

June 11, 2010

Macroeconomic Consequences of a European Sovereign Debt Crisis¹

Introduction

A number of European countries are facing significant fiscal strains, and many governments have announced significant budget cuts.² At the same time, the outlook for European economic growth is weak, and some banks in the region are in a vulnerable state. Market participants appear extremely worried that these factors could prove mutually reinforcing, leading to financial dislocations and a sharp deterioration in economic conditions in Europe. If these fears were to intensify, they could become self-fulfilling and trigger a major financial and economic crisis (although such an outcome is not envisioned in the staff's baseline outlook). As recent events demonstrate, the fallout from such a crisis would almost certainly have effects beyond Europe. In this memo we use simulations of the staff's macroeconomic models to illustrate the potential consequences of such a tail event for Europe, the United States, and the rest of the world. Several points emerge from this analysis:

- The economic costs of a severe European debt crisis could be substantial, to the point of pushing not only Europe but also the United States back into recession.
- The vulnerability of the U.S. economy to a severe European debt crisis largely reflects potential financial spillovers; adverse effects arising through trade linkages alone would not be enough to trigger another U.S. recession.
- With policy rates already at very low levels in Europe and the United States, conventional monetary policy in these regions could do little to mitigate the effects of a crisis. Moreover, policy easing in other countries (where there is more scope for action) would exacerbate conditions on net in the United States by putting further upward pressure on the dollar.
- Given the troubled fiscal outlook for the United States, a crisis could conceivably lead to a questioning of the value of U.S. Treasury securities and dollar-denominated assets more broadly as safe havens. Although the likelihood of such a development seems remote, a loss of preferred status would exacerbate the effects of a European debt crisis on the United States.

An Illustrative European Debt Crisis

A European sovereign debt crisis could play out in many different ways, depending on the shocks triggering the crisis, the governments affected, and the extent of the repercussions on the financial system and the broader economy. These repercussions would likely manifest themselves within Europe in several ways, including large losses at major financial institutions, contagion effects that could disrupt the functioning of credit markets, higher risk premiums on private assets, depreciation of the euro and the currencies of other European countries, and a

¹ Chris Erceg, Jesper Linde and David Reifschneider of the Board staff contributed to this memo.

² These and related issues are discussed in the accompanying memo to the Committee, "The Fiscal Situation in the Advanced Foreign Economies", by Beth Anne Wilson, Carlos Artelt, Jasper Hoek, Robert Martin, and Trevor Reeve (June 11, 2010).

drop in household and business confidence. These developments would lead to declines in output and employment that in turn would feed back on government budgets and conditions in the financial system, exacerbating the crisis. Finally, the collective response of national governments to address the crisis would have an important bearing on its magnitude and duration.

For illustrative purposes, we consider a severe “tail-risk” scenario in which concerns about the solvency of European governments intensify sharply this summer. This development prompts an average increase in European sovereign debt yields of 150 basis points relative to the baseline forecast.³ To check the erosion in investor confidence, European governments enact spending cuts that go beyond the significant actions that have already been announced in some countries; these measures help forestall any additional rise in sovereign debt premiums. All told, government spending in Europe falls by 2 percent of GDP on average over the coming year on an ex ante basis relative to baseline.⁴ Thereafter, government spending remains persistently below baseline by this amount and thus significantly restrains aggregate demand.

Given the credit exposures of large European banks to debt of peripheral European countries and the weak state of the region’s economy, such a sovereign debt crisis would spark higher risk premiums on loans and private securities and a reduction in credit availability. In the scenario, we assume that corporate bond yields in Europe jump 275 basis points this summer and corporate equity prices plunge further, to a level 35 percent below baseline—a deterioration in credit conditions somewhat less extreme than that experienced by the United States in the fall of 2008. We also assume that reduced bank lending and declines in consumer and business confidence directly restrain consumption and investment. These effects on risk premiums, credit availability, and confidence are assumed to fade slowly over time, in part because the ECB and other central banks are eventually able to provide offsetting monetary stimulus.

An intensification of the European debt crisis would almost certainly further decrease investors’ willingness to hold assets denominated in euros, the British pound, and other European currencies relative to “safe” assets denominated in U.S. dollars. While such a flight to safety could exacerbate the funding problems of European financial institutions, the depreciation of the euro and the pound would likely work to mitigate the economic effects of the crisis within Europe by boosting net exports over time. Conversely, aggregate demand in countries experiencing currency appreciation, such as the United States, would be hurt. For illustrative purposes, we assume that the crisis initially causes exchange rates in Europe to depreciate further against the dollar, to a level 30 percent below baseline. (By comparison, the milder debt crisis that started late last year has lowered the value of the euro 25 percent since last fall.) Exchange rates thereafter slowly move back to baseline as the crisis abates.

³ This average change masks considerable heterogeneity across countries. By assumption, yields on German government bonds are unaffected by the crisis. In contrast, yields on sovereign debt jump more than 300 basis points for Greece, Portugal, Ireland, Spain, and Italy, 150 basis points in the United Kingdom, and by less than 100 basis points in France and other European economies. As a result of these movements, spreads on Greek sovereign debt would be back at the levels seen in early May, spreads for the other periphery countries would be near the current spread on Greek debt, and spreads on UK sovereign debt would be near the current spread on Spanish debt.

⁴ We assume that the extent of fiscal retrenchment varies across Europe. Specifically, government outlays in the periphery countries and in eastern Europe fall about 4 percent of GDP relative to baseline, while outlays in Germany, France, and Britain fall somewhat less than 1 percent on average.

According to the staff's multi-country DSGE model, SIGMA, such a combination of shocks would severely affect overall real activity and inflation in Europe (figure 1). The black lines report the baseline outlook as represented by a preliminary version of the staff's June Tealbook forecast, while the blue and red lines show simulated crisis conditions under different assumptions for financial spillover effects to the rest of the world. (These global spillover effects are discussed below.) As shown in the upper panel of figure 1, the crisis pushes Europe back into recession. In the absence of financial spillovers to the rest of the world, and thus a pronounced decline in activity outside of Europe, real GDP contracts 2¼ percent at an annual rate on average over the second half of this year and 2011 (blue line). The recession worsens noticeably, however, when global financial spillovers are factored into the analysis; the resultant sharper decline in real activity in the rest of the world, and hence weaker demand for European exports, causes real GDP to contract 4 percent at annual rate through the end of 2011 (red line). In this latter case, the cumulative weakness in real activity is enough to push the level of European output 10 percent below its potential by the end of next year, as compared to 5 percent in the staff baseline forecast. Under these conditions, consumer inflation temporarily falls below zero.

With policy rates in Europe already at their effective lower bounds, monetary policy is not able to provide conventional offsetting stimulus this year or next. But from 2012 on, monetary policy (following a Taylor-like rule) is able to keep short-term interest rates noticeably below baseline. Nevertheless, the expectation of this (delayed) monetary stimulus helps to put increasing downward pressure on long-term interest yields over time, thus boosting aggregate demand. In addition, increased fiscal discipline and the expected easing of monetary policy prompt a gradual decline in risk premiums and a restoration of confidence, thereby providing further support to real activity. As a result of these forces, a slow but steady recovery takes hold beginning in 2012.

Spillover Effects to the United States and Other Countries

The re-emergence of recession in Europe, coupled with a major depreciation of the euro and the British pound against the dollar, would noticeably affect the United States and other economies through standard trade linkages. As shown in the lower right panel of figure 1, net exports from Europe would rise considerably in the wake of the crisis; correspondingly, net exports from the United States and other countries would fall. As indicated by the blue lines of figure 2, SIGMA—run in tandem with the FRB/US model—predicts that such shifts in the international pattern of trade by themselves would be enough to slow the pace of the U.S. economic recovery.⁵ In particular, even though the simulation excludes financial market spillovers of the sort and magnitude experienced in recent weeks, the model predicts that U.S. real GDP growth over the second half of this year and in 2011 would be reduced 1¼ percentage point, on average, relative

⁵ To generate the results reported in figure 2, we first simulate the SIGMA model and then force the FRB/US model to replicate SIGMA's responses to the debt crisis shocks for factors such as domestic and foreign output, inflation, and interest rates. Because FRB/US has a more detailed treatment of the U.S. macroeconomy than SIGMA, this forcing step allows us to generate predictions for a wider range of factors. The adjustments to FRB/US required by this process are relatively modest because the two models have broadly similar dynamics.

to the preliminary Tealbook baseline. As a result, the unemployment rate would still be above 9 percent at the end of next year and core inflation would decline to $\frac{1}{4}$ percent.

Although these simulated effects are not minor, they likely understate the implications of a European debt crisis for the United States because SIGMA (like all existing models) does not fully account for the range of financial spillovers that could accompany such an event. To bring such extra-model global spillovers into the analysis, we ran a second simulation that layered on disturbances to financial conditions in the United States and the rest of the world. In spirit, these global financial shocks are similar to what Europe experienced during the U.S.-centered financial crisis of late 2008. Specifically, we assume that:

- Sovereign debt premiums outside Europe and the United States rise 100 basis points on average relative to baseline, reflecting increases of roughly 300 basis points in emerging market economies such as Brazil, and only small increases in advanced economies such as Canada, Japan, and Australia. In the United States, a “flight to safety” causes yields on long-term Treasury bonds to fall about 30 basis points relative to baseline.
- Risk spreads on corporate bonds and equity outside of Europe jump at the onset of the crisis, causing yields on BBB corporate bonds in the United States to increase more than a percentage point and equity prices to fall about 20 percent relative to baseline; such price movements would be somewhat smaller than those seen in Europe during the fall of 2008. We assume that the elevated risk premiums drift down over time as the crisis slowly abates.
- Consumer and business confidence falls in response to the crisis, directly restraining household and business spending. Over time, aggregate demand is also constrained by more restrictive credit conditions as banks tighten lending terms and standards in response to higher loan losses and the deterioration in the balance sheets of households and nonfinancial firms.⁶

The red line in figure 2 summarizes the implications of this scenario for the United States. With financial conditions having become so restrictive, the U.S. economy falls back into recession in the second half of this year and real GDP does not start expanding again until the second half of 2011. As a result, the unemployment rate peaks at just over 11 percent late next year and the high and persistent level of slack leads to a temporary period of deflation. Beyond 2011, the economy recovers gradually as the crisis abates and the FOMC keeps short-term interest rates at extremely low levels relative to baseline until the middle of the decade.

Outside Europe and the United States, the consequences of a debt crisis would likely be less severe because of greater scope for offsetting monetary policy action. Consistent with this greater freedom of action, policy rates on average in the rest of the world temporarily fall sharply below baseline by next year, making the decline in real output in these countries only half as great as it is in the United States. Much of this monetary buffering of real activity occurs through exchange rate effects, and so is partially at the expense of real activity in the United States and Europe. In particular, the monetary easing in the rest of the world causes the

⁶ Contributing to the deterioration in household balance sheets is an assumed decline in house prices that, relative to baseline, cumulates to 7 percent over the next few years.

currencies of these countries to depreciate 10 percent against the dollar; as a result, the broad real exchange rate for the United States increases more than 15 percent relative to baseline, as compared to only 10 percent in the absence of global financial spillovers.

Loss of Safe-Haven Status

As discussed in one of the accompanying memos, the fiscal outlook for the United States is troubling. Although we think the risk is remote, it is possible that under extreme conditions a foreign debt crisis could lead investors to reassess the value of U.S. Treasury securities and other dollar-denominated “safe” assets.⁷ Such concerns on the part of investors would likely be amplified by the implications for government borrowing of falling back into recession: In the scenario just discussed, the federal budget deficit (as measured in the National Income and Product Accounts) averages 10 percent of GDP from 2011 through 2013, as compared to 7 percent in the baseline. Loss of safe-haven status would cause U.S. Treasury yields to rise rather than fall in a crisis, thereby increasing the upward pressure on private long-term interest rates. Of course, a loss of safe-haven status would also imply less upward pressure on the foreign exchange value of the dollar, thus limiting the decline in net exports. But the net effect on the domestic economy would likely be contractionary.

To illustrate these risks, we consider a third scenario that differs from the previous one in the following ways:

- Rather than falling modestly, yields on 10-year Treasury bonds increase 150 basis points relative to baseline over the next several quarters as financial market participants see the federal budget deficit worsening markedly. This shift feeds through into other asset prices, and in conjunction with higher risk premiums, cause BBB corporate bond yields to increase 230 basis points and the stock market to fall 40 percent relative to baseline.
- Flight-to-safety pressures on the dollar are less intense and the euro and the British pound depreciate only half as much as previously assumed. As a result, the broad real exchange rate for the United States appreciates only 7½ percent relative to baseline.
- In response to weaker real activity and higher loan losses, lending standards and terms are assumed to tighten over the remainder of this year and through early 2012 by almost as much as occurred in 2007 and 2008.⁸

Figure 3 illustrates how these alternative assumptions would alter the effects of a debt crisis on the U.S. economy. As before, the black lines denote the preliminary June Tealbook baseline; the red lines repeat the previous simulation results in which the United States enjoys safe-haven status, while the blue lines report results for a simulation that incorporates the loss-of-status assumptions just discussed. For computational convenience, we generate the latter simulation using FRB/US alone instead of running SIGMA and FRBUS in tandem.⁹

⁷“The Long-Term Outlook for U.S. Fiscal Policy,” by Eric Engen, Glenn Follette, and David Lopez-Salido (June 11, 2010).

⁸ In part, this tightening reflects the scenario’s more pronounced decline in house prices, which are assumed to fall 14 percent below baseline over the next few years.

⁹ The simulation assumes that the loss in safe-haven status occurs gradually over the first few quarters, and with FRB/US it is easier to have agents gradually (rather than instantaneously) take on board the future implications of

In the new scenario, the loss of safe-haven status increases the depth and persistence of the recession that follows the debt crisis, mainly because it leads to much higher borrowing costs and lower equity values. For example, the unemployment rate peaks at almost 11¾ percent as compared to 11 percent when there is no loss in status. Inflation is not greatly affected by the loss of safe-haven status, partly because the dollar appreciates by less in these circumstances, reducing the disinflationary pressure from lower import prices. But these unwelcome disinflationary pressures are also limited and temporary because, by assumption, the debt crisis does not undermine confidence in the Federal Reserve's commitment and ability to restore long-run price stability. As a result, long-run inflation expectations remain firmly anchored despite the fact that the federal funds rate remains near zero into 2014.

The loss of safe-haven status also would worsen the fiscal situation: With interest expense up because of the rise in Treasury yields, the scenario shows the NIPA federal budget deficit swelling to 11½ percent of GDP in 2012. If these conditions led businesses and households to anticipate mounting political pressure on the FOMC to monetize the debt, then confidence in the Federal Reserve could decline and inflation expectations might rise. To illustrate this risk, we ran a final simulation that builds on the third by assuming that the crisis causes long-run inflation expectations to rise steadily over the next year and half (red lines of figure 4). The FOMC, seeing the gradual rise in expectations reflected in survey and financial market data even as the economy continues to contract, is assumed to depart from the Taylor-like policy rule and implement a gradual but steady policy tightening starting next year. This strategy causes long-run inflation expectations to peak at 3 percent in 2012 (more than a percentage point above baseline) and then to start to decline, checking the rise in actual inflation over the longer term. The cost of this policy, however, is an even slower recovery in real activity.

this shift. Note that in running this simulation, we first ensure that FRB/US replicates the SIGMA crisis results when the U.S. enjoys safe-haven status; we then apply the additional shocks that accompany the change in status.

Figure 1
Implications of a Severe European Debt Crisis for Europe

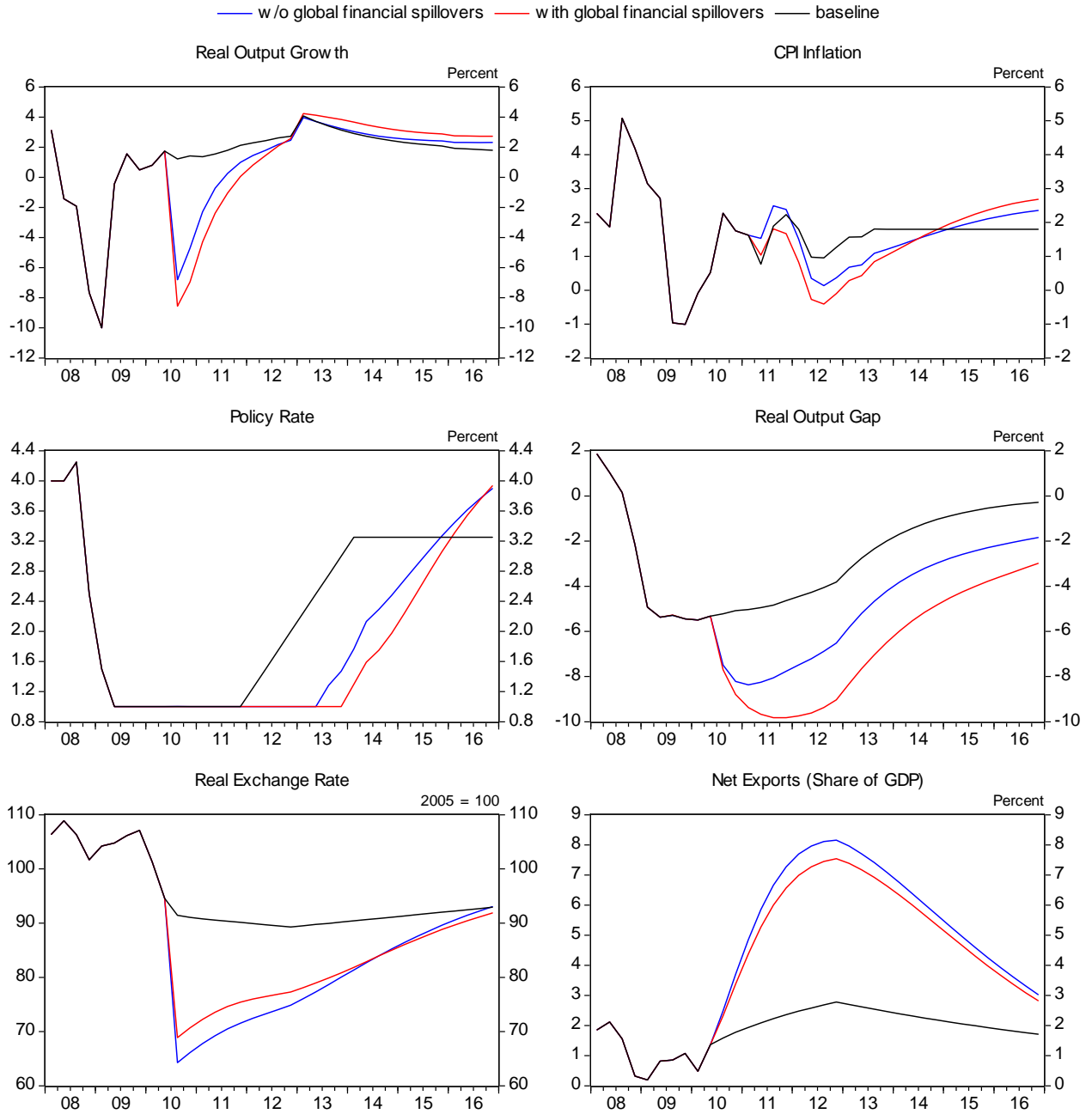


Figure 2
Implications of a Severe European Debt Crisis for the United States

— w/o global financial spillovers — w/ global financial spillovers — baseline

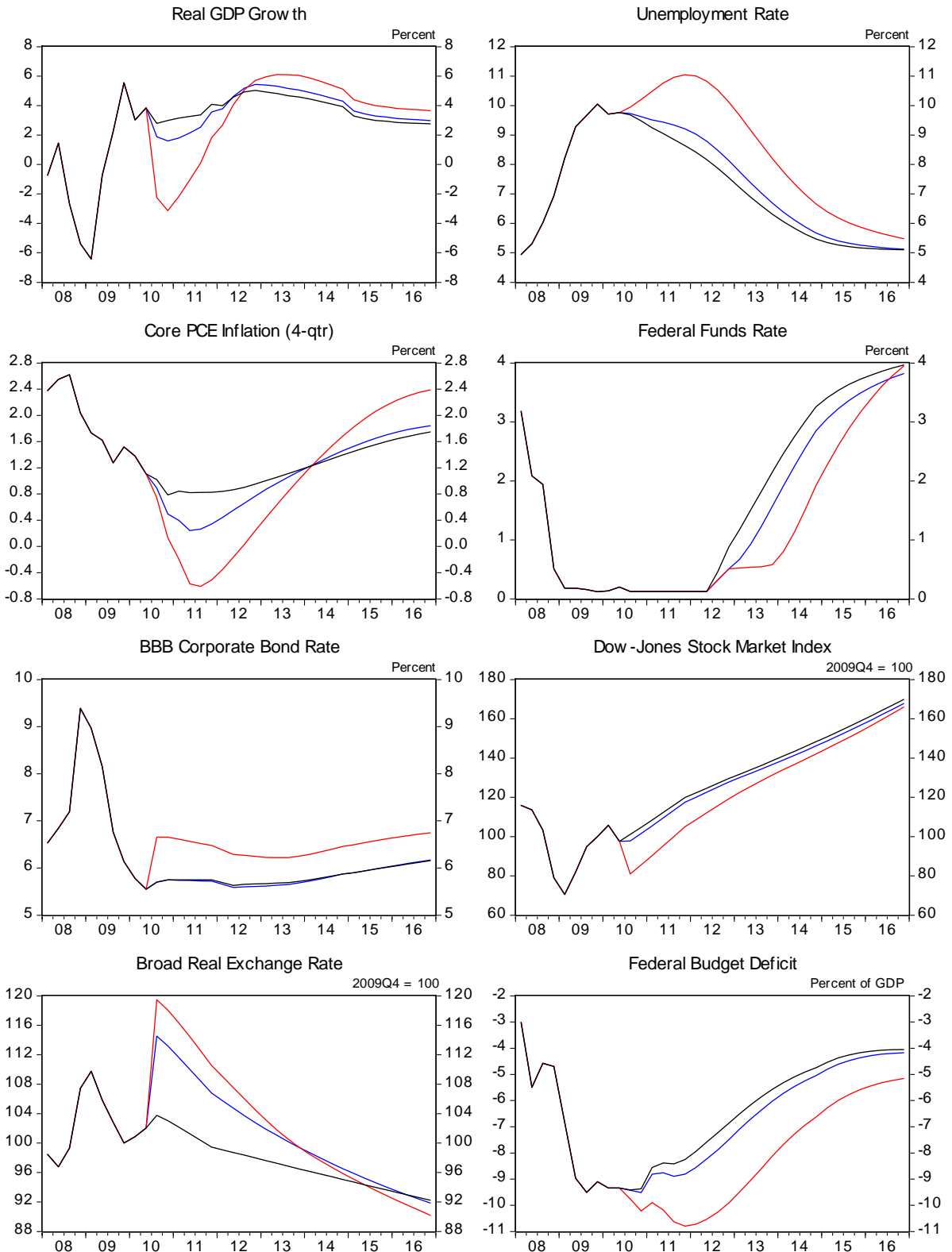


Figure 3
Implications of a Severe European Debt Crisis for the United States
If the United States Lost Its Safe-Haven Status

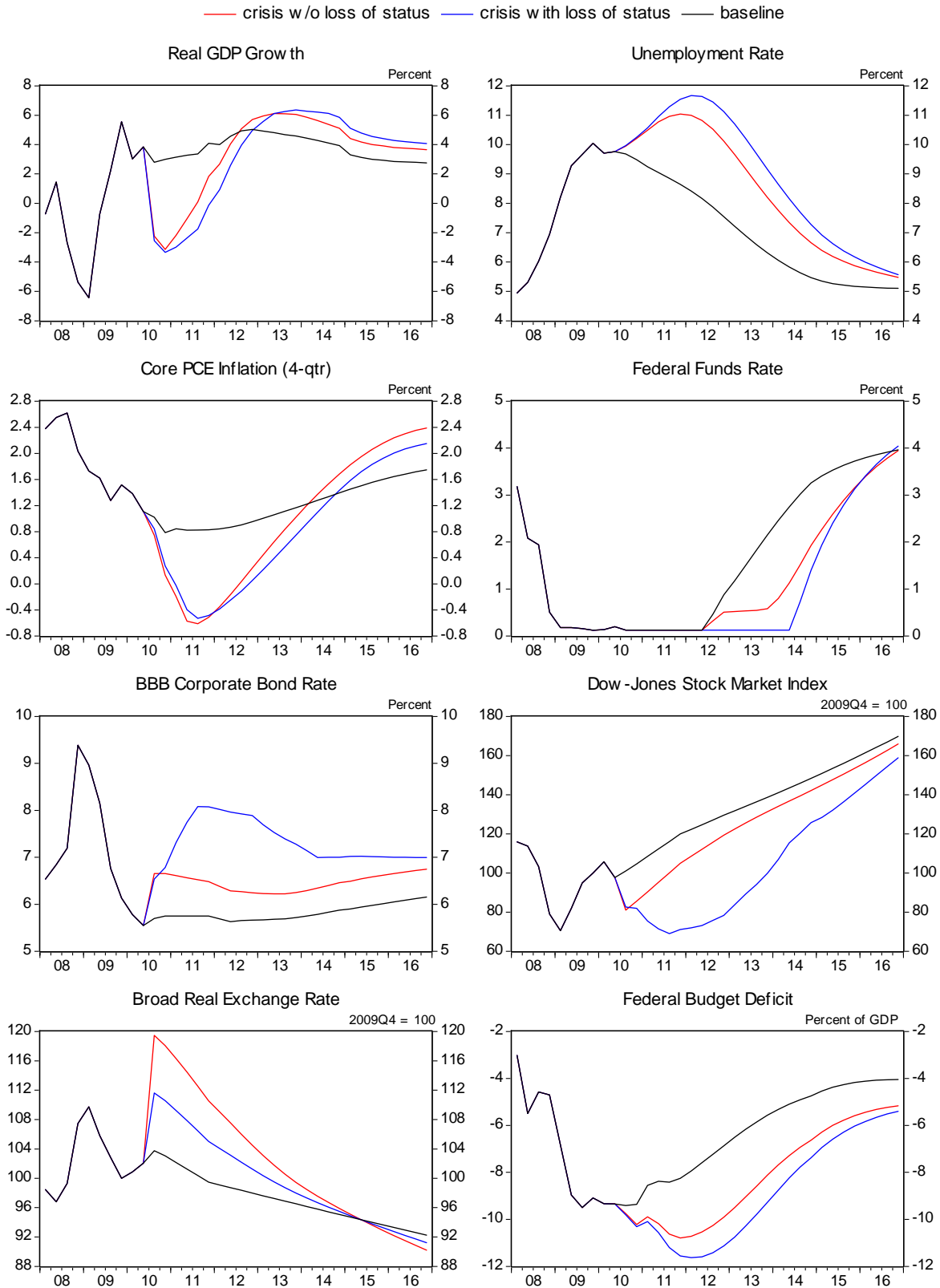


Figure 4
Implications of a Severe European Debt Crisis for the United States
If the United States Lost Its Safe-Haven Status and
Long-Run Inflation Expectations Rose Because of Reduced FOMC Credibility

