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CONTAINING THE THREAT TO THE GLOBAL ECONOMY

James R. Barth, Tong (Cindy) Li, and Apanard (Penny) Prabhavivadhana

Preface by Ross C. DeVol



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Ross C. DeVol
Chief Research Officer, Milken Institute

My colleagues have written an informative piece about the current troubling situation in the euro zone member countries. In my opinion, recent events seem to suggest that policymakers are beginning to understand the necessity of addressing the euro zone's sovereign debt and banking problems head-on. But a thorough review of where the risks lie can be helpful in crafting a solution.

In this paper, Barth, Li, and Prabhavivadhana address the exposure of banks by country and institution, and indicate alternative solutions to contain the threats to the global economy.

It is my view that:

- The Greek sovereign debt problem isn't one of liquidity, but of potential insolvency. It must be addressed accordingly.
- French and German banks have the most direct exposure to Greek and IIPS sovereign debt.
- A "bazooka approach" to address the problem is necessary.
- A euro zone plan must restructure (write down) Greek debt and demand structural economic reforms by Greece. Banks must be recapitalized with around €200 billion, and the size of the European Financial Stability Facility (EFSF) should be increased to €1 trillion.

European policymakers must end the practice of doing too little, too late—but just enough so that financial markets don't crater on Mondays after each weekend's emergency meetings. Political and financial leaders in Europe must take out a bazooka to address the problem decisively so that market participants are convinced that the potential contagion effects are contained. It would be preferable to err on the side of doing *more* than what seems necessary.

What should the elements of the plan be? It must mark-to-market Greek sovereign debt and reflect the diminished value of IIPS country debt as well. The so-called "Troika" (the ECB, the EU, and the IMF) should demand that Greece implement structural economic reforms, in addition to fiscal austerity, that will improve its underlying competitiveness, enabling it to better service its reduced level of debt. Greek access to the next tranche of liquidity funding from the Troika should be contingent upon those structural reforms being passed.

Next, European banks with the greatest exposure to Greek and IIPS sovereign debt (mainly French and German institutions) must be recapitalized sufficiently to end speculation that they may become insolvent. This will require €200 billion from national governments and other euro zone institutions such as the EFSF. Additionally, it is necessary to boost the size of

the EFSF to €1 trillion from €440 billion. Simultaneously, the EFSF should be permitted to purchase euro zone sovereign debt to act as a stabilizer of last resort.

Even with these actions, a mild euro zone recession is likely, but if they are taken, the cascading effects around the world would be contained and a global recession could be avoided. Europe's economy could begin to expand on a sustainable basis by the second half of 2012. Greece should not be allowed to be the trigger for a global recession—and it can be avoided with the proper policy actions.

Greece's "Unpleasant Arithmetic"

Containing the Threat to the Global Economy

James R. Barth, Tong (Cindy) Li, and Apanard (Penny) Prabhavivadhana¹

It may seem odd that Greece, which accounts for only 0.16 percent of the world's population and 0.43 percent of its GDP, has the potential to trigger another global recession. The fact that the United States did so three years ago was no big surprise (though a huge disappointment), given its footprint in the global economy. Yet strange as it may seem, Greece, despite its small size, is edging ever closer to severely disrupting global financial and economic markets unless decisive corrective action is taken.

How did we get to this point? The underlying numbers behind Greece's public finances provide perspective and reveal some "unpleasant arithmetic" (to borrow a phrase from Nobel Prize winner Thomas Sargent).

As figure 1 indicates, Greece had the highest debt-to-GDP ratio among the so-called periphery countries of Europe (Greece, Ireland, Italy, Portugal and Spain—the GIIPS or the PIIGS, as they've been dubbed); it stood at 143 percent in 2010. By way of comparison, the corresponding ratios for France, Germany, and the United States were 77, 58, and 68, respectively. Greece's deficit at the same time was 10.4 percent of GDP, which was higher than all the other countries in figure 1 except Ireland. In comparison, the corresponding ratios for France, Germany and the United States were 7.1, 3.3, and 10.3, respectively.

Due to its alarmingly high ratios, Greece reached an agreement with the other euro zone member countries, with the backing of the IMF, for a bailout of \$145 billion (€110 billion) in May 2010.² Of this amount, \$40 billion (€30 billion) was made available immediately, with the remaining portion to be provided after 2010. In exchange, Greece was to implement fiscal austerity measures with the goal of reducing its deficit-to-GDP ratio sufficiently so that it could once again begin issuing sovereign debt at reasonable interest rates by 2013.

Greece continued to struggle with its fiscal problems, however, so the EU announced a new program in July 2011. It provided \$157 billion (€109 billion) in another bailout for Greece, structured to include lower interest rates and extended maturities. Unfortunately, despite these efforts, things continued to deteriorate.

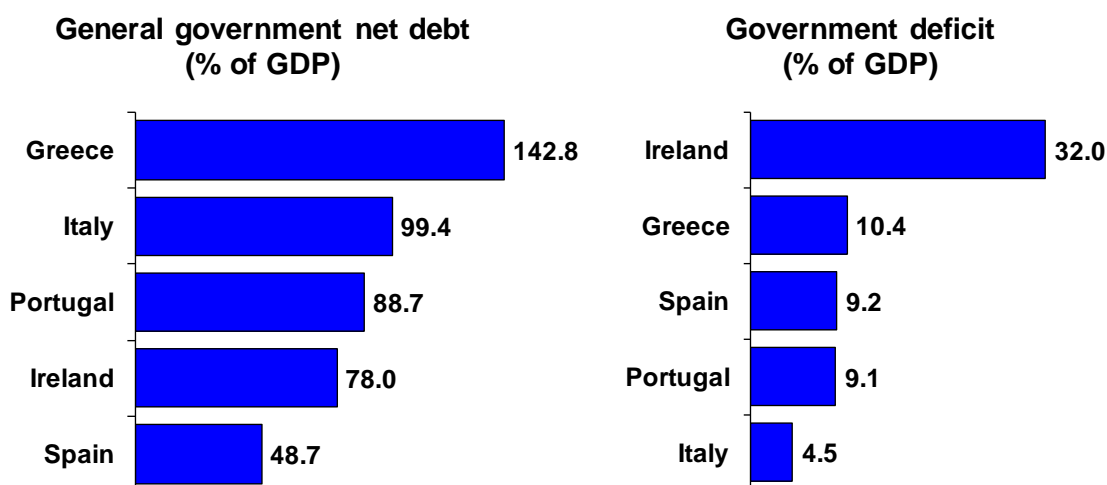
On October 2, 2011, the Greek government publicly stated that its deficit for the year would be 8.5 percent of GDP, exceeding the target of 7.8 percent set under the terms of the original bailout. This disturbing news means that without drastic action, its debt-to-GDP ratio

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² The Maastricht Treaty, which took effect on November 1, 1993, created the European Union (EU) and led to the creation of the euro. It specified that EU member states adopting the euro were not to let their ratio of government deficit to GDP and their ratio of government debt to GDP to exceed 3 percent and 60 percent, respectively.

will rise to even more alarming levels in the current and subsequent years. Indeed, the ratio is reaching levels at which it becomes extremely difficult, if not impossible, for a country to avoid default on its debt.³

Figure 1. Deficits and debt for the GIIPS countries, 2010



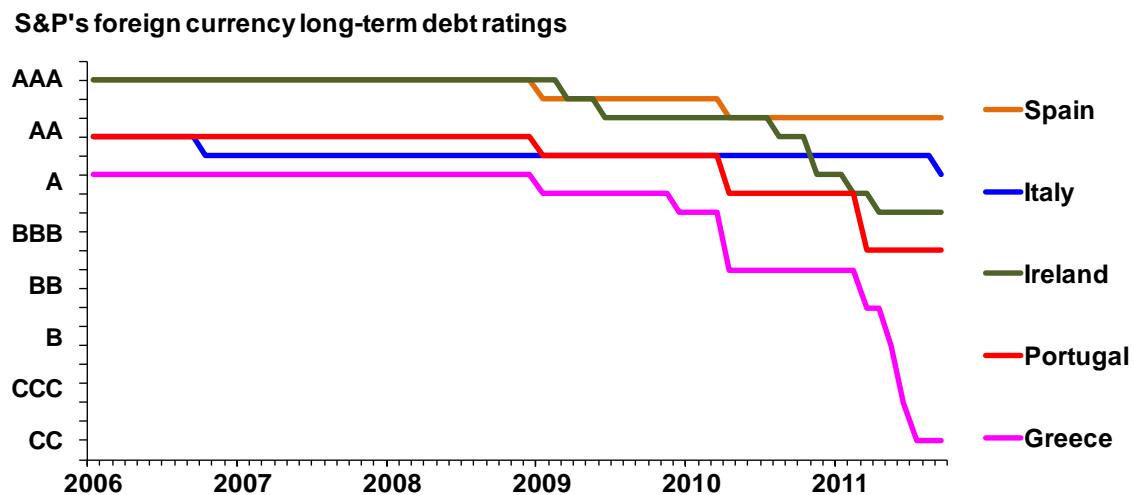
Sources: World Economic Outlook, International Monetary Fund; Milken Institute.

Clearly, the high and rising debt-to-GDP ratio puts an extremely heavy burden on the Greek government, both economically and politically, if it is to be reduced to a more manageable level solely through expenditure cuts and tax increases as well as the sale of public assets to the private sector. Indeed, the fiscal austerity measures may be so severe that they impede economic growth—so that whatever loans Greece receives may simply postpone rather than avoid a default.

This is not mere idle speculation. Consider S&P's credit ratings for the sovereign debt of the GIIPS countries. Starting in 2009, the sovereign debt of Greece has been downgraded several times, most recently to a low rating of CC on July 27, 2011. This is a far lower credit rating than those assigned to the debt of any of the other GIIPS countries, indicating a much higher likelihood of default on Greek debt. (By comparison, France and Germany still retain their AAA ratings, while the credit rating of the United States was downgraded to AA+ from AAA on August 5, 2011.)

³ According to Carmen M. Reinhart and Kenneth S. Rogoff in "This Time Is Different: A Panoramic View of Eight Centuries of Financial Crises," NBER Working Paper No. 13882 (2008), Greece has defaulted on its sovereign debt at least five previous times in the modern era (1826, 1843, 1860, 1894, and 1932). It is also instructive to note that Japan has a net government debt-to-GDP ratio of 130.6 percent and a much higher gross government debt-to-GDP ratio of 233.1 percent. But only 15 percent of its debt is held abroad. By contrast, 91 percent of Greece's debt is held abroad.

Figure 2. S&P's sovereign downgrades for the GIIPS countries

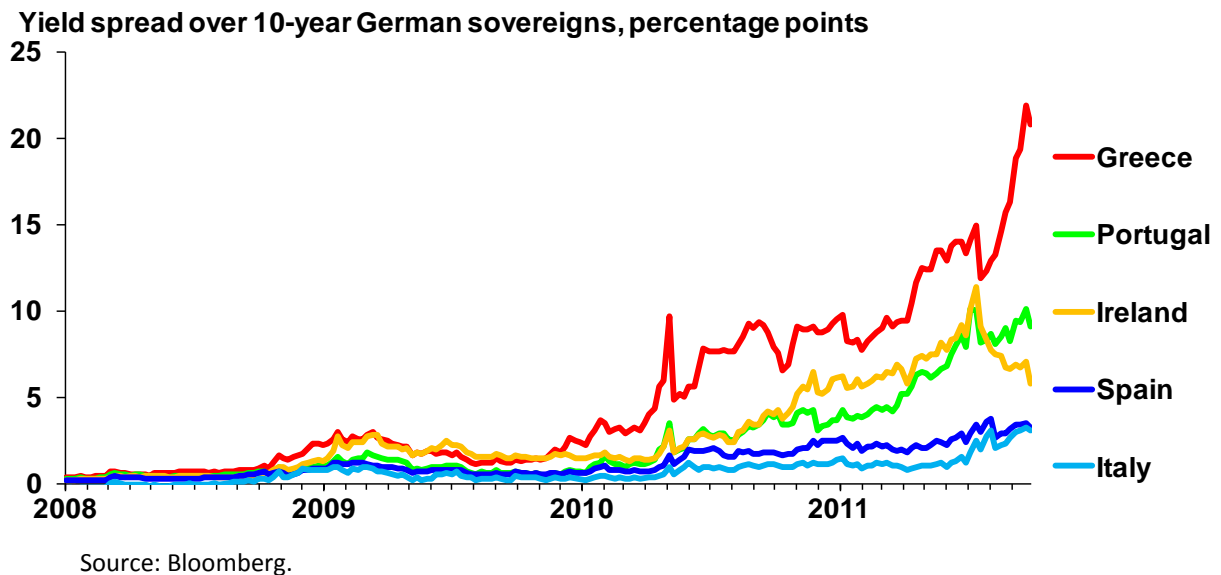


Source: Bloomberg; Milken Institute.

In addition to its low credit rating, the interest rate that Greece has to pay on its sovereign debt indicates an escalating likelihood that Greece will have to substantially write down its debt. As figure 3 shows, the yield spread between Greek and German sovereigns reached a high of 22 percentage points on September 23, 2011. Such a wide spread indicates that investors do not consider Greek sovereigns to be worth anything close to their face value, despite the financial support thus far provided to Greece and the reform efforts it has implemented to date. Indeed, Greek debt has been trading in recent weeks at about 40 cents on the dollar.⁴ Based upon this recovery figure and the difference in interest rates between Greece and Germany, the probability of default by Greece on its sovereign debt stood at 89 percent as of the end of September 2011. There are some investors, of course, who consider this a buying opportunity based on their belief that ample funds will eventually be provided to Greece to enable it to avoid a default.

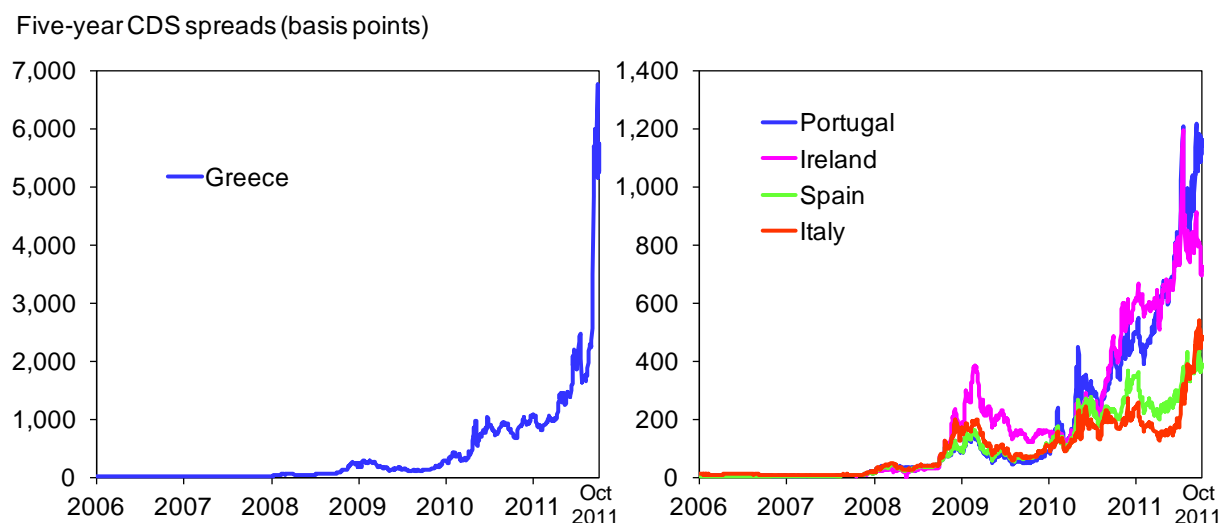
⁴ Wall Street Journal, October 4, 2011, page C4.

Figure 3. Sovereign yield spreads between the GIIPS countries and Germany, weekly



Investors' perception of the likelihood of a Greek default on its debt is also reflected in the credit default swap market. Figure 4 indicates that the cost to an investor of insuring against losses on Greek sovereigns reached a record high of 6,752 basis points on September 26, 2011. The CDS spread had been trending upward during the past year, but its rise rapidly accelerated after July 2011. The spread was an enormous 5,248 basis points as of October 5, 2011. (By comparison, the spread in basis points for Portugal was 1,140; for Ireland 712; for Italy 474; and for Spain 376. The comparable figures for the sovereign debt of France, Germany, and United States were far lower at 185, 108, and 51 basis points, respectively.) The probability of default by Greece on its sovereign debt is 97 percent based upon the different prices of credit default swaps for Greece and Germany.

**Figure 4. Sovereign credit default swaps spreads
for the GIIPS countries reach record highs in October 2011**



All the information presented thus far indicates that Greece currently is in far worse shape than the other GIIPS countries. Two possible responses to the deepening crisis are as follows.⁵

One alternative is to provide even more outside financial support to Greece—but some euro zone member countries have become increasingly reluctant to pursue this course. Worse yet, such support only adds to the debt that eventually has to be repaid by Greece.

To compound problems, Greece is not the only euro zone member country with difficulties. In recognition of this situation, the euro zone member countries agreed to establish a substantial amount of funding/guarantees to address future financial problems for all member countries on May 10, 2010. The amount agreed to was \$965 billion (€750 billion), with \$77 billion (€60 billion) allocated to the European Financial Stability Mechanism; \$566 billion (€440 billion) to the European Financial Stability Facility; and \$322 billion (€250 billion) in the form of credits provided by International Monetary Fund.⁶ Subsequently, in November 2010, the EU and the IMF and three nations (United Kingdom, Denmark, and Sweden) agreed to a bailout of \$88 billion (€67.5 billion) for Ireland.⁷ This was soon followed in May 2011 with a \$116 billion (€78 billion) bailout provided by the EU and IMF to Portugal.

⁵ There are clearly other alternatives beyond those considered here. For example, some suggest that Greece should give up the euro as its currency and revert back to the drachma. So far, however, it appears that this is not a likely outcome. A related issue is the creation of an acceptable fiscal union to accompany the monetary union for the euro zone member countries.

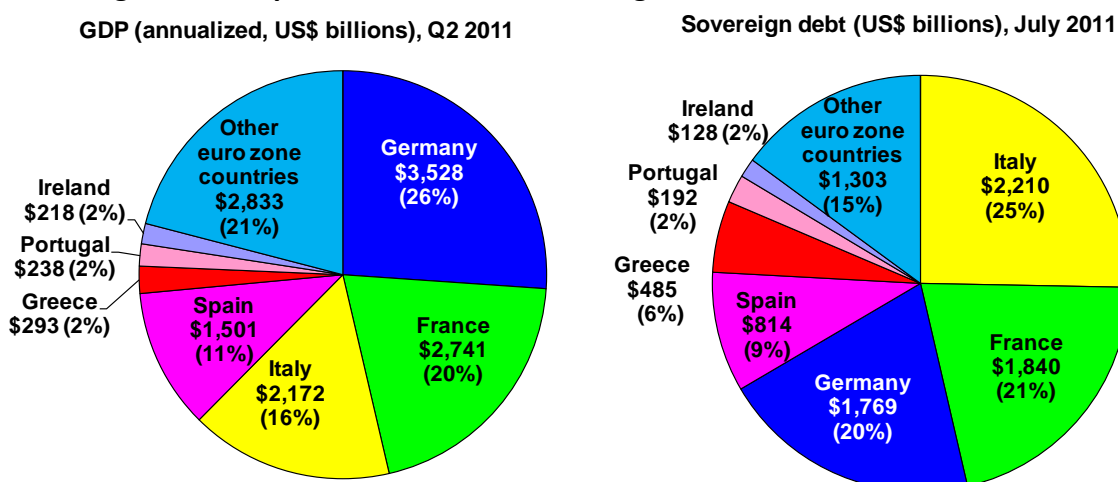
⁶ As of October 8, 2011, all 17 euro zone member countries had not ratified the increase in the lending capacity of the EFSF to €440 billion.

⁷ As part of the package, Ireland's own contribution was €17.5 billion, which would come from the National Pension Reserve Fund and other domestic cash resources. See <http://www.finance.gov.ie/viewdoc.asp?DocID=6600>.

All of the financial support provided to not only Greece but also to Portugal and Ireland has clearly not yet solved the sovereign debt problems of these countries, as the various data mentioned above indicate. Furthermore, this may only be the tip of the iceberg. There are also potential problems in the far bigger countries of Spain and Italy that may require outside financial support. Indeed, as of early October 2011, the European Central Bank, through its Securities Market Program, has purchased not only the sovereign debt of Greece, Portugal, and Ireland, but also the sovereign debt of Spain and Italy in the aggregate amount of \$220 billion (€163 billion).⁸ On October 7, moreover, Fitch downgraded the sovereign debt of Spain from AA plus to AA minus and Italy from AA minus to A plus.

Figure 5 indicates that Spain and Italy together have sovereign debt of \$3 trillion as compared to a total debt of \$805 billion for Greece, Ireland, and Portugal. Although France and Germany are the two biggest European economies in terms of GDP and are in better financial shape than the GIIPS countries, relying on them to help prevent a default on a total debt of \$3.8 trillion is most likely asking them to assume too big a burden, both financially and politically.

Figure 5. Comparison of GDP and sovereign debt of Eurozone countries



Note: Other euro zone countries include Austria, Belgium, Cyprus, Estonia, Finland, Luxembourg, Malta, the Netherlands, Slovenia and Slovakia. GDP and exchange rate data for Greece and Luxembourg are Q1 2011. Sources: ECB; OECD; quarterly GDP data from Bloomberg; exchange rates from Thomson Reuters; Milken Institute.

A second alternative for dealing with the crisis is for Greece to default on its debt (i.e., restructure its debt through a substantial writedown in its face value, perhaps of 50 percent or more). This shifts some of the burden from the Greek government to the investors in its sovereign debt. This would substantially lighten the political burden of the government and

⁸ See http://www.ecb.int/press/pr/date/2011/html/pr111006_4.en.html and http://www.ecb.int/press/pr/date/2011/html/pr111006_3.en.html. It should be noted that the loans provided by European Central Bank are only meant to deal with liquidity, not solvency problems.

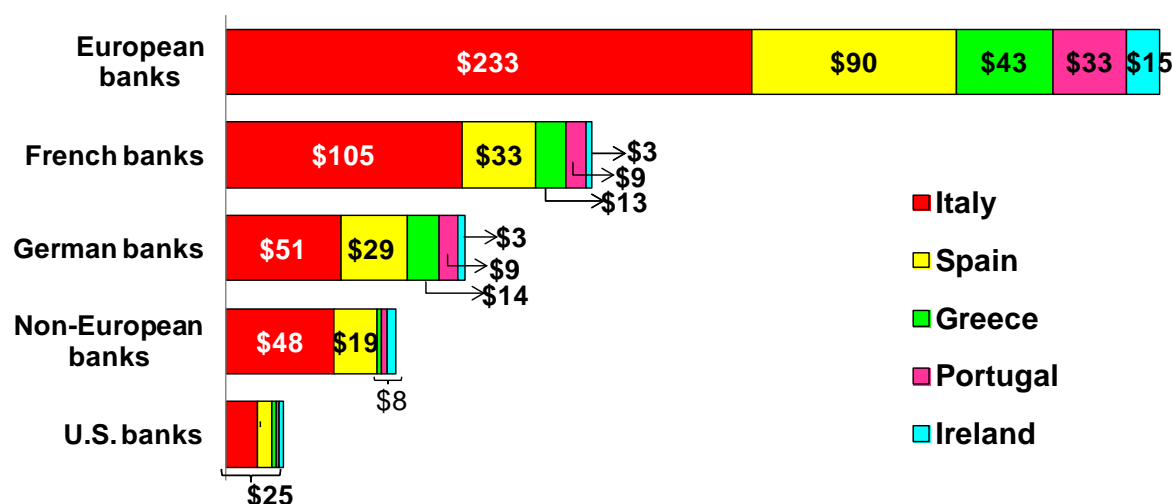
make the fiscal measures needed to achieve the earlier agreed upon deficit targets more manageable.

However, the major concern with such an action is that some of this debt is held by banks. This means that any writedown of the debt (beyond any that have already been taken) would adversely affect the financial condition of these institutions.

Figure 6 shows that the total exposure of non-Greek European banks to Greek debt is \$43 billion, while the total exposure of non-European banks is \$2 billion. It is clear that nearly all the debt exposure lies with European banks, which raises the concern of contagion throughout the financial sector of Europe, as investors might expect writedowns of sovereign debt of not just Greece but also of other euro zone countries.

Almost two-thirds of the exposure of Greek debt, moreover, is at French and German banks. The direct exposure of U.S. banks to Greek sovereign debt is negligible in comparison.⁹ (However, some U.S. banks do have exposure to the sovereign debt of other euro zone countries that could be adversely affected by a Greek default. They also serve as counterparties to credit default swaps issued to investors to help protect them against any losses on euro zone country sovereign debt.)

**Figure 6. Bank exposure to the GIIPS countries sovereign debt
(US \$ billions, March 2011)**



Note: The data are for 24 countries and only include cross-country holdings.

Sources: Bank for International Settlements (*BIS Quarterly Review*, September 2011); Milken Institute.

Many European banks have not yet written down their holdings of Greek sovereigns to the level at which they might ultimately have to in any debt restructuring. As a result of any

⁹ The U.S. banking system's exposure to the GIIPS countries sovereign debt was \$25 billion as of March 2011. In addition to these claims, the U.S. banking system's exposure to GIIPS banking system and GIIPS non-bank private sector was \$61 billion and \$89 billion, respectively (Bank of International Settlements, *BIS Quarterly Review*, September 2011). There is also exposure at U.S. money market funds.

further writedowns, these banks may find it necessary to raise capital, especially in view of the new and higher capital requirements under Basel III. To the extent such banks are unable to raise sufficient capital on their own, their governments might find it necessary to maintain stability by recapitalizing the banks themselves.

This only adds to the fiscal challenges that many euro zone governments are currently confronting and to potential disagreements among the different national governments about how best to proceed. With respect to the latter issue, it is reported that Germany prefers that the banks take efforts to recapitalize themselves and, if they cannot, to have their national governments recapitalize them. In the case of France, however, reports indicate that it is concerned that if it bails out its banks, it will jeopardize its AAA rating, which could raise the interest rate on newly issued sovereign debt. France is therefore reported to favor maximizing the use of the existing emergency rescue funds.

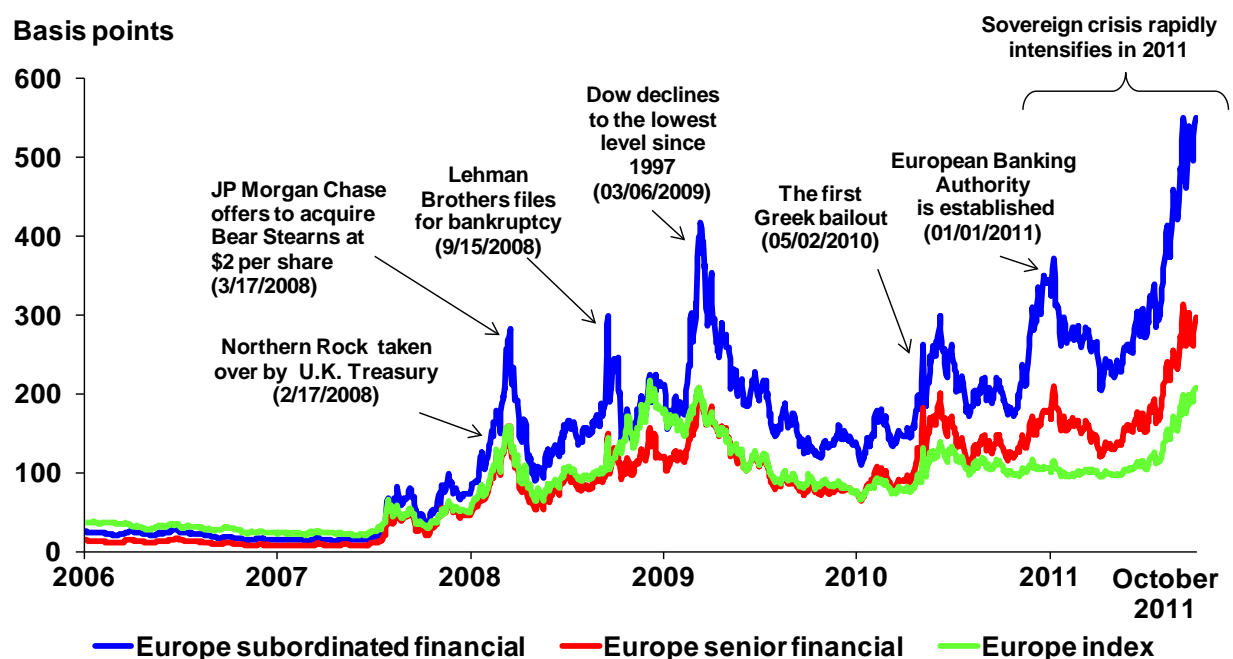
But the story does not stop here. The doubts swirling around Greece, Ireland, and Portugal¹⁰ also create uncertainty about other countries, including Italy and Spain, as well as whether the political resolve and economic capacity exists to confront those issues. If the problems were to spread to the far bigger countries of Spain and Italy, the consequence could be numerous escalating and costly sovereign debt and banking crises. This, in turn, could lead to a severe European, and even global, recession.

The current situation in the euro zone countries is therefore exacerbated by uncertainty, which is always the biggest enemy of well-functioning financial markets. The overriding piece of uncertainty concerns the ultimate magnitude and location of the potential losses within the financial and fiscal sectors of the different euro zone member countries. Additional anxiety stems from whether the various entities capable of providing financial support to help cover such losses will agree in a timely manner on corrective action, eliminating the threat of contagion by putting all the countries in question on sustainable fiscal and economic growth paths.

Figure 7 shows that the credit default swap spreads for European banks recently reached record highs, much higher than even the levels they hit following the collapse of Lehman Brothers in September 2008. This further underscores the widespread anxiety about the magnitude and scope of the sovereign debt and banking problems. This atmosphere, in turn, contributes to a decline in confidence on the part of consumers and businesses and a corresponding desire to spend less and save more in the form of safe assets like gold, the Swiss franc, and U.S. Treasury securities. Such actions curtail increases in employment and impede the economic growth that is ultimately needed to reduce the debt- and deficit-to-GDP ratios to manageable levels.

¹⁰ Ireland appears to have been taking effective action to deal with its problem as evidenced by the recent decline in its credit default swap spread (Figure 4) and a significant narrowing of its sovereign yield spread with Germany (Figure 3).

Figure 7. Credit default swap spreads for European banks reach record highs



Note: The data are the Markit iTraxx European Senior Financial index, the Markit iTraxx Subordinated Financial Index, and the Markit iTraxx Europe index.

Sources: Bloomberg; Milken Institute.

Figure 8 shows the exposure of selected European banks to the sovereign debt of the GIIPS countries as of December 31, 2010, based upon stress tests performed by the European Banking Authority.¹¹ Of the six banks, Dexia is clearly the most exposed, with an exposure to GIIPS sovereign debt at nearly 130 percent of its core capital. Not surprisingly, as of October 10, 2011, a deal had been reached to bail out Dexia for the second time, indicating the adverse impact of the euro zone crisis on this bank. The other five banks have also significant exposure to the sovereign debt of GIIPS countries, with by far the most exposure to Italian debt. The exposure to Greek debt is second in importance for the banks. The fact that these are French and German institutions explains the recent focus by the two national governments on recapitalizing banks.

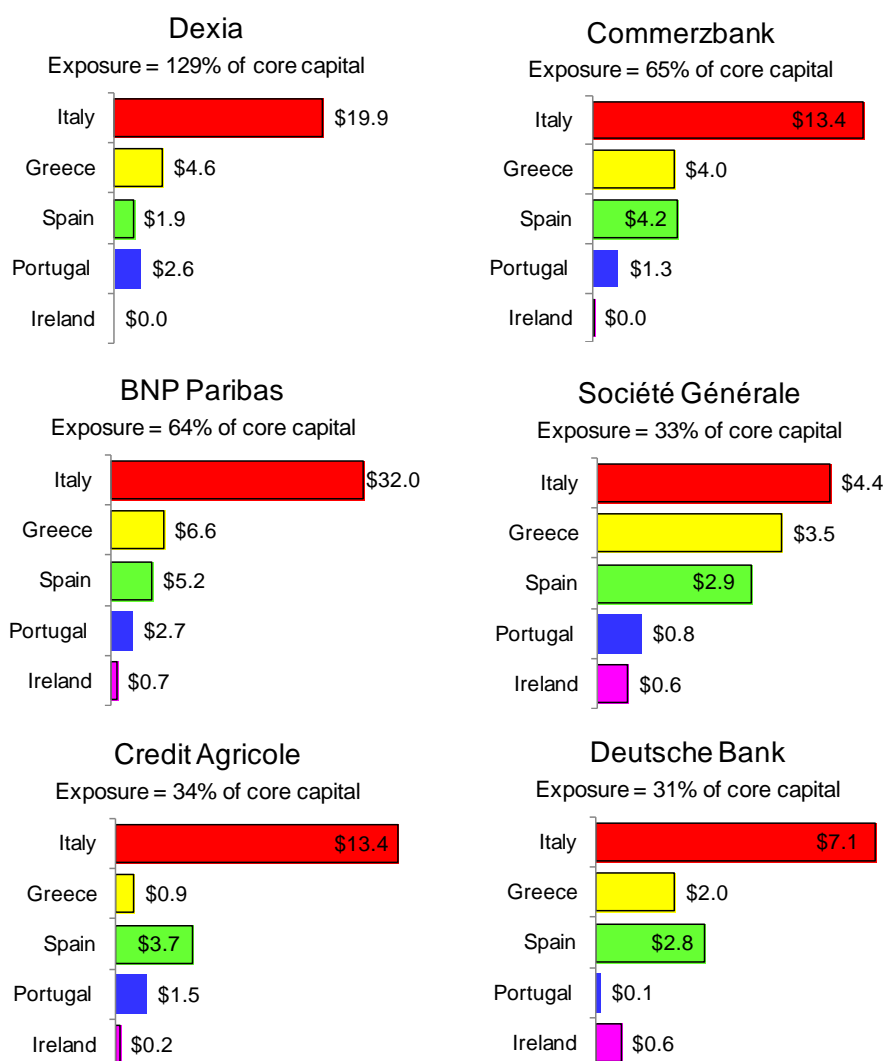
Recognizing the problems of the euro zone banks, and in particular their heavy reliance on short-term private debt that has substantially dried up, the European Central Bank reported on October 5, 2011, that it would provide unlimited loans to banks for about a year at the benchmark interest rate (currently 1.5 percent).¹² It also reported that it would spend €40 billion on buying covered bonds from banks. (The appendix provides detail on the exposure

¹¹ These tests were deemed by many to lack credibility because regulators decided not to take into account the possibility of default on sovereign debt.

¹² See http://www.ecb.int/press/pr/date/2011/html/pr111006_4.en.html and http://www.ecb.int/press/pr/date/2011/html/pr111006_3.en.html.

of some of the biggest global banks to the GIIPS countries sovereign debt as well as related financial information on these banks. It also shows that not only are banks exposed to the debt of other countries, but also the debt of their own country.)

Figure 8. Individual bank exposure to the GIIPS countries sovereign debt
(six banks with an exposure greater than 30% of Tier 1 capital)
 (US \$ billions), as of December 31, 2010



Sources: Bloomberg; European Banking Authority; Milken Institute.

The governments of the euro zone member countries, as well as the European Commission, European Central Bank, and the International Monetary Fund, among other national governments, have been faced with significant financial and political challenges in resolving this precarious situation. The dual challenge is to resolve both the sovereign debt problems of the GIIPS countries and the associated banking problems in the broader European Union. Although different types of fundamental factors created the problems in each country

(some related to high unit labor costs and a lack of competitiveness, and others related to real estate markets and a heavy reliance on external debt), it is difficult for any country to grow its economy without a banking system supplies adequate credit to consumers and businesses. At the same time, it is difficult for banks to supply credit without adequate capital in place. And whether or not banks have adequate capital is highly dependent upon what happens to the value of the sovereign debt held on their balance sheets.

Let's return to the original question: How can Greece matter so much given that it is so small? The answer is that Greek debt is relatively small, but a sufficient amount is held by a few major banks in Europe to cause disruptions to the credit system—and disruptions to the credit system will adversely affect economic growth. This effect is magnified because other banks from around the world are exposed to these European banks, making the problem global. It is therefore imperative that European national authorities take more decisive and corrective actions to deal with their banking and sovereign debt problems to head off a global banking crisis.

Appendix. Selected bank exposure to the GIIPS countries sovereign debt as well as bank financial condition information

Bank	Country	Bank CDS		Stock price		Bank's selected information				Exposure (12/31/2010) (in US\$ billions) ⁽⁴⁾							
		5-year CDS (bps) (10/7/11)	YTD change	Price (US\$) (10/7/2011)	%YTD	TA (US\$ bn) (Q2 2011)	Common equity to TA (%) (Q2 2011)	Tier 1 capital ratio (Q2 2011)	Market cap/ Common equity (%) ⁽³⁾	Greece	Ireland	Italy	Portugal	Spain	GIIPS	Exposure to GIIPS (% core Tier 1 capital)	Exposure to GIIPS (% core Tier 1 capital) (exclude own) country exposure ⁽⁵⁾
Morgan Stanley ⁽¹⁾	United States	435	267	14.24	-47.7	831	7.01	16.7	47.2	nil	nil	1.73	nil	nil	1.73	3.27	3.27
UniCredit SpA	Italy	405	221	1.15	-44.4	1,333	7.04	9.1	23.7	0.85	0.08	62.95	0.11	2.53	66.52	140.42	7.53
Intesa Sanpaolo	Italy	403	207	1.71	-32.9	935	9.14	11.8	32.5	0.82	0.15	76.46	0.09	1.01	78.54	226.26	5.99
Bank of America	United States	400	248	5.90	-55.8	2,261	9.09	11.0	29.1	0.10	0.41	1.27	0.04	0.10	1.92	1.53	1.53
RBS	United Kingdom	363	237	0.37	-39.5	2,323	5.17	13.5	33.7	1.53	0.53	6.18	0.28	0.50	9.02	11.53	11.53
Goldman Sachs ⁽¹⁾	United States	360	146	92.69	-44.9	937	7.39	14.7	70.2	nil	nil	nil	nil	nil	nil	nil	nil
Lloyds TSB	United Kingdom	341	135	0.54	-47.2	1,573	4.59	11.6	51.4	0.00	0.00	0.04	0.00	0.08	0.12	0.20	0.20
Société Générale	France	330	169	27.47	-49	1,680	3.57	11.3	35.5	3.52	0.59	4.43	0.84	2.95	12.32	33.37	33.37
Banco Santander	Spain	308	146	8.48	-20.1	1,788	5.97	10.4	67.1	0.23	0.00	0.35	4.82	55.47	60.87	109.24	9.69
BBVA	Spain	305	36	8.64	-14.7	825	6.34	9.8	81.0	0.17	0.00	5.17	0.86	70.92	77.12	233.06	18.73
Citigroup ⁽¹⁾	United States	292	58	24.63	-47.9	1,957	9.00	13.55	40.8	nil	nil	9.5	nil	nil	9.5	7.53	7.53
BNP Paribas	France	243	69	42.25	-33.7	2,795	3.54	11.9	51.6	6.63	0.66	32.00	2.70	5.18	47.16	64.21	64.21
Credit Agricole	France	238	128	7.18	-43.6	2,313	2.78	11.0	27.8	0.87	0.18	13.43	1.47	3.68	19.63	31.97	31.97
Barclays	United Kingdom	220	68	2.56	-37.1	2,399	3.45	13.5	37.7	0.12	0.54	3.87	1.56	7.29	13.38	21.81	21.81
Commerzbank	Germany	216	100	2.37	-60.3	992	3.35	11.6	36.4	4.04	0.03	13.44	1.29	4.20	23.01	64.88	64.88
UBS ⁽²⁾	Switzerland	201	101	11.48	-30.8	1,469	3.82	18.1	78.4	0.04	nil	3.00	0.03	nil	3.07	8.15	8.15
ING	Netherlands	196	51	7.55	-22.6	1,800	3.49	n.a.	46.0	0.99	0.12	7.57	0.92	2.33	11.93	29.09	29.09
Standard Chartered ⁽²⁾	United Kingdom	195	102	20.65	-23.1	568	7.21	13.9	120.0	nil	nil	nil	nil	nil	nil	nil	nil
Deutsche Bank	Germany	182	76	35.01	-33.1	2,684	2.71	14.0	44.8	2.00	0.63	7.08	0.11	2.76	12.59	31.26	31.26
HSBC Bank PLC	United Kingdom	164	75	7.92	-21.8	2,691	5.96	12.2	88.3	1.22	0.18	5.12	0.42	0.84	7.78	6.75	6.75
JPMorgan ⁽¹⁾	United States	160	76	30.70	-27.6	2,247	7.79	12.4	68.4	nil	0.19	5.29	nil	0.94	6.42	4.50	4.50
Credit Suisse	Switzerland	160	59	25.81	-34.5	1,160	3.20	18.2	83.7	0.13	nil	3.30	0.13	nil	3.58	8.92	8.92
Wells Fargo	United States	159	54	24.54	-20.6	1,260	9.90	11.7	103.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Dexia SA	Belgium	n.a.	n.a.	1.13	-65.7	751	1.34	11.4	21.9	4.59	0.00	19.92	2.56	1.92	28.98	128.46	128.46

Sources: Bloomberg. The gross exposure data for European banks are from European Banking Authority unless noted; exposure data for U.S. banks are from their 10-K annual reports. Exposure data for Credit Suisse, UBS and Standard Chartered are from their annual reports, 2010.

- (1) Goldman Sachs, Citigroup and JPMorgan (Morgan Stanley) do not report cross-border exposures to countries with cross-border outstanding less than 0.75% (1%) of the bank's consolidated assets.
- (2) Standard Chartered annual report, 2010, stated that the bank's exposure to GIIPS sovereign debt is less than 0.5% of the total assets, which is negligible. UBS annual report has only the largest five exposures to sovereign of industrialized European countries.
- (3) Market capitalization is as of 10/7/2011.
- (4) Gross exposures (long) net of cash short position of sovereign debt to other counterparties only where there is maturity matching.
- (5) Excludes exposure to its own country.



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