown) indicate a divergence between the periphery countries and Germany, but the data also show a substantial nominal appreciation of the euro against the euro area's trading partners during 2000–08. Looking forward, it seems plausible and indeed highly desirable that this nominal appreciation be reversed (and indeed that the euro depreciate further), so as to ease to some extent the path of adjustment for countries in the periphery.

Figure 3. Changes in Nominal and Real Effective Exchange Rates of European Countries, 2000–08^a



Source: Author's calculations using Eurostat data.

a. Effective exchange rates are calculated as a trade-weighted index of bilateral exchange rates with the country's or group's 24 most important trading partners outside the euro area. A positive value denotes an appreciation in terms of the home currency.

b. Calculated from unit labor costs.

c. Membership as of January 2001 (12 countries).

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GENERAL DISCUSSION Olivier Blanchard remarked that over the longer run of five to ten years, two of the three problems that Shambaugh had identified were, in principle, relatively easily solvable, but not the third. Europe's banks are slowly but steadily returning to health, and the links between sovereigns and the banks in their countries, which have so often led the former to bail out the latter, can be weakened through various measures. Thus, the bank solvency problem is one for which solutions are known to exist. The fiscal problem, too, is one that economists know how to solve. There are better and worse ways of addressing high government debt-to-GDP ratios—growing one's way out of the problem is better than allowing inflation—but countries did manage to reduce their debt ratios after World War II.

The competitiveness problem, Blanchard felt, was more worrisome, and he perceived it as having both trend and cyclical components: over time the differences in competitiveness between European countries were widening, and on top of that trend, the booms and busts in Portugal, Spain, and perhaps other countries had contributed to a real appreciation there, which in turn had produced large and persistent current account deficits in those countries. Even if savers elsewhere remained willing to lend to these countries, at some point the resulting debt had to be repaid. Meanwhile the presence of the boom-bust cycle meant that despite the real appreciation, external demand had to be found to substitute for shrinking domestic demand in these countries when the domestic economy cooled.

Douglas Elliott thought the paper did an excellent job of explaining the economics of the crisis but that some discussion of the political side was needed as well. Sovereign debt crises, after all, are profoundly political in nature and can have quite different outcomes depending both on political forces and on the kinds of political institutions in place—each of the recent emergency summits in Europe could easily have ended differently than it did. In particular, the fact that the euro-area countries in the aggregate are fiscally strong means that the issue is largely a political one of allocating the pain. This, in turn, raises issues of moral hazard, possibly calling for a game-theoretic analysis. Some further discussion of the role of the financial markets in amplifying or damping the crisis's dynamics would also be welcome, Elliott added. He thought that further bank deleveraging was more or less inevitable whatever else happened on the policy front.

Finally, Elliott suggested that the contrast between European and U.S. political relationships was not as great as the paper assumed. For example, although in the end the federal government did not bail out New York City in the 1970s, it came very close to doing so. Economic “war game” exer-

cises have been done in which a crisis in California was found to lead to its being rescued almost at the start.

Laurence Ball wondered why the solution to the peripheral countries' problem wasn't simply a fiscal devaluation. It seemed to him that whatever one thought was the source of the problem, given that countries within the euro area have no national currency to devalue, textbook economics indicated a straightforward case for fiscal devaluation.

Responding to Elliott, Martin Feldstein mentioned that his own recent article in *Foreign Affairs* treated the political dimension of the European crisis in more detail. He also thought the answer to Ball's question was likewise political: one can increase the value-added tax, as part of a fiscal devaluation, only if the unions in these highly unionized countries are willing to accept the resulting cut in real wages and do not try to raise nominal wages to compensate. Finally, Feldstein commented that the policy solution that Europe's leaders seemed to have converged upon, namely, a fiscal compact among countries to limit their budget deficits, bore an unfortunate resemblance to the Stability and Growth Pact of the 1990s and would likely, in his view, have the same outcome.

Martin Baily congratulated Shambaugh for providing a clear and coherent summary of the issues and noted that Shambaugh shared his own view that higher inflation in the core European countries was needed if the peripheral countries were to succeed in devaluing in real terms. Although to economists that seemed the obvious solution, assuming the euro area is to be kept intact, Baily had encountered strong opposition to the idea in discussions in Washington.

Baily also agreed with Elliott that much of what has been happening in Europe has a game-theoretic interpretation. For example, because the European Central Bank does not want to be seen as bailing countries out, its bailout of the banks can be viewed as largely an attempt to bail out the countries by the back door. The game being played is one in which each country—including the United States, which is a player through its stake in the International Monetary Fund—maneuvers to get the other countries to pay a larger share of the bill. All this maneuvering, unfortunately, is getting in the way of a permanent solution, Baily thought.

Although Baily regarded Germany as contributing to the impasse, he was also sympathetic to Germany's position that it should not accept an unwanted increase in inflation until the periphery countries took steps to control public sector corruption and shrink their bloated government payrolls. Noting that Paul Krugman has criticized the call for fiscal retrenchment in the periphery as an unjustified assault on the welfare state, Baily

argued that the reality was quite different: the main beneficiaries of fiscal profligacy in these countries are middle-class bureaucrats, not the poor and the needy. Responding to the observation that some of the periphery countries had had healthy fiscal balances before the crisis, and therefore were innocent of the charge of profligacy, Baily observed that those good fiscal results had largely been built on quicksand: much of the revenue in the boom years had come from the housing sector and vanished when the housing bubble burst. Some countries in addition had encouraged their financial sectors to take on the role of global bankers and were left with massive losses in that sector after the collapse. It was understandable that Germany would be reluctant to bail out its neighbors who had engaged in such behavior. All that said, it was clear to Baily that the core countries would eventually have to put up more money to prevent a general collapse.

Finally, responding to Feldstein, Baily suggested that the new fiscal pact was intended not so much as a solution to the continent's problems, but more as a way for the rest of the euro area to insulate itself from any defaults in the periphery. In his view, the pact was meant to ensure that if defaults did occur, the other countries would have the fiscal breathing space to absorb any effects on their own economies.

Frederic Mishkin felt that the banking crisis was the most important of the three crises, and that bank recapitalization was key to the solution. The case of Greece showed clearly that even a small country in a monetary union can cause large problems for banks throughout the union if it misbehaves badly enough. Mishkin also saw the Europeans as derelict in their duty for not undertaking something similar to the stress tests of banks that had been done in the United States. Those tests had proved crucial in resolving the U.S. financial crisis, because they not only revealed information about the banks but also forced them to return to health by recapitalizing, rather than by shrinking their assets and halting lending as was now happening in Europe.

Benjamin Friedman seconded a point made by Ricardo Reis, that the divergence of prices, wages, and unit labor costs within what is now the euro area had started long before the launch of the euro. Friedman's recollection was that many observers had expected the euro and its associated institutions to bring an end to that divergence, and he drew an analogy to the targeting of monetary aggregates under Paul Volcker's chairmanship of the Federal Reserve. Back then it was assumed that such targeting would bring an end to the divergence between M1 and other measures of money. Just as with the divergences in the euro area today, that did not happen, and the policy failed partly as a consequence.

Regarding the banking dimension of the crisis, Friedman thought the key question was whether the banks will be made to pay for their own mistakes. Although European banks may offer the excuse that they are effectively required to hold their own country's debt, they also chose to hold the debt of other countries, and there they erred badly. They also chose to hold real estate-backed securities and other assets that they had mispriced. Arguably, they should pay for that mistake by having to raise capital on unattractive terms, but for the most part that is not what is happening, at least not yet. These banks have a trillion euros of bonds maturing in 2012, at an average annual interest rate of 5 percent, and at the same time, and presumably not coincidentally, the European Central Bank is providing them with a trillion euros of financing at 1 percent—which amounts to a \$40 billion annual subsidy.

Jan Hatzius posed a question about the potential impact of a fiscal devaluation in Europe. Assuming a 25 to 30 percent gap in real exchange rates today between, say, Germany and the periphery, how much of that gap could fiscal devaluation realistically close?

Responding to the discussion, Jay Shambaugh began by addressing Hatzius's question. He thought that fiscal devaluation could close only a relatively modest part of the gap, and for that reason he argued in the paper that it should be done in a two-sided way, with Germany and other core countries undertaking the opposite policy, so as to maximize the effect. But a virtue of fiscal devaluation is that it can be done relatively quickly, and it was therefore worth doing even as a partial response.

On the competitiveness question, Shambaugh argued, agreeing with Blanchard, that growth is what matters, and when domestic demand is weak, competitiveness is what provides growth, allowing foreign demand to substitute for domestic demand. On H el ene Rey's point that the loss of competitiveness had occurred not only within the euro-area countries, Shambaugh replied that the market exchange rate of the euro is determined roughly according to the average degree of competitiveness across the member countries. Thus, higher inflation in Germany not only would help the periphery, by rebalancing relative prices within the euro area, but also would likely contribute to a depreciation of the euro overall and thus improve other member countries' competitiveness on world markets.

On the financial dimension of the crisis, Shambaugh agreed with Reis that an important institutional fix would be the creation of a European safe asset, but another, he believed, would be a mechanism that somehow breaks the link between sovereigns and their banks that today makes a limited taxpayer base responsible for bailing out a country's banks when

they get into trouble. Although he saw no evidence that a currency union necessarily requires a fiscal union, it seemed to him that it does require a financial union. It was simply not viable to have banks competing for deposits across an entire currency union, under different regulations and with differences in institutions such as deposit insurance in the different countries, while at the same time holding the taxpayers of a country solely responsible for those banks that happen to be headquartered within its borders.

