Silvia Ardagna and Francesco Caselli

The political economy of the Greek debt crisis: a tale of two bailouts

Article (Accepted version) (Refereed)

Original citation:
Ardagna, Silvia and Caselli, Francesco (2014) *The political economy of the Greek debt crisis: a tale of two bailouts.* American Economic Journal: Macroeconomics, 6 (4). pp. 291-323. ISSN 1945-7707

DOI: 10.1257/mac.6.4.291

American Economic Journal: Macroeconomics 2014, 6(4): 291–323
http://dx.doi.org/10.1257/mac.6.4.291

The Political Economy of the Greek Debt Crisis: A Tale of Two Bailouts†

By Silvia Ardagna and Francesco Caselli*

We review the events that led to the May 2010 and July 2011 bailout agreements. We interpret the bailouts as outcomes of political-economy equilibria. We argue that these equilibria were likely not on the Pareto frontier, and sketch political-economy arguments for why collective policymaking in the Euro area may lead to suboptimal outcomes. (*JEL* E58, E62, F34, G01, H61, H63)

Most modern sovereign debt crises have been managed in Washington, DC, through the combined efforts of the International Monetary Fund (IMF) and the US government. A distinctive feature of the crisis that has engulfed European sovereign debt markets since the fall of 2009 has been that the IMF has played only a supporting (albeit important) role, while the management of the crisis has been driven by European institutions: the council of finance ministers (ECOFIN), the European Council (EC, made up by all the heads of government of the European Union), and the European Central Bank (ECB).

To the extent that the IMF is largely a technocratic institution (though of course not entirely immune from political influence), while ECOFIN and the EC are made up of politicians, one may expect the management of the crisis by the EC to be more affected by electoral concerns. Furthermore, since there are 27 members to the EC, representing countries with potentially different interests, one may expect that bargaining and compromise will play a greater role than in cases where the two players are simply the IMF and the country whose debt is under pressure. Finally, the presence of an additional powerful player, the ECB, whose actions can greatly affect the outcome of the crisis, may be expected to impact both the incentives and the constraints of the EC, and introduce further differences in its policy response.

In this paper, we revisit two salient passages of the crisis, keeping an eye out for indications that the considerations above have played a role in shaping the policy response. We do this with two modest goals in mind. First, we assess the extent to which some of the observed decisions can be rationalized as political-economy

*Ardagna: Goldman Sachs, Peterborough Court, 133 Fleet Street, London EC4A 2BB (e-mail: silvia.ardagna@gs.com); Caselli: London School of Economics, Houghton Street, W2A 2AE, UK and LSE, CFM, CEP, CEPR, and NBER (e-mail: f.caselli@lse.ac.uk). We benefited from insightful conversations with Wendy Carlin, Michael McMahon, Herakles Polemarchakis, Morten Ravn, Ronny Razin, and Silvana Tenreyro, and constructive comments from four referees. Excellent research assistance from Kilian Huber, Dana Kassem, and especially Michael Conroy is also gratefully acknowledged. Views and conclusions expressed in this paper are those of the authors and do not necessarily represent those of Goldman Sachs. The authors alone are responsible for any remaining errors
†Go to http://dx.doi.org/10.1257/mac.6.4.291 to visit the article page for additional materials and author disclosure statement(s) or to comment in the online discussion forum.

equilibrium outcomes of the complex game briefly sketched out above. Second, we discuss the extent to which such political-economy equilibria appear to be efficient and, if they are not, whether the particularities listed in the previous paragraph help us understand why the policy response has been inside the Pareto frontier.

Because the ongoing crisis has engulfed many countries and the policy response has been complex and multidimensional, we have to limit our overview both in time and space. We have therefore decided to focus narrowly on policies towards Greece, where the crisis started, and to the period between September 2009 to July 2011. In practice, this takes us from the inception of the crisis, through the period leading up to the first Greek bailout (May 2010), and all the way to the second bailout at the end of our period of analysis. Hence, the paper largely turns into "a tale of two bailouts."[1]

The paper is a first attempt to organize ideas about events that are exceptionally recent and "raw." Our comments are therefore speculative at best. With that caveat, we reach the following tentative conclusions. Regarding the May 2010 bailout, we argue that this was a political-economy equilibrium in the sense that, for each of its signatories, it was *individually rational* to agree to it. In particular, the deal on offer was preferable to unilateral and disorderly Greek default, which would have been the outcome had any individual player refused to sign up. However, this does not necessarily mean that the agreement of May 2010 was the best possible deal available to European leaders, or that it was *collectively rational*. We speculate that a program more generous towards Greece, particularly one that gave Greece more time before having to return to borrowing on private markets, might have made everyone better off.

Concerning the July 2011 bailout, we reach similar conclusions, except that the Pareto inferiority of the deal seems even more apparent. In particular, in addition to unrealistic goals for deficit and debt reduction and access to private lending, that agreement required that Greece seek a symbolic negotiated reduction in the value of its outstanding debt to private creditors (known as "private sector participation," or PSI). We argue that this haircut component was not helpful in solving Greece's problems, while at the same time complicated the prospects of other peripheral Euro zone countries engulfed in contagion. It would thus have been Pareto superior to scrap it altogether.

Having argued for the potential Pareto inferiority of both bailouts, we then use the three above-named features of domestic electoral concerns, bargaining among several parties, and presence of the ECB as an additional player to sketch arguments for why suboptimal equilibria can arise in the novel circumstances of the European debt crisis. We briefly consider the possibility that the main signatories had asymmetric beliefs about the prospects of successful Greek stabilization under the terms of the bailouts. We also discuss at greater length the role of voters' beliefs and voter intransigence in some of the core countries. We find neither of these explanations entirely satisfactory. Hence, we propose two additional political frictions that appear to be particularly relevant in the context of EC decision-making. The first one centres on a communication friction between political leader and voters, which distorts the bargaining stance of the leader vis-à-vis its European counterparts. The second is a bargaining friction that is linked to the time-limited nature of bargaining sessions in EC summits.

[1] For a much more encompassing view of the European sovereign debt crisis, see, e.g., Lane (2012). For an analysis of policy towards Greece subsequent to the July 2011 bailout, see, e.g., Zettelmeyer, Trebesch, and Gulati (2013).

The paper is organized as follows. Section I looks at the period leading up to the first bailout and assesses the first bailout as a political-economy equilibrium. Section II does the same for the period up to and including the second bailout. Section III sketches arguments for why bailout agreements reached within the EC may be inside the Pareto frontier. Section IV summarizes and concludes.

I. The First Bailout

A. *The Road to the May 2010 Bailout*

The proximate trigger for the loss of market confidence in Greece's debt was the October 2009 announcement, by a newly elected government, that the overall budget deficit was much larger than stated by the outgoing one. Instead of 6 to 8 percent of GDP, the deficit was now deemed to be between 12 and 13 percent. With the debt/GDP ratio at 115 percent, and mediocre growth prospects, the announcement led markets to question the long-run solvency of Greece. Such concerns came to a head in December with the first of what will prove to be a long series of credit-rating downgrades. In a mechanism often seen during the crisis (and previously during the crisis in the financial sector in 2007–2009) market views on Greece changed astonishingly rapidly, in seemingly self-reinforcing fashion. By the spring Greece, which only six months before could borrow at rates essentially identical to those paid by Germany, was effectively shut out of the financial market.

The Greek government's response to this predicament was twofold. On the domestic front, it announced and implemented a number of austerity measures, aiming to reduce the budget deficit (see the online Appendix for a partial list). These measures were aggressive, but still insufficient to fill the vast hole that had opened in the budget, and that markets had become unwilling to fill. On the external front, therefore, the government begun exploring options for a bail out that would allow it to avoid default.

The agreement that was struck by the European Council and the IMF in May 2010 amounted to a fairly straightforward "division of labor" where Greece committed to a severe austerity program in exchange for a significant amount of official financial assistance.[2] Specifically, Greece committed to bringing the deficit down to 3 percent of GDP by 2014, with detailed quarterly targets, the compliance with which was to be monitored by officials from the IMF, the European Commission, and the ECB. All other Euro area states were to make bilateral loans to Greece, roughly in proportion to the size of their economies, for a total of approximately £80 billion over three years. The IMF was to lend an additional £30 billion over the same period. The role of the bailout funds was to fill the funding gap left by the austerity program, for the period deemed necessary before Greece could return to borrow on financial markets at acceptable terms.

Some key elements of the May 2010 plan are shown in Table 1. The plan called for Greece's large primary deficit to disappear by 2012, and turn into a significant surplus by the end of the program. Overall deficit reductions were significantly

[2]The agreement was reached by ECOFIN on May 2 and endorsed by the EC on May 7.

Table 1—Greek Package Signed in May 2010

	Primary deficit/GDP	Total deficit/GDP	Gov. debt/GDP	Real GDP growth (%)	Spread over bunds	T-bill issuance (Eur B)	Bonds issuance (Eur B)
2009	−8.6	−13.6	115.1	−2.0		6.1	55.6
2010	−2.4	−8.1	133.2	−4.0	250	8.0	25.4
2011	−0.9	−7.6	145.2	−2.6	200	8.0	4.4
2012	1	−6.5	148.7	1.1	150	8.0	23.4
2013	3.1	−4.9	149.2	2.1	100	8.0	34.9
2014	5.9	−2.6	146.1	2.1	100	8.0	64.5
2015	6	−2	140.4	2.7	100	8.0	66.8

Source: IMF May 2010, Country Report No. 10/110

front-loaded, presumably in order to establish credibility but also, of course, to reduce the needed external assistance. This plan was expected to lead the debt/GDP ratio to stabilize by 2013. Clearly, any such expectation was contingent on assumptions about the future path of GDP, which are also shown in the table. Greece was expected to go through a severe recession lasting until 2012, with substandard growth in that year as well. Perhaps more importantly, the adequacy of the bailout to fill the funding gap depended not only on Greece's meeting its deficit targets, but also on it recovering access to credit from private agents in a relatively short time. The last three columns of Table 1 show the assumed path of interest-rate spreads, as well as planned issuance of short-term and medium/long-term debt. Although the latest tranche of aid was scheduled to be paid in April 2013, the program assumed that Greece would have been able to issue €4 billion in medium- and long-term bonds in 2011, €23.4 billion in 2012, and €34.9 billion in 2013.

The bailout was received with considerable skepticism by economic and financial commentators, as documented in our review of the financial press in the online Appendix. Market reaction was also initially negative, with spreads on Greek bonds surging between May 2 and May 9, as also documented in the online Appendix. These negative responses appear justified by our own rough stab at assessing the feasibility of the program. In the Appendix we compare the May 2010 stabilization program to the largest episodes of fiscal adjustment in the OECD since the 1980s. Briefly, if one looks only at the percentage-point reduction in the primary deficit called for by the agreement, the effort requested of Greece was not unprecedented. However, the macroeconomic backdrop was exceptionally adverse, with much lower predicted GDP growth and much worse initial cyclical position than in any major prior adjustment, and without any realistic prospects of the kind of significant real depreciation that have arguably assisted in other cases.[3]

If the prospects for success of the May stabilization program were so poor, why did European leaders agree to it? And were there possible alternatives that would have made all participants better off? The next two subsections tackle these questions in turn.

[3] See Perotti (2011) on the importance of real exchange rate depreciation for the success of previous fiscal adjustments.

B. *Understanding the Bailout*

In this subsection we take the provisions of the May agreement as given, and we ask whether it was *individually rational* for the main parties to agree to it—conditional on a plausible description of what refusing to sign up would entail.

Before engaging in this analysis we need to briefly discuss the objective functions of the participants in the agreement (we return to this issue in subsequent sections). As all the key players in the agreement were elected heads of state/government, we assume that objective functions are increasing in two arguments: the probability of reelection and a measure of social welfare.[4] Hence, to discuss the costs and benefits from a deal for the key players we need to identify both the economic and the electoral implications of different choices.

Individual Rationality for the Greek Leadership.—Since Greece was shut out of the financial markets, and running a deficit in excess of 10 percent of GDP, it would certainly have defaulted on its debt had it refused the bailout on offer. The consequences of a possible default were deemed (correctly, in our view) to be catastrophic for Greece. It is highly unlikely that a default would have restored market access, meaning that Greece would still have had to incur a gigantic and instantaneous fiscal adjustment of a magnitude at least equal to the primary deficit—in the order of 8 percent of GDP in mid-2010. Furthermore a Greek sovereign default would have been very costly for the Greek banking and financial sectors. In 2010:I, Greek banks' exposure to the general government amounted to 11 percent of their financial assets, and the equivalent figure for insurance companies and pensions funds was 29 percent. Needless to say, the Greek government would have been incapable of recapitalizing these institutions in case of default. Hence, both because of the brutal fiscal retrenchment that a default would have required, and because of the collapse of the banking and finance sector, Greece was likely to experience a deep depression following a default.[5]

Furthermore, such economic dislocation would likely have spelled political death for the prime minister (and possibly a long exclusion from power for his party), as debt default typically spells political instability. For example, Borensztein and Panizza (2008) show that in half of the default episodes in their sample there was a change in the chief of the executive either in the year of the default episode or in the following year. In contrast, in most recent successful fiscal adjustments, the government responsible for the adjustment survived the first electoral tests during or after the adjustment (see the online Appendix).

[4] Note that social welfare here is intended very broadly, and, in particular, may not refer exclusively to the welfare of the citizens of one's own country. For example, hypothetically there may be heads of government that feel such a very strong European identity that they may be willing to trade-off one's own countrymen's welfare for the greater good of Europe.

[5] This discussion assumes that Greece's relevant outside option was just default. In fact it was often assumed at the time that in case of default Greece would also leave the Euro zone. While it is of course logically possible for Greece to default while staying in the Euro zone, it is also possible that, conditional on defaulting, it would make sense for Greece to abandon the Euro, *and impose capital controls* (without capital controls the benefits of leaving the Euro for a country in Greece's situation would likely be very limited). It is also possible that such an exit would be forced upon Greece, as a result of the ECB's refusal to supply liquidity to the Greek banking system. Even so, it seems difficult to imagine that Greece could have avoided a deep depression had it defaulted on its debt.

In sum, for the Greek leadership walking away from the deal was clearly a very costly option. Let us now compare it to agreeing to the bailout terms.

It is clear that, had it led to successful stabilization, the bailout deal's value to the Greek party would have been much larger than the alternative of immediate default. To be sure the deal imposed significant austerity on Greece, but as we have seen savage austerity would have been in the cards in the case of default as well. Furthermore, a bailout would have prevented the collapse of the Greek financial sector.

But as we have seen the Greek leadership might have anticipated a significant chance that the program would fail. By definition, failure of the May 2010 program would have meant (and, retrospectively, did mean), for Greek leaders to soon face again an imminent prospect of disorderly default. In particular, given the front-loaded nature of the austerity program, there was a risk of unraveling within 12–18 months. Could even this outcome be preferable to biting the bullet and defaulting right away?

The answer is yes, as there was a clear option value of waiting for Greece as of May 2010.[6] In particular, Greece might have hoped for a softening in attitudes from the other players that could conceivably lead, in the future, to more lenient bailout terms, particularly as regards the pace of austerity, interest rate charged, and time for repayment. Furthermore, obtaining one or two further years of fiscal adjustment to bring down the primary deficit would have made the catastrophe of default less severe, if/when it would happen.

Individual Rationality for the Lenders.—Most of the other participants to the May 2010 agreement—and certainly the core, financially solid ones—could have scuppered the deal by refusing to subscribe to it. For reasons already discussed this would have triggered a messy, unilateral default. Hence, once again for these parties the value of walking away is the realized value of their objective function in the case of Greek default.

The consequences of Greek default for other European countries were complex. There was some exposure to Greece, especially within the German and French banking sectors. Nevertheless, given the small absolute size of the Greek government bond market, few of such exposures were large enough to threaten the solvency of individual financial institutions, and even in these cases the respective governments could have underwritten the risks relatively easily. For example in June 2010, Germany's (France's) foreign claims vis-à-vis Greece were equal to 0.3 percent (0.55 percent) of total assets of the monetary and financial institutions, and the exposure to Greek government debt was 0.22 percent (0.17 percent).[7]

However there was a high perceived probability that a Greek default would trigger "runs" on other Euro area sovereigns. In particular, it was thought at the time that a Greek default may shut Portugal, Ireland and, possibly, Spain out of the financial

[6] For a broad discussion of option-value considerations in delaying radical decisions in politics see, e.g., Drazen (2000), especially chapter 10. An option-value interpretation is consistent with much of the informal language used by commentators to describe the agreement, e.g., "buying time" and "kicking the can down the road," which were frequent clichés used around May 2010 (and more generally throughout the Euro area sovereign debt crisis).

[7] Here and elsewhere in the paper data on bank exposures are from the Bank for International Settlements (BIS). We don't have data at the level of individual banks, so we can't rule out that these holdings would be very concentrated in a few banks—particularly politically sensitive public-sector ones. Still even in that case the losses in case of default should have been quite manageable.

markets, leading to defaults in these countries as well. A Greek default was often described as the sovereign equivalent of the Lehman Brothers' bankruptcy in finance.

Such contagion would be very costly, for the countries engulfed in it, obviously, but also for other Euro area members. Exposure of core-country financial institutions to assets from potential victims of contagion was much more significant than to Greece only, and the corresponding costs of recapitalizing domestic financial institutions correspondingly much larger.[8] Such potentially large bailouts of domestic banks would not only be costly for the economy, but also for the electoral prospects of the heads of government. In 2010 there was still much lingering resentment for the dislocations caused by the 2007–2009 financial crisis, a resentment exacerbated by government bailouts of some banks. Further direct bank bailouts would be deeply unpopular, and it may plausibly have appeared to be politically less costly to disguise such bailouts as bailouts to a fellow Euro area government.[9]

Aside from the potential costs of contagion and consequent bank bailouts, a Greek default may have been perceived by some heads of government as a threat to the integrity and long-term viability of the common currency. As already mentioned (footnote 5) it was often assumed that Greek default would be accompanied by Greek exit from the Euro. Some heads of government might have felt that such an exit would be seen as a precedent, to be used by other countries in the future to engineer more accommodating monetary conditions. To the extent that some of these same heads of government are committed to the European unification agenda, they may also have perceived such potential threats to the Euro as very costly.[10]

A final consideration that would probably have weighed strongly against allowing Greece to default was fierce pressure from the ECB to avoid such an outcome. The ECB would have been particularly alive to the possibility of Euro zone shrinkage or breakup, given that its very influence and existence depends on the size and existence of the Euro zone. Furthermore it was in the ECB's political interest to make sure that the crisis continued to be perceived as merely a sovereign debt crisis, while keeping the banking implications below the surface of the public debate. As we have seen a default would have exposed the banking implications. As preeminent monetary authority in the Euro area, such exposure would have been embarrassing and would have had the potential of weakening the independence of the Bank. Finally, the bank itself was exposed towards Greece, as it accepted Greek sovereign bonds

[8] Germany's contribution to the first Greek bailout was \$29.3 billion. Germany's banks at the time owned only \$23 billion of Greek government bonds. But their combined holdings of Greek, Portuguese, Irish, and Spanish government debt were valued at \$60 billion and their holdings of debt issued by these countries' banks were worth \$151 billion.

[9] In addition to the concern that a Greek default would engender fears of similar defaults by other Euro zone sovereigns, there was also a worry that financial markets would seize up due to the triggering of Greek CDS contracts. The gross and net exposures to Greek CDS and derivative contracts were about €75 billion and €8 billion, respectively. Just as in the Lehman case, there was no information on the institutions exposed to these Greek contracts, so counterparty risks would have spiked after a triggering of the CDS contract, potentially causing grave harm to the financial system.

[10] We do not want to overemphasize this point, as we suspect a majority of European heads of government (and certainly their electorates) would actually be quite happy to get rid of the Euro at this stage, if they only knew how. However, it must be said that several such governments explained the decision to bail out Greece as motivated by their desire to "save the Euro." To be sure, the main reason for couching the decision in these terms was that "save the Euro" sounded better, at the time, than "save the banks." Still, we can't rule out that some heads of government might have meant it.

as collateral for its liquidity provision operations. Given the enormous influence of ECB policy on Euro area macroeconomic conditions, it is very likely that the ECB's lobbying will be highly influential with Euro area heads of governments, so its opposition to a default is likely to have weighed in their calculations.

In sum, immediate Greek default must clearly have appeared as very costly in expectation to core-country counterparts. What about the bailout?

A much-emphasized cost of bailouts is moral hazard. In the present case, a bailout may encourage Greece to overborrow in the future. More importantly, a bailout of Greece may lull other Euro area governments into believing they will also be bailed out, thus inducing them to overborrow, too.

We should note that this moral hazard argument is less straightforward than it seems. In particular, to avoid moral hazard, core countries' governments would have had not only to let Greece default, but also punish their own banking sectors following the capital losses on Greek (and Portuguese, Irish, etc.) debt. Without this second ingredient banks in the Euro area would simply have learned that a sovereign default in the Euro area can happen, but is of little consequence for their own practices, as any losses will be repaid by taxpayers in their own country. Thus reassured, these banks would have continued to lend to other Euro area governments at relatively favorable terms, which would have done little to remove the overborrowing problem. To prevent this outcome would have required some combination of nationalization of the banks, replacement of the incumbent management, and wiping out of the existing equity holders. Appetite for such actions has been somewhat muted in continental Europe, despite a few high-profile cases.

Even assuming that allowing Greece to default is an effective means to remove moral hazard, it does not follow that any bailout deal generates moral hazard. In particular, any bailout deal is a "burden sharing" agreement, whereby the funding shortfall is filled with a combination of austerity and financial assistance. It seems highly plausible that there is a range of austerity/assistance combinations that make the deal "painful enough" for the recipient country as not to wish to go through the same experience again. And, by observing the painful sacrifices undertaken by the recipient of the bailout, other countries as well should be able to infer that overborrowing is not rewarded.

A more compelling argument against bailing out Greece is the risk of losses on the taxpayers' money invested in the bailout, in case of program failure. One difference between default in 2010 and at a later date is that default in 2010 is default on private lenders, while default at later dates might end up having a component of default on core-country taxpayers. It is true that, as we have argued, even a 2010 default on private creditors would likely have implications for taxpayers, via private-creditor bailout. Nevertheless, a direct default on a bilateral loan would likely be embarrassing politically, particularly as the loans themselves were accompanied by statements of the utmost confidence by those extending them.[11]

[11] Admittedly, bilateral intergovernmental loans are (perveived to be) senior to those underwritten by the private sector. Indeed, the March 2012 haircut on outstanding Greek bonds was entirely shouldered by the private sector. Nevertheless, as the share of Greek debt that is privately held declines, further future haircuts will necessarily have to begin featuring "public sector involvement." Hence, the 2010 decision did put core-country governments on a path to possible direct losses to their taxpayers.

On the other hand, relative to immediate default, there were option-value advantages to a one-year delay. First, some participants may have felt that a new round of negotiations in 2011 might lead to a more realistic stabilization plan for Greece. In such a scenario, default delayed could conceivably turn into default avoided.

Second, and perhaps more importantly, delaying default might allow for possible changes in the cost of default itself. Delaying default would give core-country banking sectors time to reduce their own exposure to Greece. In addition, with luck other peripheral governments would get out of the sphere of contagion in the intervening period.

Third, there might have been a potential blame-shifting value to postpone default. Giving Greece a difficult task and waiting for the inevitable failure to accomplish it, and then blaming the default on Greece's lack of discipline, might have appeared a politically astute maneuver.[12]

In sum, immediate default was clearly (and correctly) perceived to carry unacceptable risks to financial stability in the Euro area, and to the monetary union itself. It was also fiercely opposed by the ECB. On the other hand, a bailout, while creating some novel risks, also brought a number of option-value benefits that might have justified it even if the program was felt to have little chance of success.

C. *Pareto Inefficiency of the Bailout*

Even if it was individually rational for all interested parties to agree to the provisions of the May 2010 bailout, was the deal also *collectively* rational? Is it possible to describe an alternative plan that, for all parties, would have (weakly) dominated the one that was implemented?

In this section, we approach this question from the perspective of a set of benevolent social planners (one for each country) with symmetric and unbiased beliefs. We approximate unbiased beliefs by the view emerging from our reviews of commentary and market reactions to the May bailout, as well as our analysis of precedents for similar stabilization programs. We describe a bargaining outcome as *socially inefficient* if it is not on the Pareto frontier constructed from the objective functions of this set of social planners. Our analysis in this section leads to the conclusion that the May 2010 deal was indeed socially inefficient. In the next section, we reach a similar conclusion for the July 2011 bailout. In Section III we discuss the kind of asymmetries in beliefs and/or political frictions that may have led to these socially inefficient outcomes.

We consider two alternative plans: an orderly restructuring of Greece's debt, and a slower path of fiscal consolidation coupled with more generous financing. We find it difficult to endorse the former as a Pareto superior alternative, but we think that the latter may very well have dominated the plan that was agreed in May 2010.

Alternative 1*: Orderly Restructuring*.—The alternative plan that was perhaps most popular among outside commentators was the idea of an "orderly restructuring" of the

[12] One might also argue that political leaders in 2010 were just trying to shift losses on future leaders, but this seems implausible. The original deal was likely to fail by early 2012 at the very latest (because this is when Greece was to return to private sector borrowing), when both Merkel and Sarkozy were still expecting to be in power.

stock of Greek debt. Under orderly restructuring Greece (potentially assisted by EU institutions) would negotiate with representatives of private creditors an exchange of existing bonds with new bonds, resulting in some combination of: (i) longer maturities, (ii) lower interest rates, and (iii) lower NPV of the principal. Private creditors were expected to be amenable because the alternative—"disorderly" default—was worse. The precedent that was most-commonly cited in support of this solution was the Brady plan, that ended the Latin American debt crisis of the 1980s. Indeed, early failed attempts to deal with that crisis were also cited to criticize the May 2010 plan.[13]

There is no question that a negotiated lengthening of maturities, and a reduction in the NPV of the stock of debt, would have improved Greece's predicament. To be sure, one must not overstate the benefits of this route, or understate the complications. Recall that one of the problems facing Greece is the parlous state of its own banking sector. Since the Greek banking sector was heavily exposed to the Greek sovereign, the reductions in the NPV of their holdings of Greek bonds would likely come back as new liabilities for the government through the back door of needed support for the banks. This indeed has happened with the restructuring deals of 2012, even though a restructuring in 2010 would have required lower support, as foreign private lenders then held a much larger share of Greek debt. In practice, the maximum relief achievable through this means was equal to the share of debt held by foreign private lenders, which at the time was 59 percent.

Furthermore, this deep restructuring would not have freed Greece from its need for official assistance—unless one assumes, implausibly in our view—that the restructuring would have given Greece returned access to private borrowing. Without such an access, Greece would have needed official loans to finance, at a minimum, its still-large primary deficit plus interest payments on the surviving share of debt. Depending on the extent to which it succeeded in lengthening the maturities of the surviving debt, it may also have needed additional support to amortize maturing bills and bonds.

Despite these caveats, and especially with the benefit of hindsight, this deep restructuring-cum-official assistance route would almost certainly have been the best outcome for Greece.

From a Euro zone point of view, instead, whether these benefits of orderly restructuring are worth seeking depends in part on coming to a view on whether and why an orderly default is less susceptible to create a contagion effect than a disorderly one. As noted, a key motivation for the May 2010 bailout was a concern that default would imperil the situation of other peripheral sovereigns. A definitive answer to this question would require a level of understanding about the behavior of financial markets that is currently not available. However, it seems to us that the new information contained in an orderly restructuring is, to a first order, similar to that contained in a disorderly default. Namely, that Euro area government bonds are not riskless and indeed are subject to haircuts. Hence, it is difficult for us to see how one can defend the view that disorderly default would have engulfed other peripheral borrowers in contagion, while orderly restructuring would have had no such spillovers. Indeed, as we discuss below, our own reading of the markets response to subsequent

[13] Particularly authoritative contemporary advocates of an orderly restructuring were, e.g., Buiter (2010a, 2010b) and Nouriel Roubini, "Greece's Best Option Is an Orderly Default," *Financial Times*, June 28, 2010.

attempts to include (orderly) PSI in the solution to Euro area debt crises is that, indeed, they have fueled considerable contagion.[14]

Another argument against ending the "sanctity" of the bonds issued by a Euro area government focused on the impact of such a move on the ability of the ECB to conduct effective monetary policy.[15] Because Euro area financial markets have failed to achieve meaningful integration, each country's financial sector continues to use the rate of return on that country's government debt as the benchmark rate. This means that if one country's sovereign loses the confidence of the markets, the entire economy is dragged into a credit crunch. This makes the ECB fairly powerless to influence monetary conditions in that country, at least with conventional interest-rate tools.[16] As a result, we observe enormous heterogeneity in the effective stance of monetary policy in different countries. Those who made this argument concluded that, not only a sovereign default was fundamentally incompatible with the ability of the ECB to perform its duties, but also that it was imperative to reaffirm the riskless nature of government bonds once and for all.

In sum, we think that an attempt to come up with an orderly restructuring in May 2010 would have improved Greece's own position, but would plausibly have been deemed likely to weaken the prospects of other peripheral governments. In addition, it would have further deteriorated the ability of the ECB to fulfill its duties. It is thus far from obvious that this proposed alternative would have Pareto dominated the plan that was agreed.

Alternative 2*: More Generous Terms*.—A potential set of alternatives would see Greece committing to a slower path of deficit reduction and reform, though of course with the same final goal of debt stabilization. Furthermore, expected return to private borrowing would be set at a later date than envisaged in the May plan. Needless to say both these features would increase the financing gap, so Euro zone partners would need to make larger financial commitments.

The attraction of more generous terms for Greece is self-evident. They would have allowed to spread the pain of adjustment over a longer time span, providing consumption-smoothing benefits. In addition, they might also have shifted some of the adjustment to future periods with more favorable underlying macroeconomic conditions. If thus rendered less painful, the adjustment program may have been less difficult to sell politically, with attendant improvement in the likelihood that it would be carried through.

Greece's increased chances of success would obviously have very desirable spill-overs on the rest of the Euro area. And they could easily be achieved without violating the "painful enough" requirement, so it is implausible that a somewhat more realistic plan would have created moral hazard. If anything, having been given a

[14] For contemporary expositions of the view that restructuring, even if orderly, could lead to contagion effects see, e.g., Bini Smaghi (2010, 2011), Cottarelli et al. (2010), and Orphanides (2011a).

[15] An early very clear exposition of this argument is in Orphanides (2011b).

[16] There are some unconventional tools that can be used, such as the ECB's Long-Term Refinancing Operations of late 2011 and early 2012. Paradoxically, and uniquely, precisely because monetary conditions were deemed quite accomodating in other economies, these unconventional policies were resorted to *before* the policy rate hit the zero lower bound.

more realistic task might have strengthened Greece's resolve to actually implement it. There may well be a "conditionality Laffer curve," which implies that austerity requirements that are too demanding end up inducing less fiscal effort.

The obvious downside to a plan involving more generous terms for Greece is that it put more core-country taxpayer money at risk. However, this objection loses some force when considering that payments to Greece are made in tranches, and can always be interrupted, citing failures of the Greek government to regain fiscal discipline. Indeed creditor countries have routinely delayed the disbursement of tranches. This option of "pulling the plug," common to all conditionality programs, would limit the exposure of official lenders. Furthermore, the expected value of losses faced by lenders are not necessarily increasing in the amount lent. To the extent that a more gradual program has greater chances of success, lending more may lead to smaller losses—another facet of the "Laffer curve" argument made above.

Some may think that more generous terms to Greece would have run into legal constraints, both at the level of the EU and at the level of individual core countries. We present a detailed discussion of the role of treaty provisions and German constitutional rules in shaping the May 2010 deal in the online Appendix.[17] For the present discussion, it is sufficient to point out that the relevant questions of legality, if any, concerned whether bilateral loans among Euro zone members were in violation of EC treaties and/or national constitutional law—and *not* the size of such loans. Hence, if it was legal to lend £22 billion, it would certainly be legal to lend twice or thrice as much.

Example: So far the discussion in this section has been vague about the magnitude of a more generous program that would allow for a more gradual adjustment. To fix ideas, we now briefly consider a specific example. This example corresponds to a "minimalist" alternative plan that calls on Greece to perform the same adjustments as in the May 2010 plan, but delays the return to private borrowing to 2014, rather than 2012. To achieve this, official creditors would have had to cover Greece's funding needs of €68 billion up to the end of 2014 (as estimated in the May 2010 IMF review), and bond redemptions up to the end of 2013 (€153 billion). Greece would then be assumed to roll-over its debt maturing in 2014 (€69 billion). This would have required a headline bailout figure twice as large as the one that was granted, i.e., in the order of €220 billion, instead of €110 billion. Needless to say this is the amount that official creditors ended up committing after the July 2011 plan, as we will see below. In other words our minimalist plan commits official lenders to the same overall amount as the combined May 2010/July 2011 agreements.

This plan is "minimalist" as it does not allow Greece extra time to effect its adjustment. But it is still beneficial to the chances of program success because it makes the program less hostage to a change in market sentiment as early as 2012. As we will see below, perhaps the chief reason for the failure of the first bailout was that by the spring of 2011 it had become clear that Greece would not be able to return to private borrowing as originally envisaged. This triggered a hugely distracting and

[17] Our main conclusion is that such legal constraints were largely not binding for the substance of the May 2010 agreement—though they may have played a more significant role in other aspects of the broader strategy to deal with the Euro zone crisis.

time consuming round of renegotiations with official creditors, which slowed down the pace of reform and soured the political mood both in Greece and in core countries. Without this costly distraction it is conceivable that the Greek government may have managed to keep the momentum for its adjustment and reform program which, as we will see, had been largely on track up to the time where the impossibility of returning to the markets became evident.

II. The Second Bailout

A. *Road to the Second Bailout*

Despite the early pessimism, things initially went as planned in the May 2010 agreement, and for the rest of 2010 it looked like Greece might succeed in eventually stabilizing its debt/GDP ratio without a default. A large number of fiscal provisions and other reforms were implemented by the Greek government, and the IMF and the European Commission issued a sequence of favorable reports on the implementation of the deal. In early 2011 Greece was still judged to be substantially on track to meet its deficit targets. Several bailout tranches were duly paid out. Remarkably, Greece was able to issue €5.7 billion of bonds with maturity up to three years in the period October 2010–March 2011. The more positive outlook precipitated a steady decline in Greece's bond yields until mid-October.

Unfortunately, such optimism begun evaporating in the first months of 2011. Three factors contributed most to the growing realization that the May plan would have to be revisited.

First, Eurostat published a revised estimate of the 2009 deficit which placed it at 16 percent of GDP, or 2 percent higher than it had been thought to have been in May. To appreciate the full impact of this discovery it is important to note that the bailout agreement expresses targets in terms of the *level* of the deficit/GDP ratio, not the change. Hence, a fiscal contraction in, say, 2010, deemed to be sufficient to reach targets if the initial deficit level is 14 percent, is no longer sufficient if the starting point turns out to have been 16 percent.[18]

Second, and most pernicious, yields across the Euro zone increased sharply on the infamous "Dauville announcement," by Chancellor Merkel and President Sarkozy, who said that crises after 2013, would involve "necessary arrangements for an adequate participation of private creditors." This intent was perceived to be enshrined in the language with which the EC created the European Stability Mechanism (ESM) in March 2011, resulting in persistently high spreads over bunds for all peripheral countries, and foremost for Greece.

[18] There is an interesting discussion to be had on the rationale for couching bailout agreements in terms of deficit/GDP targets rather than in terms of changes to the absolute value of the deficit. Targeting levels rather than changes means that the recipient of the bailout carries all the risk from data revisions. Targeting the ratio of the deficit to GDP rather than the absolute level of the deficit means that the recipient of the bailout carries all the risk from fluctuations in the growth rate. In IMF-led bailouts such asymmetric allocation of risks may be of relatively little consequence as the IMF has the flexibility to renegotiate relatively easily and frequently. But for a bailout involving a large number of creditors renegotiation is immensely costly and slow, as the events we are about to recount demonstrate, so the recipient of the bailout does effectively carry a disproportionate share of the risks.

Third, beginning in March serious slippages in Greece's implementation began to appear. This severe slackening likely reflected a variety of reasons. To some extent it may have been part of a "chicken game" vis-à-vis the Euro zone partners, to put pressure on them to come to a quicker resolution of the new bargaining round. It could also be that, while there was uncertainty on whether a new bailout (which was essential to avoid default) was forthcoming, the political cost of implementing reforms that may later appear to have been pointless was perceived as higher. In addition, the program for 2011–2013 was emphasizing structural reforms and privatization, which are politically harder to implement than fiscal contraction.

These factors implied that Greece was no longer meeting its reform and stabilization targets *and* that it was not going to regain access to private funding by the time envisaged in May 2010. In other words, the May plan was now "officially" outside the feasible set.

The new round of bargaining took extremely long, and only came to fruition in July 2011, some six months after it had become clear that the original plan would not work. We conjecture that there were two (related) reasons for the long delay in coming to a new agreement. First, the surplus from avoiding default must have been felt to have shrunk. Clearly any agreement would have had to have a combination of more aggressive fiscal tightening for Greece, and additional financial assistance from the rest of the Euro zone, making an agreement correspondingly costlier. On the other hand, the costs of a default had arguably not changed very much, so the surplus was smaller. Second, with a smaller surplus on the table, participants naturally looked for additional margins of adjustment. Germany in particular begun arguing for forms of reduction in the value of debt held by private creditors.[19] This attracted fierce opposition from the ECB, and the bargaining became all the more complicated and sluggish.

Eventually the agreement of July 2011 featured concessions on all three sides: Greece agreed to an even tougher austerity and reform program, including the disposal of large numbers of state-owned assets; countries in the Euro zone (through the recently created European Financial Stability Facility, or EFSF) committed to a new €109 billion in bailout funds, and the ECB had to acquiesce to an element of PSI.

B. *Evaluating the Second Bailout*

Our evaluation of the July 2011 bailout is similar in many respects to the one for the May 2010 bailout. First, it seems quite clear that the actions to be undertaken were outside of the feasible set. The last column of Appendix Table A1 shows changes in the primary deficit called for by the plan in each of its years. The new plan calls for two consecutive years of massive fiscal adjustment, a feat rarely encountered in previous successful large austerity programs. There is only one precedent of a country

[19] Germany's greater willingness to contemplate PSI to a Greek bailout may have been partially due to the exposure to Greece of German banks having fallen from \$60 billion to \$25 billion between May 2010 and July 2011 (foreign claims fell from \$31 billion to \$21 billion and exposure to Greek government bonds fell from \$23 billion to \$12 billion). It is also the case that while CDS spreads on Greece, Portugal, and Ireland had increased dramatically since late 2010, those on all the other Euro zone countries had fallen slightly. This may have led Germany to underestimate the risk of contagion.

succeeding in implementing an average annual primary-deficit reduction larger than the one Greece was to undertake, and none that has achieved a comparable cumulative reduction over a similar number of years. Recall that the comparison programs are the most aggressive on record in the OECD in the last 40 years. Meanwhile, the overall macroeconomic and political backdrop had, if anything, further deteriorated, as can be seen in the last columns of Appendix Tables A2 and A3.

Second, it is probably still possible to build an option-value case for the individual rationality, for each participant, of accepting the deal instead of walking away from it. This case would have many similarities with the cases made in respect to the 2010 agreement, so it will not be made here to avoid repetition.

Third, from a collective standpoint the July agreement appears even more suboptimal than the May one. One reason for this is similar: as the July plan was more clearly unfeasible, the case for the superiority of a deal allowing Greece more time and a more gradual adjustment, so as to bring it on the left side of the conditionality Laffer curve, is even stronger. Another reason is novel to the July agreement: the inclusion of the PSI component. Because this is the novel element, we focus the rest of the discussion on it.

The agreement committed Greece to open negotiations with representatives of private lenders to achieve a voluntary reduction in the value of the debt of approximately 20 percent.[20] Needless to say, by specifying a target haircut of 20 percent, the agreement effectively made it an upper bound on the size of the equilibrium outcome. With a publicly stated goal of 20 percent, the Greek negotiators could hardly have picked an initial negotiating position of, say, 50 percent. Hence, it was built into the bailout agreement that the haircut on private holders was to be between 0 and 20 percent. As private creditors (ECB excluded) held an estimated 58 percent of the overall stock of Greek debt outstanding, the absolute upper bound on the debt relief that might come from the deal was a 12 percent reduction of the debt/GDP ratio (20 percent $\times$ 58 percent). The midpoint of the bargaining range would have delivered a 6 percent reduction. In other words, the PSI component of the deal was little more than symbolic, and provided no meaningful debt relief.

Despite the symbolic impact of PSI on the NPV of Greek debt, some commentators saw some benefits in the plan because private creditors were expected to swap existing claims on Greece with ones bearing a longer maturity. As a consequence, a certain amount of bonds originally due to mature between 2011 and 2014 would now mature at later dates. This lengthening was argued to be beneficial to official creditors, because, under expectations prevailing in July 2011, it would have been difficult for Greece to persuade private creditors to rollover expiring bond issues (at acceptable rates) over this period. Hence, in the absence of the bond swap, official creditors would have had to commit even more funds to the July bailout, in order to provide for the amortization of maturing medium- and long-term debt held by the

[20] The actual provisions for PSI in the Statement issued by the EC at the end of the meeting are quite ambiguous. Point 5 refers to a "net contribution of the private sector.... estimated at 37 billion euro." However footnote 1 also says "For the period 2011–2019, the total net contribution of the private sector is estimated at 106 billion euro." The 20 percent figure emerged from subsequent commentary and debriefings. Since PSI had to be negotiated with private creditors anyway, specific figures in the Statment were little more than opening bids in the negotiations. For more details see the Appendix, as well as Zettelmeyer, Trebesch, and Gulati (2012).

private sector. According to this view keeping this debt in private hands was a way to retain the option value of bailing in private creditors in the future.

As we discuss in greater detail in the Appendix, there are two sets of reasons why these arguments don't bear scrutiny. First, the debt swap had to be voluntary, and there was immediate considerable skepticism on the extent of take up. Second, and most importantly, the debt swap had a number of adverse consequences which made its *net* impact on Greece's financing needs between 2011 and 2014 much smaller than its gross impact suggested—if not indeed negative. These costs included the necessity of recapitalizing Greek banks for their NPV losses on their huge holding of Greek government bonds, the costs of financing a "credit enhancement program" in which the new bonds issued by Greece would be guaranteed by AAA-rated bonds issued by the EFSF, and several others. Indeed the swap floundered in the end for lack of clarity on the terms, lack of interest, and dawning realizations that the costs the swap entailed dwarfed the benefits in terms of longer maturities.

On the other hand, there are clear indications that the presence of a PSI component in the July agreement increased the costs and the complication of the broader European debt crisis. It seems likely, for example, to have been a significant factor in dragging Italy into the crisis in the late Spring and Summer of 2011. As we show in the online Appendix, the yield on five-year Italian bonds, which had been quite stable over the months of May and June, rose dramatically in the run-up to the EC council. As we also document, the early part of July saw an acceleration in the number of officials publicly predicting that the July EC meeting would agree to include some form of PSI. Hence, a possible interpretation of this spike in Italian spreads is that it reflects pricing-in of the contagion from Greek PSI.[21, 22]

With the third biggest economy of the Euro zone engulfed, the extent of the existential threat to the Euro project rose to a whole new level. Since PSI provided no meaningful benefits in terms of debt reduction, and plausibly caused considerable havoc through contagion, it seems that not having included PSI in the final deal might have been Pareto improving. EC President Herman van Rompuy summed this up on December 9, 2011, when he said "As regards the Private Sector Involvement (PSI), we have made a major change to our doctrine: from now on we will strictly adhere to the IMF principles and practices. Or to put it more bluntly: our first approach to PSI, *which had a very negative effect on the debt markets*, is now officially over." [23, 24]

[21] To be sure the hypothesis of a PSI component had been on the table since well before July—early June at the latest. But it was only in early July that it became clear that PSI was more likley than no PSI.

[22] Admittedly yields fell for a day or two upon the bailout announcement. However throughout the crisis it has been common for spreads to decline for a couple of days after a major EC council, possibly in response to EU leaders' triumphal announcements that the crisis has been comprehensively dealt with for good. Reality apparently sinks in with a few days' lag.

[23] http://www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/ec/126657.pdf. Emphasis added.

[24] To be clear, we are not saying that zero PSI would have dominated any amount of PSI. A meaningful PSI component which would have truly reduced the present value of the debt could concievably have made at least some participants better off than no PSI at all. We are simply saying that no-PSI dominates purely symbolic PSI.

III. Understanding Suboptimal Deals in the EU

We have argued that the May 2010 and July 2011 decisions were socially inefficient, in the sense that a set of benevolent planners (one for each country), all sharing the beliefs expressed by the vast majority of commentators and analysts at the time, would have been made better off by deals allowing more time to Greece, and (in the case of the 2011 bailout) no PSI component.

It is conceivable that some of the key political players held more optimistic beliefs than the experts and the other parties to the deal. When bargaining parties hold biased or heterogeneous beliefs, the relevant notion of a Pareto frontier takes these beliefs into account. On the "perceived" Pareto frontier no party can be made to *perceive* himself to be made better off (based on *his* beliefs) without having another party *perceive* herself to be made worse off (based on *her* beliefs). Parties may well succeed in bargaining to the perceived Pareto frontier, but clearly they will not typically seem to have reached the Pareto frontier as defined by a common and unbiased set of beliefs. If, for example, Chancellor Merkel felt that it was economically and politically feasible for Greece to implement the May 2010 program, we would have a rather simple explanation for the social suboptimality of the observed outcome.

While we don't categorically rule this possibility out for the May 2010 agreement, we are skeptical about its applicability to the July 2011 one. At that time, the unrealistic nature of the paths laid out for Greece had to be apparent to all. Furthermore, given the widespread public commentary on PSI in the months and weeks before the July deal, it seems implausible that the German party did not understand that the symbolic PSI provided no material benefits in terms of alleviating Greece's funding needs (and hence official creditors involvement). Hence, as long as they put a strictly positive estimate on the probability of contagion from PSI (however small) they should have preferred no PSI to symbolic PSI.

We therefore turn to discuss possible *political frictions* that could have contributed to moving the bailout agreements inside the (social) Pareto frontier.

A. *Voter Intransigence*

The simplest political friction capable of pushing bargaining among EC members inside the Pareto frontier is a version of the asymmetric-beliefs story, but applied to voters rather than to leaders. Consider the 2010 bailout. Perhaps core-country voters then underestimated the severity of Greece's financial and economic position, and overestimated the chances of success of the tough program that was agreed. More generous terms would have been perceived as putting more of their money at risk than necessary, and perhaps also providing bad incentives to Greece and other peripherals. These perceptions being too entrenched for political leaders to modify through persuasion, they ended up constraining the set of politically feasible bailout packages. In this view, then, in May 2010 and July 2011 core-country leaders did "the best they could do" given political pressure at home to strike a tough bargain. They knew that they would have to do it all over again in about one year, but they hoped that, at that junction, German voters would have been "educated" by the failure of the previous years' program, and would thus be willing to accept an expansion in commitments that they would have fiercely resisted on the previous round.

One could argue that, if this was the signatories' thinking, the plan did not quite work. Under the plan outlined above, German voters' attitudes to Greece should have softened between the first and the second bailout, as voters learned of the true plight of the Greek economy and the harshness of the consequences of the program on the Greek people. Instead, attitudes towards Greece seem to have hardened. On April 28, 2010 (eve of the first bailout) 49 percent of respondents said "yes" to the question "Should Greece be excluded from the Eurozone?," while on June 18, 2011 (just before the second) the "yes" answer had risen to 58 percent![25] This is an ex post outcome, however, and does not rule out the possibility that political leaders may have hoped ex ante for a different evolution of voters' attitudes.

A somewhat stronger objection to the argument that voter intransigence was a binding constraint is that Chancellor Merkel was not up for reelection until September 2013. It may be that more generous terms in May 2010 would have damaged her short-run popularity, but her goal should have been to maximize support three years later. Arguably, this goal would have been better served by presiding over a single successful bailout (however unpopular it may have been at the time), rather than a series of botched ones, particularly as the latter path involved cumulative commitments to Greece (as of 2013) at least as large as under the former, lower overall chances of program success as of 2013, and all the reputational costs implied by having repeatedly subscribed to doomed deals between 2010 and the time of the election. To this, however, one could respond that the Chancellor was concerned with the outcome of state elections (seven in 2011, three in 2012), and in particular that her party (and her coalition partner) might be punished at the state level for bailout terms seen as too generous. It is difficult to rule out with confidence that concern with short-term state-level outcomes would be sufficient to overcome the longer-term considerations applying to the 2013 federal elections.

In the end, perhaps the most important question regarding the voter-intransigence interpretation is whether it is plausible that the political cost of bailing out another country would be very sensitive to the *size* of the bailout. Voters, even sophisticated ones, become fairly insensitive to figures that are orders of magnitude outside their practical experience. Some voters are clearly hostile to the idea of bailing out Greece. But conditional on a bailout taking place, one may doubt that they will scrutinize the exact amount carefully. Had a core-country head of government come out of the bargaining room with an announcement that she had committed €44 billion rather than €22 billion, would she really have borne a much larger loss in popularity?

[25] In the one intervening poll in January 2011 the percent yes was down to 40 percent. This could reflect the good start Greece had had on the first program, or the fact that the January poll had been conducted by Allenbach, while those in April 2010 and June 2011 were by Infratest-Dimap, raising the possibility of differences in polling methods (Allenbach tends to have much higher proportions of "don't know"s). There are many other German opinion polls regarding Greece, and the Euro crisis but very few questions are consistently repeated with the same wording over a time span covering both bailouts. The one on Greece's exclusion seems to be the only exception.

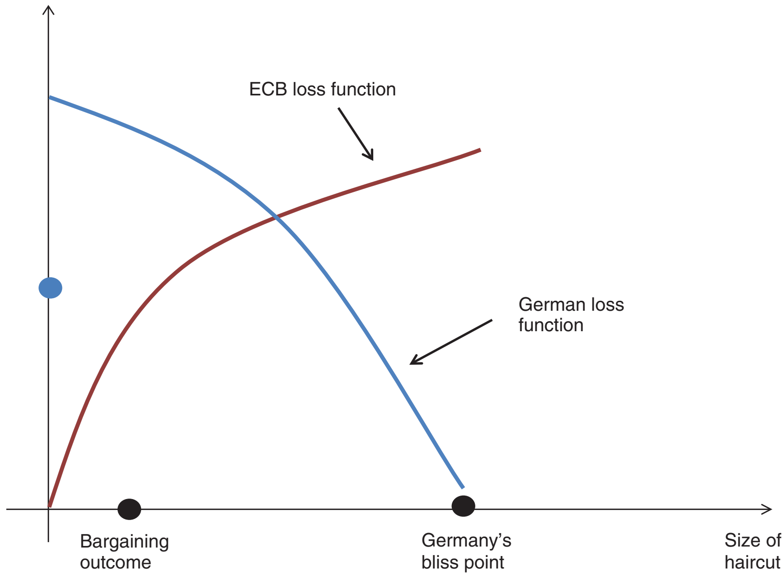

Figure 1. Negotiation with Nonsingle Peaked Preferences

B. *Communication Frictions*

In order to discuss the second political friction that could explain suboptimal EC bargaining outcomes we focus, for concreteness, on the symbolic PSI component of the 2011 agreement. On this dimension, we believe that the "objective" payoff functions of the key players can plausibly be assumed to take the forms shown in Figure 1. On the horizontal axis we measure the size of the haircut to be negotiated with the private creditors. On the vertical axis we measure the loss functions of a typical core country (henceforth Germany, for brevity) and of the ECB. The ECB simply wants as little haircut as possible, so its loss function is monotonically increasing. Germany would like to get the private sector to share in the burden, so we assume that its loss function is globally minimized at some significant level of the haircut, denoted "Germany's bliss point" in the figure. Germany's loss monotonically increases as the size of the haircut diminishes. However, our discussion above implies a discontinuity at the origin. Because of the negative effects the symbolic PSI provisions had on other peripheral countries, a zero haircut is discretely to be preferred to a purely symbolic but strictly positive haircut. In other words, no PSI whatever is a local minimum in Germany's loss function—and more generally Germany's preferences are not single peaked. In the figure we have also denoted by "bargaining outcome" the empirically observed outcome, of a very small, symbolic haircut.

The mechanism we wish to discuss is based on a plausible friction in communication between politicians and voters. Some background on context is in order before describing our hypothesis. EU summits, at least in crisis periods, are focal political events that are eagerly anticipated. In the weeks leading to each summit there is pervasive coverage and extensive public commentary on the possible and/or desirable outcomes. In such a climate, heads of governments and their spokespersons are under intense pressure to comment on their goals and strategies. Some of them are even required to report to Parliament on their negotiating position in the upcoming meeting. Needless to say, such public presummit positioning has important implications for the head of government's negotiating stance. It implies that her performance will be judged by voters on the distance between the bargaining outcome and her stated bargaining goal, giving her powerful incentives to negotiate hard for her stated position. Indeed, it is very likely that some leaders use such public pronouncements simultaneously as a commitment device and a signalling tool to other leaders. By publicly stating their negotiating position they make it costlier for themselves to fail to achieve an outcome close to it. Not only this strengthens their own resolve but also increases their bargaining power, as other governments now know that for this head of government the cost of scuppering a deal relative to accepting one that is distant from her preferred option are relatively small.

Imagine now that there is some communication friction which implies that political leaders can only convey fairly simple messages to voters concerning their negotiating strategy. This does not have to be due to voter irrationality or lack of sophistication, though these are undoubtedly plausible assumptions in their own right. It could be that voters have rational inattention towards politics, hence devoting only limited scarce cognitive resources to it. Or it could be that voters rationally distrust excessively complicated messages as they believe that they could be used by politicians to inject noise in their assessment of the politician's performance.[26]

Under such communication and/or cognitive frictions it is likely that heads of government will tend to limit the amount of information contained in their presummit statements. In particular, a plausible working hypothesis that also seems consistent with casual observation is that such statements will be limited to descriptions of the head of government's ideal point, and not of the entire profile of her loss function. Similarly, it is very likely that voters will automatically assume that the objective function is single peaked, and will judge the outcome strictly in terms of its distance from the stated ideal point. In most cases single peakedness is probably a good assumption, so this heuristic is a reasonably efficient way to deal with communication frictions between politicians and voters. However it is immediately apparent that when single-peakedness is violated constraints on communication can become quite costly. In particular, knowing that she will be judged by voters on the distance of the negotiating outcome from the ideal point, the head of government who is (sufficiently) concerned with her electoral prospects might act to minimize that distance. With a non single-peaked loss function this is not the same as minimizing the loss.[27]

[26] There is a literature on communication frictions between politicians and voters (e.g., Cukierman and Tommasi 1998a, 1998b) but we are not aware of models in which these take the form of constraints on the form of the messages that can be sent. However, in the "cheap talk" literature there is a tradition of formulating models where senders are limited to "coarse" messages, for example announce a discrete interval rather than a specific real number, and some of these tools may be relevant to model the mechanism we are sketching (e.g., Crawford and Sobel 1982; Austen-Smith 1990, 1993).

[27] To some extent this mechanism is also vulnerable to the objection that elections were not due until 2013. But the critique does not apply as strongly, because—in the game we described—the voters are not only learning about the fundamentals of the Euro crisis. They are also making inferences about their head-of-government's type, particularly as regard her toughness and effectiveness in multilateral negotiations. Because high-stakes multilateral bargaining sessions are infrequent, there are relatively few such learning opportunities, and "success" at one such meeting could have persistent effects on a leaders' perception by the voters.

In the online Appendix we provide a broad overview of public statements by European political leaders in the months and weeks leading up to the July 2011 agreement. Consistent with the discussion above, we find that Germany was deeply committed to PSI going into the negotiations, suggesting that a deal not including some amount of PSI would be politically quite costly to the Chancellor. For example, speaking on July 17, Chancellor Merkel was in no doubt that private investors would share some of the burden of the new deal for Greece: "The more we can involve private creditors now on a voluntary basis, the less likely it is that we will have to take next steps, … But most important is that Greece does its homework and private creditors have to be involved." On the other hand, throughout the negotiations, the ECB maintained its firm resistance to a credit event of any form, instead insisting greater government financing should be provided. This was clearly expressed during an early July press conference by Trichet with the remarks, "no credit event, no selective default, no default. That is the message of the Governing Council."[28] In an interview with FT Deutschland on July 14, presumably directed at a German audience, the President of the ECB explains further: "If a country defaults, we will no longer be able to accept its defaulted government bonds as normal eligible collateral." "The governments would then have to step in themselves to put things right." He also criticized politicians' lack of "verbal discipline" in reference to their mixed signals in public.[29]

C. *Bargaining Frictions*

A third possible explanation for suboptimal bargaining outcomes in the EU is based on the dynamics of bargaining with a time limit. To motivate this conjecture it is important to recall that ECOFIN and EC meetings, where key decisions are ironed out, are infrequent and time-limited affairs. A typical meeting will begin with a meal and go on until an agreement is reached or the meeting is broken up. If the matter is relatively uncontentious and the key points have already been agreed in advance by the diplomatic staff the meeting is simple and brief, and mostly an opportunity for communication with the voters. However, on difficult and controversial matters the meeting is a true "end game" negotiating session. Ample anecdotal evidence indicates that as the negotiations continue over many hours tiredness and personal animosities among the heads of government become meaningful factors in the negotiation process. Similarly, anecdotally it appears that negotiations are sometimes concluded not so much out of a feeling of having achieved the best possible deal but out of sheer exhaustion and/or impossibility to overcome hardened attitudes.

It should be possible to conceptualize the bargaining process in a way that makes some sense of these anecdotes. Consider the following bargaining protocol. At the beginning of the bargaining session a "political auctioneer" asks all participants to state their most preferred outcome. For Germany this will be, say, a 70 percent haircut on private creditors, while for the ECB it may be no haircut at all. The political auctioneer then tables a proposal that is a convex combination of each participant's most preferred outcome, with weights equal to each participant's bargaining

[28] See transcript of July 7, 2011 press conference.
[29] See Reuters article, *Trichet: ECB would reject Greek bonds as collateral*.

weight (assumed to be known to the auctioneer). Hence, for example, if the ECB has a large bargaining weight on the issue of PSI, the auctioneer will table a proposed haircut that is between 0 and 70 percent, but closer to 0 than to 70 percent.

Once again, in most cases it is likely that participants have single-peaked preferences, and under single-peaked preferences this bargaining protocol generates a Pareto efficient proposal. It is therefore plausible that negotiations will follow this protocol in general, and will often quickly converge to outcomes on the Pareto frontier. However occasionally some parties to the negotiation will have non single-peaked preferences and in these cases clearly the proposal of the auctioneer is inefficient. It may be that this inefficiency will be felt by the participants but it is also likely that this will lead to a time-consuming search for a better deal. Furthermore it seems likely that the auctioneer will for a considerable time continue to search in the interior of the set delimited by the participants' ideal positions, perhaps because it attributes the failure of the first proposal to private information on the value of outside options and hence bargaining power. To be sure, should the search process be allowed to continue indefinitely it is likely it will lead to the discovery of a Pareto efficient deal. But, as discussed above, the bargaining session is time limited, as exhaustion, bad feelings, or important commitments back at home make it necessary to break off the session. The time at which the session must end may well be a random variable, but this does not change the reasoning. When the time to end the session comes, the entire negotiation boils down to a "take it or walk away" decision by each participant, where "it" is the latest iteration in the search for a deal. If the end time comes too early, the deal on the table will still be inside the Pareto frontier. As we discussed, "take it" can dominate "walk away" for everyone even if "it" is not on the Pareto frontier.[30]

Clearly this mechanism presumes an element of asymmetric information, in that the political auctioneer that generates proposals must have noisy information on the shape of the various parties' loss functions. Otherwise it would be able to identify the Pareto frontier. Limits on information on the part of the auctioneer can persist because participants have an incentive to hold out for a better deal. For example, Germany prefers no PSI to symbolic PSI, but does not wish to reveal this because it hopes the auctioneer's next iteration will be "to the right" of the current proposal. Hence, the mechanism combines elements from the literature on *deliberation* (e.g., Austen-Smith and Feddersen 2005, 2006; Coughlan 2000; Eliaz, Ray, and Razin 2007; Gerardi and Yariv 2007, 2008; Meirowitz 2006; Persico 2004; and Lizzeri and Yariv 2012) with elements from the literature on *wars of attrition* (e.g., Alesina and Drazen 1991; Drazen and Grilli 1993; Ponsati and Sákovics 1996; Hsieh 1997). The former literature is relevant for its emphasis on how protocols for committee decision-making affect decision outcomes, while the second literature shows how asymmetric information leads to delays in bargaining.[31]

[30] The conjectures above are mainly inspired by anecdotal newspaper accounts (based on participants' leaks) of the dynamics of EU summits. Additionally, they may be influenced by a dozen-year experience of attending faculty meetings.

[31] In the deliberation literature the most relevant contribution is Lizzeri and Yariv (2012) which studies *sequential deliberation*: a jury decides every period whether to keep sampling information or stop deliberation and make a decision based on the information hitherto uncovered. But in their paper there is no time limit to the possible length

Notice that the mechanism outlined above encompasses the possibility of a role for asymmetric beliefs among the participants. As already implicit in our discussion so far, there was sharp disagreement among commentators on the gravity of the contagion risk from orderly default/PSI. It seems possible that similar disagreements existed among the parties to the July agreement. In particular, the ECB (together with most peripheral governments) was clearly extremely worried about contagion, while is seems possible that Germany felt it to be less likely. These differences in beliefs could undoubtedly have contributed to shaping the objective functions that Germany and its counterparts brought to the negotiating table, i.e., they made Germany broadly more "pro-PSI" and the ECB and others more "anti-PSI." However, as discussed above, differences in beliefs alone do not seem to be sufficient to explain the suboptimal outcome in question.

IV. Conclusions

This paper has focused on the political economy of Euro zone bailout agreements. It has looked at the cases of the May 2010 and July 2011 bailouts of Greece. In both cases accepting the conditions of the agreement, rather than walking away and triggering an immediate default by Greece, can plausibly be argued to have been individually rational for each of the parties. However we find it harder to argue that the two agreements were also collectively rational. In both cases, giving Greece more time to reduce the deficit before returning to borrowing on private markets might have increased the chances of success of the stabilization program, at no large increase in the political or financial cost borne by the lenders. Furthermore, in the case of the July 2011 agreement, omitting the symbolic PSI element would have reduced the likelihood of contagion to other Euro area peripheral countries, without materially increasing the financial burden on official creditors.

We have sketched some possible arguments for why EU-wide bargaining could lead to inefficient outcomes. Among these, the two we found to have most potential rely on the existence of non single-peaked objective functions for at least some of the participants. In one argument this non single-peakedness interacts with the infrequent and time-constrained nature of EU negotiations (which is due to the difficulty of bringing together 27 heads of government and assorted heads of European institutions for more than a few hours every few months). In these negotiations, a "political auctioneer" will tend to search for deals that are convex combinations of the participants' ideal points. Under non single-peakedness and time-limited search this will tend to produce outcomes that are acceptable relative to walking away, but inside the Pareto frontier. In another argument non single-peakedness interacts with communication frictions that limit the ability of heads of state to provide accurate descriptions of the entire profile of their loss functions. This induces voters to judge the negotiating

of deliberation. More importantly, there is no fundamental conflict of interest on the final outcome, nor asymmetric information on the preferences of members of the jury. These features are, of course, central to war of attrition models, which offer endogenous mechanisms that generate delay in solving problems. Another paper that offers a relevant ingredient is Eliaz, Ray, and Razin (2007), who emphasize how members of the decision-making body may decide to accept a feasible (but for them suboptimal) outcome of the deliberation rather than having "disagreement," i.e., a collapse of decision making equivalent to our "walk away" option.

outcome on the basis of its distance from the global minimum of the loss, rather than based on the realized value of the loss. Electoral considerations imply that the head of government inherits this monotonicity in shaping her attitudes during the negotiation.

It is useful to contrast these mechanisms with the situation that arises in "normal" bailout situations, where the emergency lender is the IMF rather than the European Council. It is not the case that the IMF's loss function is necessarily always single peaked, though we suspect this is likely to be the case more often. The main difference is that neither the problem of infrequent and time-limited negotiations nor the problem of communication with domestic electorates is particularly relevant in the case of the IMF. As already mentioned, the IMF is able to renegotiate often and at leisure, while the 27 heads of state can only meet infrequently and for a few hours. This makes it much easier for the IMF and its partners to search exhaustively for a solution on the Pareto frontier. Similarly, the IMF is not compelled to make public announcements of its "game plans" to its constituency before opening discussions, nor is it forced by communication frictions with voters to oversimplify its negotiating position. In other words, domestic political considerations are paramount in EU bailouts, but not in IMF ones. If the EU is bent on continuing to take the lead in future bailouts it should give careful considerations to ways to limit the pernicious effects of these frictions.

Appendix

A. *Assessing the Feasibility of the May 2010 Program*

Did the May 2010 agreement commit its parties to feasible actions? In particular, given the severity of the austerity program it asked Greece to implement, was the plan a realistic one, on an ex ante basis? Any answer to this question is necessarily highly speculative, but this section takes a rough stab at it. In Table A1 we report data from the eight largest fiscal adjustments in OECD countries since the 1980s, as well as Greece's previous stabilization in the early 1990s.[32] For each episode, each column shows the *percentage-point change* in the *primary* deficit achieved in each year of the program. It also shows the average annual and cumulative percentage change in the primary deficit, and (implicitly) the program duration. In the penultimate column, we present equivalent numbers for the May 2010 austerity program. Note that while the figures in the first eight columns are ex post numbers, i.e., they reflect adjustments that were actually achieved, the column for Greece reports ex ante numbers, i.e., what was expected of Greece going forward.

The overall impression from Table A1 is that the austerity program that Greece was called on to implement by the May 2010 agreement was tough but not unprecedented. The numbers for the Greek plan are of comparable magnitudes to those of these

[32] The table shows the largest eight episodes of cumulative reduction in the primary deficit/GDP ratio in a sample of 20 OECD countries from 1970 to 2010. We consider episodes of fiscal tightening all years in which the primary deficit/GDP falls. We cumulate the decline in the primary deficit over consecutive years in which it falls. Note that we would select a similar set of countries/years if we used a measure of cyclically adjusted primary deficit/GDP ratio to select episodes of fiscal tightening. Countries included in the sample are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, New Zealand, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States. The methodology is quite similar to the one used in Alesina and Ardagna (2009) in their study of the determinants of success in fiscal consolidations.

Table A1—Percent Point Reduction of Primary Deficit/GDP in Largest Episodes of Fiscal Adjustments in OECD Countries and in Greek Programs

	NLD 1996–2000	BEL 1984–1990	UK 1994–2000	DNK 1983–1986	SWE 1994–1998	CAN 1993–1997	IRE 1987–1989	FIN 1994–1998	GRC 1990–1994	May-10 GRC 2010–2015	Jul-11 GRC 2010–2015
T	7.3	4.6	1.3	4.0	2.9	0.4	2.0	3.0	0.4	6.2	5.4
T + 1	0.4	0.9	1.4	5.6	1.1	1.9	3.3	0.4	3.8	1.5	4.0
T + 2	0.2	0.4	1.7	2.5	4.4	1.9	1.3	3.2	0.5	1.9	2.4
T + 3	0.9	1.7	2.0	4.8	2.0	2.1		2.5	-0.1	2.1	2.3
T + 4	0.9	0.5	2.0		2.1	2.4		2.7	4.7	2.8	2.1
T + 5		1.0	0.5							0.1	2.8
T + 6		1.2	2.6								1.3
Mean	1.9	1.5	1.7	4.2	2.5	1.7	2.2	2.4	1.9	2.4	3.0
Cumulative	9.7	10.2	11.6	17.0	12.4	8.7	6.7	11.8	9.3	14.6	18.0

Source: OECD Economic Outlook and IMF

very large adjustments, and correspondingly call for a vast effort. But there is no dimension of the program that appears to be an outlier. There are countries that have had larger average annual and cumulative percentage-point declines in the primary deficit, larger declines in individual years, more front-loaded, and longer programs.

However in order to fully evaluate the feasibility of the program it is also important to look at the macroeconomic context in which the program is to be implemented.

The real GDP growth experiences during the previous adjustments are presented in Table A2 together with the IMF forecasts for Greece's growth during its adjustment. The majority of the previous adjustments took place with strong average annual growth in excess of 3 percent. The May 2010 forecast for Greece's average annual growth is lower than any of the realized average growth rates in previous adjustments. Only the Greek fiscal adjustment of 1990–1994 had a somewhat comparable stagnant average annual growth rate, but it is perhaps also important to note that Table A2 does not show the fall of Greece's real GDP in 2009, the year immediately before the start of the adjustment.[33] Certainly no previous adjustment of this scale had commenced in the middle of a 3-year long recession with an 8.4 percent peak-to-trough contraction as had been forecast at the time. Even if the more solid growth in the later years of the adjustment had materialized, Greece's real GDP would still have been lower in 2015 than it had been at its 2008 peak.

Table A3 analyzes the timing of the adjustments in the context of respective business cycles. A similar pattern to Table A2 emerges, with the majority of the previous adjustments taking place as the output gap increases from start to finish. These adjustments therefore took place when the economy was either in the recovery phase or the boom phase of the business cycle, which contrasts starkly to the timing of the 2010–2015 Greece adjustment which was to take place in the opposite circumstances. The forecasts for both the average annual decline and the total decline in the output gap under the May 2010 program were at least twice as great as the only other adjustment with a negative change, Greece 1990–1994.

[33] At the time of the May 2010 Country Report, the 2009 GDP growth was given as −2 percent but this has since been revised to −3.3 percent. See Hellenic Statistical Authority Press Release 05-10-2011 for more details on Greece's GDP revisions 2005–2011.

Table A2—Realized and Forecast Real GDP Growth Rates in the Largest Episodes of Fiscal Adjustments versus Greek Programs

	NLD 1996–2000	BEL 1984–1990	UK 1994–2000	DNK 1983–1986	SWE 1994–1998	CAN 1993–1997	IRE 1987–1989	FIN 1994–1998	GRC 1990–1994	May-10 GRC 2010–2015	Jul-11 GRC 2010–2015
T	3.4	2.1	4.3	2.7	4.0	2.3	3.6	3.6	0	−4.0	−4.5
T + 1	4.3	1.8	3.1	4.2	3.9	4.8	3.0	4.0	3.1	−2.6	−3.9
T + 2	3.9	1.9	2.9	4.0	1.6	2.8	5.6	3.6	0.7	1.1	0.6
T + 3	4.7	2.4	3.4	4.9	2.7	1.6		6.2	−1.6	2.1	2.1
T + 4	3.9	4.6	3.8		4.2	4.2		5.0	2	2.1	2.3
T + 5		3.6	3.7							2.7	2.7
T + 6		3.1	3.9								
Total growth (index, T − 1 = 100)	121.9	121.1	127.9	116.7	117.6	116.8	112.7	124.5	104.2	101.2	99.0
Average annual growth	4.0	2.8	3.6	3.9	3.3	3.2	4.1	4.5	0.8	0.2	−0.1

Note: Shaded cells denote IMF forecasts.

Source: IMF

Table A3—Output Gap (*percent of potential output*) Change in the Largest Episodes of Fiscal Adjustments versus Greek Programs

	NLD 1996–2000	BEL 1984–1990	UK 1994–2000	DNK 1983–1986	SWE 1994–1998	CAN 1993–1997	IRE 1987–1989	FIN 1994–1998	GRC 1990–1994	May-10 GRC 2010–2015	Jul-11 GRC 2010–2015
Start	−3.3	−1.1	−2.4	7.2	−5.4	−1.9	−1.6	−6.8	2.2	4.0	4.2
Finish	2.5	2.2	0.7	15.0	−0.9	−1.2	−0.7	1.6	−1.1	−3.1	−0.4
Average annual change	1.2	0.5	0.4	2.0	0.9	0.1	0.3	1.7	−0.7	−1.4	−0.9
Total change	5.8	3.3	3.1	7.8	4.4	0.7	0.9	8.5	−3.4	−7.1	−4.6

Source: IMF

The maximum levels of general government gross debt implied by the programs are additionally reported in Table A4. The maximum levels experienced by all of the countries in the previous adjustments were to be surpassed by the 2013 forecast for Greece, which at 149.2 percent of GDP would become the largest of any advanced economy since 1980—aside from Japan which has a debt market with unique characteristics.

Tables A5 and A6 document the current account changes, changes in real effective exchange rates (REERs), and exchange rate regimes during the adjustments. These indicators are of critical importance when analyzing the program of May 2010 because being in the Euro zone meant that Greece could not devalue its currency against its most important trading partners.

Table A5 shows that Greece had a current account deficit far greater than any of the other countries at the onset of its adjustment. Table A6 shows that the listed countries had varying degrees of exchange rate flexibility, from the fully floating Canadian dollar to the pegged Danish krone. These differences are mirrored in a wide variety of outcomes for the REER during the stabilization episode, with some countries experiencing overall depreciations while others appreciated. However, a closer look at the table reveals that even those countries that experienced real appreciation

TABLE A4—MAXIMUM GENERAL GOVERNMENT GROSS DEBT (*percent GDP*) IN THE LARGEST EPISODES OF FISCAL ADJUSTMENTS VERSUS GREEK PROGRAMS

	NLD 1996–2000	BEL 1984–1990	UK 1994–2000	DNK 1983–1986	SWE 1994–1998	CAN 1993–1997	IRE 1987–1989	FIN 1994–1998	GRC 1990–1994	May-10 GRC 2010–2016	Jul-11 GRC 2010–2016
Maximum	74.1	125.6	49.3	71.9	73.2	101.7	109.2	56.5	100.5	149.2	172
Year	1996	1990	1997	1984	1996	1996	1987	1994	1993	2013	2012

Source: IMF

TABLE A5—PERCENTAGE POINT CHANGE OF THE CURRENT ACCOUNT IN THE LARGEST EPISODES OF FISCAL ADJUSTMENTS VERSUS GREEK PROGRAMS

	NLD 1996–2000	BEL 1984–1990	UK 1994–2000	DNK 1983–1986	SWE 1994–1998	CAN 1993–1997	IRE 1987–1989	FIN 1994–1998	GRC 1990–1994	May-10 GRC 10-15	Jul-11 GRC 10-15
Current account balance at the start of the adjustment (percent GDP)	6.2	−0.6	−1.9	−3.9	−1.3	−3.6	−3	−1.3	−3.4	−11.2	−11
T	−1	0.5	0.9	1.7	2.4	−0.2	2.9	2.4	−0.4	2.8	0.6
T + 1	1.4	0.9	−0.3	−0.8	2.2	1.6	0.2	3	2.3	1.3	2.2
T + 2	−3.3	1.8	0.4	−2.4	0.2	1.5	−1.5	−0.1	−0.4	1.5	1.1
T + 3	0.6	−0.7	0.7	−0.6	0.6	1.3		1.6	1.2	1.6	0.8
T + 4	−1.9	0.3	−0.3		−0.3	−1.8		0	0.6	1.2	0.3
T + 5		0	−2							0.9	0.8
T + 6		−0.4	−0.3								
Cumulative	−4.3	2.4	−0.7	−2.1	5.1	2.3	1.6	6.9	3.3	9.3	5.8

Source: IMF

during the period of adjustment, had undergone significant real depreciation shortly *before* undertaking the stabilization program.[34] It may be important that the two least flexible exchange rate regimes in the sample, Denmark and The Netherlands, were the two countries that saw a significant deterioration in their current account balance. Conversely, the two countries that saw the greatest improvements to their current accounts were Sweden and Finland, who both floated their currencies having withdrawn from the ERM immediately before their adjustments.

To try to compare these examples to the position of Greece in May 2010, Figure A1 plots cumulative CPI indices for Greece and Germany since the Euro inception, using historical data up to 2010 and May 2010 forecasts for the subsequent period. A widening of the gap between the two is a (rough) proxy for REER appreciation. It is clear that by this metric Greece's REER (i) appreciated significantly during the precrisis period, and (ii) was expected to go on appreciating for several years into the adjustment period.

[34] The exception to this rule is Greece in the early 1990s. That adjustment occurred when its inflation was high (double digit throughout). Despite Greece's nominal effective exchange rate depreciating by over 30 percent during the adjustment, the REER based on CPI is likely to have appreciated.

Table A6: Summary of Real Effective Exchange Rates (REER) Based on CPI and Monetary Regimes in the Largest Episodes of Fiscal Adjustments versus Greek Program

Country	Change in REER during adjustment [1]	Exchange rate regime	Notes	Cumulative current account change (% GDP)
NLD 1996–2000	Depreciated by 12.9 percent	Pegged in ERM, fixed from 1998	The REER of the Dutch guilder remained broadly stable during the two years immediately before the fiscal adjustment.	−4.3
BEL 1984–1990	Appreciated by 7.1 percent	Pegged in ERM	The Belgian franc devalued by 8.5 percent in February 1982 against EMS currencies.	2.4
UK 1994–2000	Appreciated by 27.2 percent	Floating, abandoned peg	The UK abandoned the peg in September 1992 resulting in the REER devaluing by 15 percent from 1992:III to 1993:I.	−0.7
DNK 1983–1986	Appreciated by 9.6 percent	Pegged in ERM	The Danish krone did not devalue its peg but its REER did depreciate by 7.3 percent in the two years before the adjustment.	−2.1
SWE 1994–1998	Depreciated by 10.9 percent	Floating, abandoned peg	Sweden abandoned the peg in November 1992 resulting in the REER devaluing by 22.0 percent from 1992:III to 1993:III.	5.1
CAN 1993–1997	Depreciated by 21.5 percent	Floating	The REER of the Canadian dollar fell modestly by 2.4 percent in the two years before the adjustment started.	2.3
IRE 1987–1989	Depreciated by 3.6 percent	Pegged in ERM	The Irish pound devalued by 8 percent in August 1986 against EMS currencies but this had a muted effect on Ireland’s REER as the British pound was depreciating significantly at the time.	1.6
FIN 1994–1998	Appreciated by 10.6 percent	Floating, abandoned peg	The Finnish markka devalued by 12 percent against EMS currencies in November 1991 before abandoning the peg in September 1992 resulting in the REER devaluing by 16.7 percent from 1992:III to 1993:III.	6.9
GRC 1990–1994	Appreciated by 14.2 percent	Floating	This era of Greece’s economy is marked with high but declining inflation which peaked in 1990 at 27 percent before decreasing to 11 percent by 1994. The REER of the drachma appreciated modestly by 4.3 percent during the two years immediately before the adjustment.	3.3
May-10 GRC 2010–2015	CPI Inflation was forecast to remain relatively stable vis-à-vis German inflation (see Figure 4)	Eurozone	The REER of Greece had appreciated by 19 percentage points since joining the Euro in 2002. Figure 2 shows the divergence in competitiveness based on CPI between Greece and its main trading partner Germany in the decade before the first bailout.	9.3

Notes: [1] REER data is derived from the nominal effective exchange rate using the quarterly release of CPI data. The series are produced by the IMF and obtained via Thomson Reuters DataStream. The series have a base year 2005 = 100 and change “during adjustment” refers to the value of the series in the first quarter of the first year of the adjustment to the value of the series in the last quarter in the last year of the adjustment. Historical data of REERs based on ULCs have also been obtained and display similar changes. No forecast of Greece’s REER over the adjustment period is available from the IMF. Verification that Greece had a floating exchange rate regime (1990–1994) is needed.

The evidence from the previous fiscal adjustments contained in Tables A5 and A6 together suggests that the current account improvement forecast for Greece in May 2010 were optimistic given the fact that Greece had become uncompetitive in the decade since joining the Euro and, moreover, it was not expected to devalue its REER substantially through the adjustment.

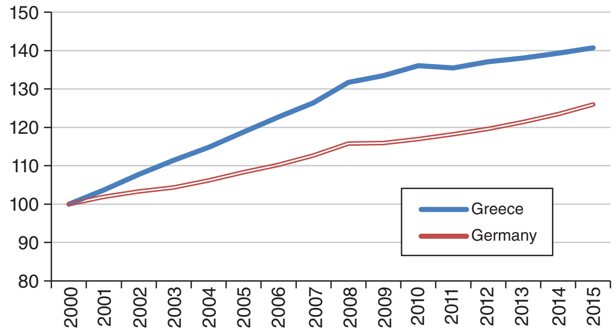

Figure A1. Realized and Forecast CPI Inflation Index 2000 = 100 (2000–2015)

Note: For 2010–2015 the figure shows IMF forecasts as of May 2010.

Sources: All German data (with the forecasts) and Greek data up to and including 2009 is from the April 2010 IMF WEO Report. Forecasts for Greek inflation 2010–2015 are from the May 2010 IMF Country Report No. 10/110.

In sum, the May 2010 agreement committed Greece to an adjustment that, while not unprecedented in its size, was unprecedented in the adversity of the macroeconomic context within which it was to be implemented.

B. *Benefits from PSI in the Form of Longer Maturities*

It is important to begin by saying that there is immense confusion regarding the details of the bond swap envisaged in the July 21 agreement. The official documents are incredibly opaque and hard to reconcile with each other; participants to the agreement gave different accounts in the subsequent press conferences; and even in the following weeks different accounts persisted in the press and in documents issued by financial-market participants. This of course underscores the chaotic nature of EU-Council decision-making, which is one of the key themes of our paper. But it is particularly important for the discussion at hand because it means that, quite frankly, nobody knows what core-country governments really thought they had exactly agreed to. With this caveat, we make two main points.

The upper bound on the extent to which the bond swap reduced financing needs up to 2014 is €54 billion. The figure comes from a press release by the Institute of International Finance (IIF) issued to coincide with the EC meeting.[35] The press release and the technical documents that accompany it do not provide any details on how the figure had been arrived at, other than to say that it is based on a "target participation rate of 90 percent." But the 90 percent participation rate was immediately greeted with considerable skepticism. Representatives of the media queried the 90 percent number as early as in the press conferences of various council participants in the immediate aftermath of the meeting. Many noted that the list of banks

[35] As mentioned in the text, confusingly the EC's post-meeting communique cites a much lower figure of EUR 37B. We return to this below.

announcing their participation missed many important players (also, some of the ones adhering to it had no Greek bonds to exchange!), and several major banks were distinctly coy about their participation in the days and weeks after July 21. Many also noted the extreme opacity and complication of the menu of options offered to would-be bond exchangers, and suggested that such opacity cast doubt on the eventual success of the swap.[36] The skeptical reaction to the IIF "Financing Offer" suggests to us that €54 billion was an unrealistic figure, and should have seemed so at the time.

Next, and equally if not more importantly, we turn to the issue of the net effect of the PSI component on official creditors' required commitments to Greece over the period 2011–2014. It is absolutely crucial to understand that, irrespective of the reduction in the value of the bonds to be amortized in the 2011–2014 period, PSI created novel financing needs that would not have otherwise occurred.[37]

One obvious cost would have been increased costs of recapitalizing Greek banks following the NPV losses on their huge holdings (relative to their size) of Greek government bonds. Such changes would substantially increase the bank recapitalization bill and, since Greece was obviously unable to cope by itself, they correspondingly increased the financing bill for creditors in the official sector.

Possibly even more importantly, in order to induce private creditors to participate in the debt swap, the operation included a "credit enhancement" program in which the new bonds issued by Greece would be guaranteed by AAA-rated bonds issued by the EFSF, i.e., the official sector. This of course represents new commitments from official creditors. There is confusion about the size of this new commitment. As mentioned, the EC's communique cites a contribution from the debt swap of €37 billion, potentially suggesting an estimated cost of credit enhancement equal to €54 billion − 37 billion = 17 billion. Subsequent to the meeting, however, the figure most often cited for the cost of credit enhancement was €35 billion. These figures suggest that credit enhancement alone reduced the net contribution of PSI by somewhere between $1/3$ and $2/3$ of the upper-bound figure mentioned in the IIF document.

To get an example of some of the calculations circulating in the days after July 21, we reproduce in Table A7 a table from Eurobank Research (Greece Macro Monitor: August 2, 2011). It shows the €54 billion of financing coming from PSI (item B4—note that they emphasize the assumption of 90 percent participation), but it also shows the increased financing need due to credit enhancement (a2) and Greek bank recapitalization (a4). Interestingly, $a2 + a4 > B4$, though we admit that not all the €20 billion in recapitalization needs can necessarily be attributed to PSI: the situation of Greek banks had deteriorated for other reasons as well.[38]

[36] To give just one instance, on July 22 Goldman Sachs' reading of the IIF proposal was that "the expected notional amount of bonds involved will be in the region of EUR 13.5B."

[37] All the points we are about to make were well-understood and widely discussed at the time. See, e.g., the July 2011 European Commission's "Fourth Review" of the Greek program (Occasional Paper 82), particularly Box 1.

[38] The table also shows another cost of the broad PSI component of the July agreement. i.e., EUR 20B to finance a debt buyback operation. The debt buyback idea was another disaster, and it disappeared from the news fairly quickly. The reason is not hard to discern: financing the buyback would have required more money from the official creditors, as is seen in the table. However the buyback is clearly distinct from the rollover, and we do not discuss it further.

Table A7—Reproduced from Eurobank Research (*Greece Macro Monitor: August 2, 2011*)

Table 1

Borrowing need and finacing sources (1) (euro billion) mid 2011 - mid 2014	
A. Borrowing need (inclusive of the cost of PSI, DBB & bank recap.)	
a1. General gvtn deficit & amortizations *MLT (non-official) and official creditors*	161,0
a2. Cost of credit enchancement	35,0
a3. Cost of DBB	20,0
a4. Cost for bank recapitalisation	20,0
Total (a1+a2+a3+a4)	236,0
B. Financing source (official sources & PSI)	
b1. Privatization receipts	28,0
b2. EU/IMF (still undisbursed from existing Greek Loan Facility)	45,0
b3. New EFSF/IMF loans	109,0
B4. PSI (90% participation)	54,0
Total (b1+b2+b3+b4)	236,0

Source: EU, IIF, Eurobank research projections
(1) The table above assumes roll over of full ammount of maturing T-bills

But bank recapitalization and credit enhancement are only two of several ways in which the debt swap—and PSI more generally—would have been likely to increase Greece's overall financing needs—and hence official creditor commitments.

Another way in which PSI almost certainly increased overall financing needs is by exacerbating Greece's inability to borrow from private creditors. Clearly Greece was struggling to persuade markets to buy its bonds for a number of reasons but, as we already argued in the text, the specter of PSI had clearly been one of these (as testified by many market participants' comments). From this perspective, the symbolic haircut contained in the July agreement is absolutely perverse. While it offers virtually no relief to Greece and its official creditors, it indicates to markets that further future haircuts are still on the table. This perpetuates Greece's exclusion from private markets and correspondingly increases its need to rely on official creditors.

Next, there are hard-to-quantify but plausibly significant adverse general-equilibrium effects of PSI on overall financing needs. In particular, to the extent that PSI worsened overall credit conditions in Greece (both by weakening Greek banks and by impairing market access for Greek companies), it also exacerbated the Greek depression, with obvious implications for the government deficit and, once again, the need for support from EU partners and IMF.

Finally, it is worth reiterating that PSI would have forced the acknowledgement of mark-to-market losses not only on Greek banks but also on banks in other European countries. In several of these countries the banking system was already in considerable stress, so it is not unlikely that some of the money allegedly saved by official creditors through the bond swap would have had to be used to support their own banks.

We acknowledge that it is very difficult to quantify the overall impact on Greece's financing needs from these adverse consequences of PSI, but we believe it to be quite sizable. Coupled with our previous point that the €54 billion of existing bonds whose maturity would be extended is almost certainly overestimated, we think that the net reduction in the burden for official creditors is modest indeed, if not negative.

Regardless, it seems inconceivable that such benefits would have outweighed the enormous potential costs (to the official creditors themselves) of dragging Italy into the crisis.

REFERENCES

Alesina, Alberto, and Silvia Ardagna. 2009. “Large Changes in Fiscal Policy: Taxes versus Spending.” *Tax Policy and the Economy,* Vol. 24, edited by Jeffery R. Brown, 35–68. Chicago: University of Chicago Press.

Alesina, Alberto, and Allan Drazen. 1991. “Why are Stabilizations Delayed?” *American Economic Review* 81 (5): 1170–88.

Ardagna, Silvia, and Francesco Caselli. 2014. “The Political Economy of the Greek Debt Crisis: A Tale of Two Bailouts: Dataset.” *American Economic Journal: Macroeconomics.* http://dx.doi.org/10.1257/mac.6.4.291.

Austen-Smith, David. 1990. “Information Transmission in Debate.” *American Journal of Political Science* 39 (1): 124–52.

Austen-Smith, David. 1993. “Information and Influence: Lobbying for Agendas and Votes.” *American Journal of Political Science* 37 (3): 799–833.

Austen-Smith, David, and Timothy Feddersen. 2005. “Deliberation and Voting Rules.” In *Social Choice and Strategic Decisions: Essays in Honor of Jeffery S. Banks*, edited by David Austen-Smith and John Duggan, 269–318. Berlin: Springer-Verlag.

Austen-Smith, David, and Timothy Feddersen. 2006. “Deliberation, Preference Uncertainty, and Voting Rules.” *American Political Science Review* 100 (2): 209–17.

Bini Smaghi, Lorenzo. 2010 “Challenges for the Euro Area, and the World Economy.” Speech, Group of Thirty, 63rd Plenary Session, Rabat, May 28. http://www.ecb.europa.eu/press/key/date/2010/html/sp100528.en.html.

Bini Smaghi, Lorenzo. 2011 “Eurozone, European Crisis and Policy Responses.” Speech, Goldman Sachs Global Macro Conference, Hong Kong, February 22. http://www.bis.org/review/r110222b.pdf.

Borensztein, Eduardo, and Ugo Panizza. 2008. “The Costs of Sovereign Default.” International Monetary Fund (IMF) Working Paper 08/238.

Buiter, Willem. 2010a. “Greek Sovereign Debt Restructuring Delayed But Not Avoided for Long.” Unpublished.

Buiter, Willem. 2010b. “Sovereign Debt Problems in Advanced Industrial Countries.” Speech, C. Peter McColough Series on International Economics, May 7, 2010. http://www.cfr.org/greece/sovereign-debt-problems-advanced-industrial-countries/p22081.

Cline, William R. 2011. “Sustainability of the Greek Public Debt.” Peterson Institute for International Economics Policy Brief 11-15.

Cottarelli, Carlo, Lorenzo Forni, Jan Gottschalk, and Paolo Mauro. 2010. “Default in Today’s Advanced Economies: Unnecessary, Undesirable, and Unlikely.” International Monetary Fund (IMF) Staff Position Note SPN/10/12.

Coughlan, Peter J. 2000. “In Defense of Unanimous Jury Verdicts: Mistrials, Communication, and Strategic Voting.” *American Political Science Review* 94 (2): 375–93.

Crawford, Vincent P., and Joel Sobel. 1982. “Strategic Information Transmission.” *Econometrica* 50 (6): 1431–51.

Cukierman, Alex, and Mariano Tommasi. 1998a. “Credibility of Policymakers and of Economic Reforms.” In *The Political Economy of Reform,* edited by Federico Struzenegger and Mariano Tommasi, 329–48. Cambridge: MIT Press.

Cukierman, Alex, and Mariano Tommasi. 1998b. “When Does It Take a Nixon to Go to China?” *American Economic Review* 88 (1): 180–97.

Drazen, Allan. 2000. *Political Economy in Macroeconomics*. Princeton: Princeton University Press.

Drazen, Allan, and Vittorio Grilli. 1993. “The Benefit of Crisis for Economic Reforms.” *American Economic Review* 83 (3): 598–607.

Eliaz, Kfir, Debraj Ray, and Ronny Razin. 2007. “Group Decision-Making in the Shadow of Disagreement.” *Journal of Economic Theory* 132 (1): 236–73.

Gerardi, Dino, and Leeat Yariv. 2007. “Deliberative Voting.” *Journal of Economic Theory* 134 (1): 317–38.

Gerardi, Dino, and Leeat Yariv. 2008. “Information Acquisition in Committees.” *Games and Economic Behavior* 62 (2): 436–59.

Hsieh, Chang-Tai. 1997. "Bargaining over Reform." Unpublished.

Kambas, Michele, and Sakari Suonimen. 2011. "Athanasios Orphanides: Interview with Reuters," http://www.bis.org/review/r110805a.pdf.

Lane, Philip R. 2012. "The European Sovereign Debt Crisis." *Journal of Economic Perspectives* 26 (3): 49–67.

Lizzeri, Alessandro, and Leeat Yariv. 2012. "Sequential Deliberation." http://www.hss.caltech.edu/~lyariv/papers/SeqDeliberation.pdf.

Meriowitz, Adam. 2006. "Designing Institutions to Aggregate Private Beliefs and Values." *Quarterly Journal of Political Science* 1 (4): 373–92.

Orphanides, Athanasios. 2011. "New Paradigms in Central Banking?" Central Bank of Cyprus Working Paper 2011-6.

Perotti, Roberto. 2011. "The 'Austerity Myth': Gain without Pain?" http://www.bis.org/events/conf110623/perotti.pdf.

Persico, Nicola. 2004. "Committee Design with Endogenous Information." *Review of Economic Studies* 71 (1): 165–91.

Ponsati, Clara, and József Sákovics. 1995. "The War of Attrition with Incomplete Information." *Mathematical Social Sciences* 29: 239–54.

Reinhart, Carmen M., and Kenneth S. Rogoff. 2011. *This Time Is Different: Eight Centuries of Financial Folly*. Princeton: Princeton University Press.

Roubini, Nouriel. 2010. "Greece's Best Option Is an Orderly Default." *Financial Times,* June 28. http://www.ft.com/cms/s/0/a3874e80-82e8-11df-8b15-00144feabdc0.html.

Zettelmeyer, Jeromin, Christoph Trebesch, and G. Mitu Gulati. 2013. "The Greek Debt Exchange: An Autopsy." http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=5343&context=faculty_scholarship.