Rethinking the European monetary union

Jens Nordvig (Lead Author)

Head of Fixed Income Research Americas &
Global Head of G10 FX Strategy
Nomura Securities

Dr. Nick Firoozye

Head, European Rates Strategy
Nomura Securities

Wolfson Economics Prize 2012 – Final submission

Substantially revised version as part of second-round submission by short-listed entrants

The opinions expressed in this paper reflect the personal viewpoints of the authors, not an official view of their employer.

Table of Contents

Introduction

The question presented

The question posed by the Wolfson Economics Prize has been defined as follows:

"If member states leave the Economic and Monetary Union, what is the best way for the economic process to be managed to provide the soundest foundation for the future of growth and prosperity of the current membership?"

In addition, six specific aspects of the broader issue have been outlined:

1. The optimum monetary reconfiguration.
2. Implications for sovereign debt, private savings, and domestic mortgages.
3. Implications for international contracts denominated in Euro.
4. The effects of the stability of the banking system.
5. Approaches to transition.
6. The institutional implications.

Each of these aspects involves complex issues in its own right, and it is not feasible to deal comprehensively with all aspects in a single paper. As a result, we focus our energies on what we feel are the most important areas, especially those areas where we believe we have something new to add to the process and policy debate.

The goal of our paper

The goal is to *provide truly practical solutions* to the problems the Eurozone is currently facing, with policy recommendations meant to maximise growth and prosperity while taking into account economic, legal and political constraints.

We seek to *move beyond a conceptual discussion* whenever possible, providing quantitative estimates of the size of the forces actually at play. Such quantification is needed to make sound policy choices to the benefit of the citizens in the Eurozone and beyond.

A number of important parameters needed to conduct a detailed applied macro analysis cannot be obtained through official statistics. To overcome this obstacle in the empirical analysis of Eurozone break-up, *we construct our own datasets,* which are presented in detail in appendices and summarised in the main text. Specifically, we create two novel data sets:

- The first data set provides a *detailed breakdown of Euro-denominated assets by legal jurisdiction*.
- The second data set provides estimates of *foreign currency external liabilities for Eurozone countries following exit from the EMU*.

The main aim of our paper is to address the challenges European policymakers are currently facing. A serious and detailed cost-benefit analysis of various forms of break-up has so far been missing from the debate, and we try to fill this gap. Our concrete approach allows us to dispel the myth that any type of break-up is necessarily devastatingly costly and should be avoided by all means. Rather, we elaborate on how to mitigate the fall-out from single country exits and other forms of limited break-up. Since any form of break-up, much like entry, involves ultimately political decisions, we attempt to address practical methods by which policymakers and other stakeholders can minimise the cost and disruption from the large undertaking of exit, redenomination, and devaluation in a way that ensures a return to growth and stability.

The structure of the paper

PART I of the paper contains three chapters dealing with *Europe's challenge and how to analyse it:*

In **Chapter 1**, we outline *the key choice ahead for Europe*, focusing on the Eurozone's fundamental choice between further integration or a break-up, whether limited or complete.

In **Chapter 2**, we proceed to discuss *why a break-up of the Eurozone has no precedent*. We show that there are essentially no comparable episodes in history, even if there have been many currency dissolutions. We emphasise the special and important issues associated with the Euro's role as an international currency.

In **Chapter 3**, we extract guiding principles for redenomination from *legal analysis*. Certain legal constraints are binding, and we set the stage for relevant applied macro analysis of heretofore obscure issues associated with break-up. We highlight that the large size of various foreign law exposures is critically important in determining key macroeconomic effects in a break-up.

PART II of the paper has four chapters focusing on *optimal reconfiguration:*

In **Chapter 4**, we define a *framework for analysing optimal reconfiguration in the current crisis setting,* to justify the purpose of exit and redenomination. We emphasise both the importance of maximising the benefits of devaluation and minimising the costs from financial losses and political fall-out.

In **Chapter 5**, we analyse negative *balance sheet effects* from external liabilities in foreign currencies following exit from the EMU (based on the guiding principles for redenomination).

In **Chapter 6,** we estimate the *spill-over effects* to remaining EMU countries from exits (based on the guiding principles for redenomination).

In **Chapter 7**, we summarise our findings in the context of *overall costs and benefits associated with various break-up scenarios*, and outline the *ex post optimal configuration*.

PART III of the paper has two chapters that address *managing the transition,* focusing on the key policy steps ahead of and immediately after a limited or full-blown break-up, with the goal of achieving the optimal reconfiguration as set out in part II:

In **Chapter 8**, we discuss *preparedness and contingency planning*, stressing the importance of adopting a risk management approach to possible break-up scenarios in minimising transition cost.

In **Chapter 9**, we turn to *managing exit and capital flight*, stressing that capital flight is a difficult problem to solve but is not a binary process, and we propose measures to reduce it.

PART IV of the paper contains two chapters with *conclusions*:

In **Chapter 10**, we summarise key policy insights and proposals from the previous chapters, by highlighting seven specific elements of our analysis.

In **Chapter 11**, we present a synthesis of how to *rethink the European monetary union.*

Beyond the main text, we provide considerable additional detail in various appendices, including background information on detailed data construction and data analysis.

Since we wanted to discuss the above mentioned issues in detail, there are other relevant areas that we do not cover, mainly due to space limitations. These include the process for dissolution of the ECB in a full-blown break-up, optimal monetary policy strategies for newly independent national central banks, the nature and legal basis for fiscal and political union for the remaining Eurozone countries, and other post-exit macro policies to ensure maximum stability and growth.

Terminology

We use the term *Eurozone* to describe the institutional construct whereby, currently 17 countries are joined together by a common monetary policy, a common currency, and other elements of coordinated economic policy. We use *EMU* interchangeably with Eurozone (i.e., we do not use EMU to refer to the signatories to the treaty which formed the basis for the introduction of the Euro).

GIIPS stands for Greece, Ireland, Italy, Portugal and Spain.

We use the term *exit* to describe individual countries departing from the Eurozone (i.e. a limited break-up).

We use the term *full-blown break-up* to describe a situation where all Eurozone countries move back to national currencies, the Euro ceases to exist and the ECB is dissolved.

We use the term *current membership* to refer to the current currency union members, as they are the parties most central to the question.

TFEU stands for the Treaty on the Functioning of the European Union.

Part I:
Europe's challenge and how to analyse it

Chapter 1:
The big choice ahead for Europe

Before we turn to the practicalities of various Eurozone break-up scenarios, it is useful to think about the basic choice Europe, and the Eurozone in particular, is currently facing. This is a historical time. European policymakers will need to make important decisions one way or another about how to deal with the challenges posed by the tensions within the EMU. It is a basic choice between increased integration or a form of break-up.

The European monetary union was never an optimal currency area in an economic sense, at least not based on standard criteria as spelled out in the literature on the subject (Bayoumi et al. 1992; Takagi et al. 2003). The process around the introduction of the Euro was designed in order to allow economic convergence to happen ahead of Euro adoption. The convergence criteria spelt out were meant to be filtering mechanisms, which only admitted countries when they were deemed suited to give up monetary independence.

In reality, however, political considerations dominated. The Maastricht criteria for economic convergence were repeatedly overruled: Italy entered the European Monetary Union and adopted the common currency at its outset despite having much higher government debt than the 60% limit spelt out in the convergence criteria. Meanwhile, Greece joined the common currency in 2001, despite having broken a number of entrance criteria, including criteria pertaining to deficit and debt levels.

Policymakers and some economists hoped that the currency union itself would be a catalyst for convergence (Frankel 1997) so that even if member countries were not suitable ex ante, they would be suitable ex post, once the common currency had been in effect for some time. That was the theory at least, although there was also plenty of academic research questioning this logic (Krugman 1993). In the end, the political dimension – the desire to see additional European integration for reasons beyond the pure economic – dominated.

Academic research pointed out the weaknesses in the institutional setup from the outset and the dangers involved from a forward-looking perspective. Most importantly, while the EMU worked with a common central bank (the ECB), it did not have a common Treasury. There was no common fiscal body that could work towards smoothing out asymmetric shocks facing member countries. This was a departure from the norm of most successful currency unions, such as the United States, Canada or Switzerland. In addition, the ECB's role as a lender of last resort was not well defined. In fact, the founding treaties explicitly prohibited the ECB from taking on such a role, as it was perceived as inflationary and undemocratic for the ECB to provide financing for individual states in a system of independent sovereign nations.

Initially, these institutional weaknesses were not particularly visible in the functioning of the EMU. The first ten years of the Euro were generally regarded as successful (Trichet 2008); Eurozone financial markets were generally well-behaved in the initial years after the launch, and the ECB managed to gradually build credibility as an inflation-focused central bank.

The global financial crisis, which hit global markets and the global economy particularly hard from 2008, tested this structure of the EMU in an unprecedented way. The initial epicentre was the US subprime market, which shocked the Eurozone through leveraged vehicles like synthetic CDOs. Eventually, however, the crisis became more Europe-centred due to sovereign debt concerns and continued banking sector instabilities. Initially, the deleveraging happened on a broad basis, across essentially all Eurozone countries. Later, a clear pattern of divergence started to become clear. In 2010, the deleveraging process continued in countries in the Eurozone periphery, while economic

performance normalised in core Eurozone countries, especially in Germany. Soon tension concentrated in Greece permeated vulnerable Eurozone countries, and bond spreads widened dramatically in a number of countries. European policymakers responded with a strategy based primarily on fiscal austerity, coupled with a number of short-term lending facilities, to fill the gap from the disappearance of market-based financing options. To tide the markets over, the ECB began its Securities Market Programme to purchase government debt.

This austerity-based strategy is now being tested at its core. In Greece, the strategy never yielded the desired results, as primary deficits and growth continued to lag set targets. The failure of the strategy necessitated a debt restructuring (partial default) in March 2012; a possibility European policymakers had fully ruled out less than two years earlier.

The policy decisions themselves have also taken a toll. In particular, the damage inflicted on investors from the Greek PSI would have been far less (and far less discriminatory) had a default happened in 2009 when market access was denied. Official sector financing has subordinated most debt holders. Moreover, the legally questionable decision to treat the ECB differently from other bond holders on its own holdings of Greek debt has made this subordination problem explicit and has potentially limited the ability of the ECB to intervene in bond markets in the future (unless it effectively guarantees solvency of the sovereign). Meanwhile, the ECB's decision to flood the market with LTRO money in late 2011 and February 2012, although it helped banks to refinance their coming redemptions via repos with the ECB, has prompted many banks to take advantage of the so-called 'carry trade' and load up on sovereign debt that was funded from the ECB. This then has inextricably linked stable banks to weak sovereigns and limited the ability of policymakers to intervene in more strategic ways.

Some would argue that special circumstances, such as those around particularly weak processes for tax collection in Greece, may have played a role in the Greek failure to achieve successful fiscal stabilisation. This type of argument is substantially weakened, however, by recent developments in countries such as Spain. Despite attempting a fairly ambitious program of expenditure cuts, revenue increases, and structural reforms, the Spanish austerity program has also run into trouble over the past year. Fiscal targets for 2011 were missed by a wide margin and deficit targets for 2012 were unilaterally adjusted higher by Spain in a departure from the agreed process. Meanwhile, the Spanish unemployment rate is skyrocketing on the back of the deepening recession (it reached a record high of 24.4% in the first quarter of 2012).

Developments in Spain have been the catalyst for a clear shift in the debate: widespread doubts about the viability of the current austerity strategy are now being expressed in the peripheral countries and elsewhere. Importantly, the recent election results in France and Greece can be viewed as signals of growing opposition to the austerity focused approach.

The escalating Eurozone crisis has exposed the flaws in the design of the European monetary union. As a result, European policymakers are now facing a historical dilemma: how to remedy the institutional setup in order to secure lasting stability and growth while maintaining the democratic legitimacy of the European project.

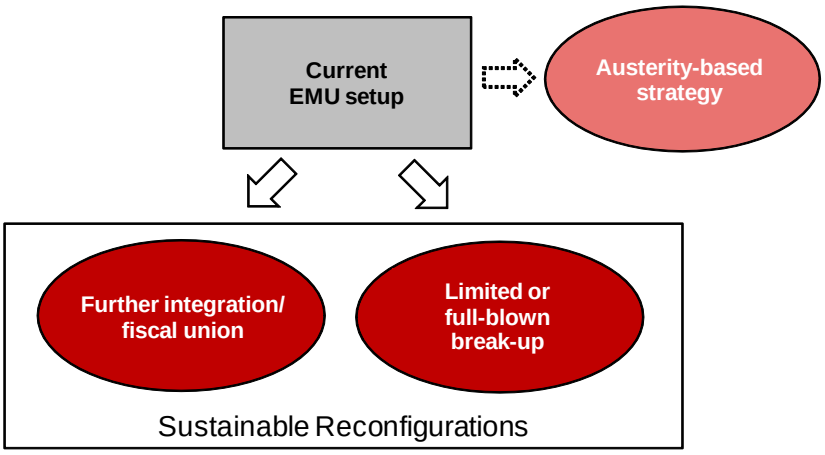
There are two fundamentally different possible remedies:

- ***Increased integration***, including elements of a fiscal union with sufficient capacity to undertake transfers large enough to counter the effects of asymmetric shocks.
- ***Disintegration in the form of break-up of the Eurozone***, allowing countries to return to independent monetary policy and to regain competitiveness through currency depreciation.

The path chosen so far by policymakers is neither toward significant additional integration (fiscal union) nor toward disintegration (break-up). Elements of moderate additional integration have been undertaken with implicit fiscal transfers allowed under strict conditionality (austerity) but with serious capacity constraints that keep these institutional arrangements from being permanent fiscal transfer mechanisms.

The current path of austerity may be approaching a dead-end. It appears to have exacerbated the challenges involved in an already painful deleveraging process in certain countries. At a minimum, the process has lost credibility that will be hard to regain, and this confidence crisis will add to the costs involved in the process overall, including significant loss of output and rising unemployment.

Figure 1.1: The big choice ahead for European policymakers:



The implication of dwindling investor confidence and increased financial market instability is that European policymakers will soon have to take a stance about the fundamental direction of the Eurozone: more or less integration? If the political backing for additional integration is not there, the only viable alternative is a form of break-up.

The possibility of any form of break-up was entirely dismissed by policymakers up until the end of 2011. While and policymakers are increasingly embracing the possibility of a Greek exit[1], a full-blown break-up remains largely a taboo topic.

In this context, it is worth stressing that it is possible to have a limited break-up, involving exits of a limited number of countries, while increasing integration within the remaining Eurozone member countries. In fact, tension around a break-up could well be a catalyst for an additional important step toward integration, including some degree of fiscal union.

Regardless, there is clearly increasing likelihood of some form of break-up, and it is time to think hard about how to manage the process in the best way possible.

[1] Following the first round of the Greek election in early May, we have even had reports that Eurozone governments are making contingency plans for a Greek exit from the Euro at the national level.

Chapter 2:
Why a Eurozone break-up has no precedent

If we look back long enough, there are plenty of examples of currency unions which have failed. The more recent examples include the break-up of the Czechoslovak currency union in 1993 and the break-up of the Rouble-zone from 1991-93[2]. In this Chapter, we outline why a break-up of the Eurozone is a truly unprecedented event. As a result, inference based on previous currency union dissolutions in history must be made with great caution.

In thinking about the issues facing the Eurozone, it is natural to try to learn from the history of previous currency union break-ups. However, upon closer inspection, there are a number of important differences between the situation the Eurozone is facing now and the situations other currency unions on the verge of break-up faced in the past. This does not mean that history cannot provide any important lessons, but it does imply that one needs to be very careful in drawing general conclusions based on economic trends that characterised previous break-ups[3].

There are three main reasons why it is difficult to use past experiences with currency union break-ups as a template for developments in the Eurozone today:

- The relative size of the Eurozone economy and its financial markets
- The degree of financial development in the Eurozone
- The Euro's role as an international currency

Below, we discuss these three aspects of the Eurozone that render its break-up irreconcilably different.

The size of the Eurozone economy and its financial markets

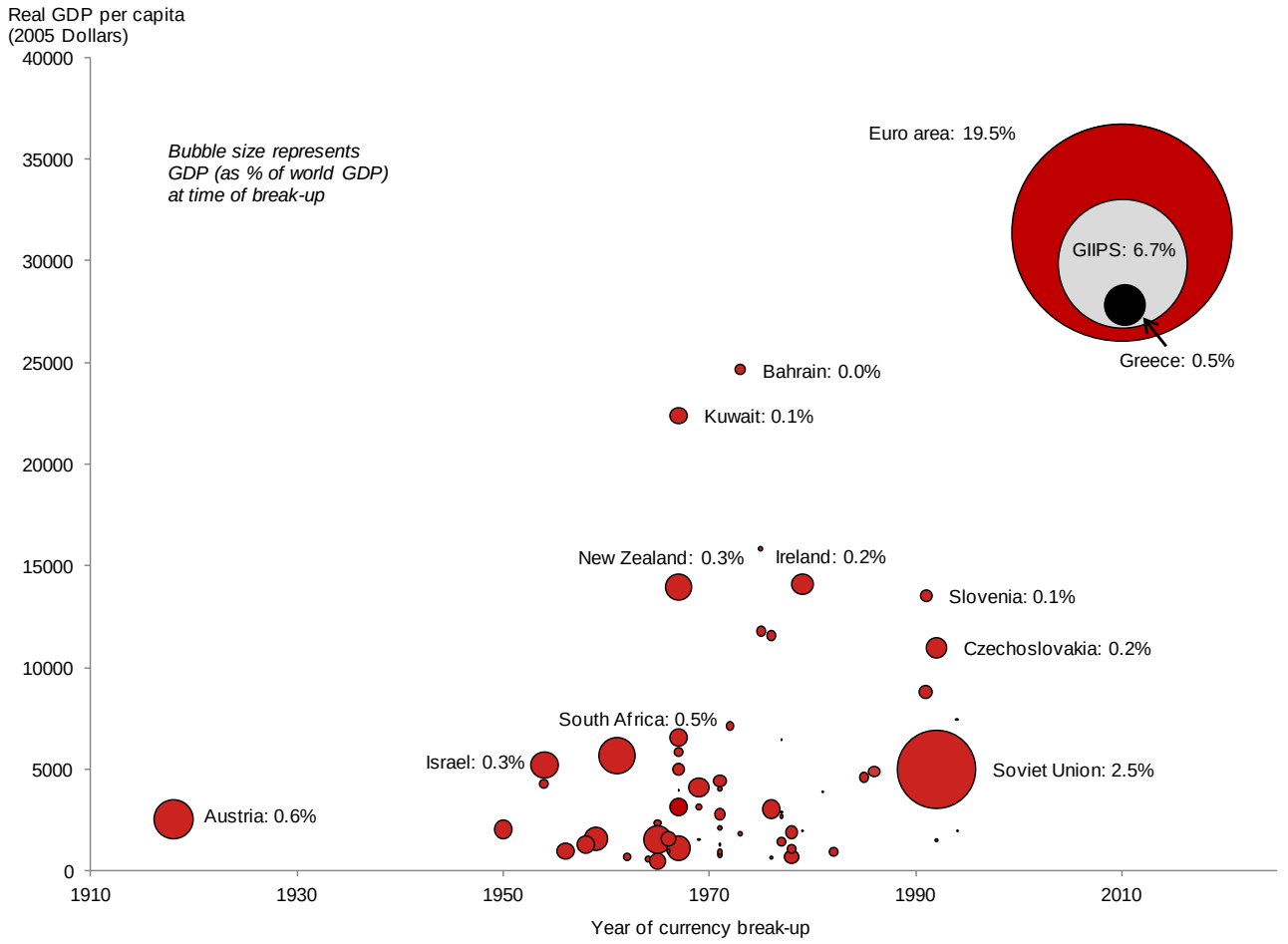
In terms of its economy and financial markets, the Eurozone plays an important role globally, especially as compared to past break-up countries. The Eurozone nations currently account for roughly 20% of global GDP (measured in current US dollars at the market exchange rate), with GIIPS countries alone accounting for 6.7% of global output.

In the chart below, we compare the size of the Eurozone economy to the economic size of past currency unions that faced break-ups, by looking at their share of world GDP at the time of break-up. Figure 2.1 clearly illustrates that the Eurozone stands out in terms of economic importance as measured by GDP (size of the bubble), accounting for an unprecedentedly large share of the global economy compared to previously disassembled currency unions.

[2] In Box 2.1, we show a list of 67 examples of currency union break-ups spanning the period from 1918 to today, along with data we have collected on the size of these economies in relation to world GDP at the time of break-up and the level of GDP per capita in real terms at the time of the break-up.

[3] The breadth of literature analysing past currency union break-ups is not large, but the key papers include Bordo et al. (1999), Bordo (2010), Nitsch (2004) and Rose (2007). The problem with applying these historical studies to the question at hand, however, is that past currency union break-ups typically involve countries which had a fundamentally smaller impact on global markets and economies than would the Eurozone today. In general, most past examples involve very small countries, with limited financial development. This means that any direct comparison with Eurozone countries will be somewhat inaccurate.

Figure 2.1: Timing, size and level of development in past currency union break-ups



Note: Size of bubbles reflects GDP as a share (%) of world GDP at the time of break-up. GDP per capita at the time of break-up is measured in 2005 Dollars, and we have included a full-blown Eurozone break-up, a limited break-up involving only GIIPS countries, and a unilateral Greek exit in 2012 for illustrative purposes. Due to data restrictions, Austria is the only country included from the Austro-Hungarian break-up.

Source: Authors' calculations, Penn World Tables, World Bank, Peterson Institute for International Economics, CIA World Factbook

Around the time when the Soviet Union was disintegrating and the Rouble-zone broke down, the Soviet region accounted for only 2.5% of global GDP. This is the largest share of world GDP in our list of previous currency union break-ups, but is just 1/3 of the size of the current GIIPS country economies relative to current world GDP. Economic output, however, is only one metric of the importance of the Eurozone in the global economy. If we look at the size of Eurozone financial markets, we will find that the relative importance of the Eurozone is even greater. For example, Eurozone banks account for 35% of global bank assets and for 34% of global cross-border lending[4]. Conversely, the Soviet Union was not very integrated in the global financial system at the time of its currency union break-up. This helps to explain why there were limited global implications from that currency separation process, but it also highlights that the situation in the Eurozone today is very different, considering the size of the economies and their importance in financial markets from a global perspective. The table below further illustrates that economic and financial market disturbances in the Eurozone have important global implications, which have generally not carried nearly the same weight in past currency union break-ups.

[4] One could perhaps argue that this figure is partially distorted by cross-border lending within the Eurozone itself.

Figure 2.2: Financial and economic positions of previous currency union break-ups

	Previous 67 currency union break-ups (averages)	GIIPS	Eurozone
Share of world:			
GDP	0.1%	6.7%	19.5%
Debt market	-	8.6%	19.8%
Equity market	-	2.4%	9.6%
Banking system			
Assets	-	6.6%	35.0%
Cross-border positions	-	8.2%	33.9%
GDP per capita (2005 prices)	5885	29946	31392

Note: World measure of debt market adopted from McKinsey survey based on data from Dealogic, BIS, SIFMA, S&P, and McKinsey proprietary analytics.

Source: Authors' calculations, World Bank, Bloomberg, BIS, The Penn World Tables, Peterson Institute for International Economics, CIA World Factbook

The degree of financial development in the Eurozone

The large size of Eurozone financial markets is not only a function of the economic girth of the region; it is as much a function of the very high degree of financial development in the region[5]. It is hard to compare the degree of financial development in the Eurozone with that of regions which experienced currency union break-ups in the past. One simple and available proxy we can use is a measure of GDP per capita in inflation-adjusted terms. The y-axis in Figure 1 displays real GDP per capita for the currency unions in our sample. It is clear that the Eurozone stands out in this metric (as it did in its size). To be specific, the real GDP per capita in the Eurozone is about 5 times as high as the average observed in previous examples of currency union break-ups in our sample. Since leverage is generally a rising function of income, the difference in financial leverage between the Eurozone today and past experiences of currency union break-up is likely to be even more pronounced than the real GDP per capita proxy would suggest.

Moreover, there are going to be significant differences between a break-up of the Eurozone and past currency union break-ups in relation to capital mobility[6]. In turn, new circumstances govern the risk of capital flight in this break-up scenario; staggeringly more mobile capital would create transition costs exponentially higher than those in historical examples.

The Euro's role as an international currency

Finally, we want to stress that the Euro's role as an important international currency raises new issues associated with a break-up that have not been in play in earlier periods of currency union break-up. There are many facets to the Euro's international role—it accounts for 25% of global foreign currency reserves, it is widely used in global debt capital markets (including outside the jurisdiction of the Eurozone countries), and finally there are tens of trillions of Euro-denominated derivatives contracts which are subject to English and New York law.

The relevance of the Euro's international role is especially clear in the case of a full-blown break-up, where the Euro ceases to exist. In such a scenario, there would be no precedent for how to redenominate tens of trillions of international law contracts into new currencies. In the absence of a

[5] Indeed, financial development was an explicit ex ante goal. One of the arguments for creating the Eurozone was that it would see an integration of financial markets, leading to improved liquidity and efficiency.
[6] This is partly due to advances in technology, which have made cross-border movement of capital extremely easy. The regulatory environment is also important, since capital movement is unrestricted within the Eurozone (as stipulated in the founding treaties).

carefully considered plan for dealing with the unprecedented redenomination issues, this scenario could freeze the global financial system and create very large legal and economic transition costs.

The international aspect of the Euro also raises issues in a limited break-up scenario in which the Euro lives on in some form. To address these issues, we examine the widespread international use of the Euro through two lenses:

The Euro's global share in:

- **International currency reserves:** Recent COFER data from the IMF suggests that 25% of global reserves are denominated in Euros.
- **Official sector deposits:** 19% of global central bank deposits are Euro-denominated, according to the BIS.
- **Cross-border loans:** The BIS also reports that 34% of all cross-border bank loans are denominated in Euros, although this figure includes intra-Eurozone cross border activity.
- **Global FX market turnover:** 39% of FX market turnover involves the Euro, according to the BIS's tri-annual survey.

The foreign law share of Euro denominated instruments:

- **Sovereign bond issuance in the Eurozone:** 7% of sovereign bonds issued in the Eurozone are issued under foreign law, according to our calculations described in Appendix II.
- **Non-sovereign bond issuance in the Eurozone:** A more substantial 30% of non-sovereign bonds are issued under foreign law, according to our calculations described in Appendix II.
- **Euro denominated derivative contracts:** The foreign law share of Euro denominated derivatives amounts to around 95%, according to informal sampling done by the authors.

From either perspective, the Euro is inextricably intertwined with global markets. The Euro is a principal reserve and trading currency and a significant portion of securities issuance in Euro is completed under foreign law. This issue is not unique to the Eurozone. For example, it has been common for decades for emerging countries to issue bonds under foreign law. However, the size of this issue in the Eurozone has no homolog. As we outline in detail in Chapter 5, the magnitude of foreign law external liabilities for Eurozone countries exceeds – by a wide margin – what has been the norm in other countries in the past. This means that balance sheet effects associated with redenomination and currency depreciation are potentially of magnitudes larger than we have seen in past currency separation examples, with important implications for growth.

What we can and cannot learn from history

In addition to the specific issues quantified above, there are at least two broader differences. First, a disorderly break-up process could make it difficult to continue to cooperate at the EU level, and could lead to a reversal of decades of trade integration. Such an unwinding of achievements of the EU is likely to be highly destructive to European economic performance, and is a consideration which cannot be appreciated by looking at historical examples of currency union dissolutions.

Second, there is also the broader issue of the unprecedented level of indebtedness in developed market countries, including the Eurozone countries. This creates new challenges that need to be incorporated into the analysis and for which history offers no good 'event studies'.

These differences do not mean that an understanding of historical experiences is not helpful. Many of the underlying fundamental economic issues are the same, even if key parameters are different in the context of the Eurozone. In addition, there may be specific lessons which remain applicable for the Eurozone, such as those relating to the logistics around the introduction of new notes, for example.

But one must be cautious when applying the experience around past currency union break-ups. There are a number of reasons why a break-up of the Eurozone entails entirely different and more complex issues than post currency union break-ups, and could create much more severe damage to the economies of member states, if not managed efficiently and thoughtfully.

In the following chapters, we will zero in on a number of these special issues, including the prevalent use of the Euro in international contracts, the outsized balance sheet effects associated with Eurozone break-up, the potential cost associated with breakdown in political cooperation, and special challenges with regard to transition.

Box 2.1: Historical currency union dissolutions

This currency union break-up list contains 67 countries that experienced an exit from a currency union (1918- present), based on a list constructed by Andrew K. Rose in his study entitled Checking Out: Exits from Currency Unions (2007). In addition to the countries in his list, we also consider the Austro-Hungarian break-up of 1918 and the Rouble-zone break-up of 1992. Eurozone aggregate figures include all 17 countries currently using the Euro as their currency.

Country	Year of break-up	GDP (% of world GDP)	Real GDP per capita (2005 Dollars)	Country	Year of break-up	GDP (% of world GDP)	Real GDP per capita (2005 Dollars)
Algeria	1969	0.2%	4092	Macedonia	1992	0.0%	6266
Angola	1976	0.1%	3009	Madagascar	1982	0.0%	914
Austria	1918	0.6%	2555	Malawi	1971	0.0%	778
Bahrain	1973	0.0%	24642	Mali	1962	0.0%	708
Bangladesh	1965	0.3%	1541	Malta	1971	0.0%	4015
Barbados	1975	0.0%	15866	Mauritania	1973	0.0%	1807
Bosnia and Herzegovina	1992	0.0%	1521	Mauritius	1967	0.0%	5112
Botswana	1977	0.0%	2695	Morocco	1959	0.2%	1572
Burundi	1964	0.0%	597	Mozambique	1977	0.0%	1438
Cape Verde	1977	0.0%	2900	New Zealand	1967	0.3%	13962
Comoros	1994	0.0%	1979	Nigeria	1967	0.2%	1108
Croatia	1991	0.1%	8810	Oman	1975	0.0%	11771
Cuba	1950	0.1%	2046	Rwanda	1966	0.0%	953
Cyprus	1972	0.0%	7142	Sao Tome and Principe	1977	0.0%	6473
Czechoslovakia	1992	0.2%	10980	Seychelles	1967	0.0%	3972
Dominican Republic	1985	0.0%	4574	Sierra Leone	1965	0.0%	2366
Equatorial Guinea	1969	0.0%	1549	Singapore	1967	0.1%	4974
Eurozone	**N/A**	**19.5%**	**31392**	Slovenia	1991	0.1%	13533
Gambia	1971	0.0%	1303	Solomon Islands	1979	0.0%	1963
Ghana	1965	0.1%	507	Somalia	1971	0.0%	934
GIIPS	**N/A**	**6.7%**	**29946**	South Africa	1961	0.5%	5699
Guatemala	1986	0.0%	4874	Soviet Union	1992	2.5%	5004
Guinea	1969	0.0%	3169	Sri Lanka	1966	0.1%	1570
Guinea-Bissau	1976	0.0%	666	Sudan	1956	0.1%	976
Guyana	1971	0.0%	2121	Suriname	1994	0.0%	7435
Iraq	1967	0.1%	3164	Tanzania	1978	0.1%	675
Ireland	1979	0.2%	14091	Tonga	1991	0.0%	5631
Israel	1954	0.3%	5207	Trinidad & Tobago	1976	0.0%	11565
Jamaica	1954	0.0%	4257	Tunisia	1958	0.1%	1291
Jordan	1967	0.0%	5833	Uganda	1978	0.0%	1072
Kenya	1978	0.1%	1905	Vanuatu	1981	0.0%	3872
Kuwait	1967	0.1%	22409	Zambia	1971	0.1%	2801
Libya	1967	0.1%	6545	Zimbabwe	1971	0.1%	4426

Note: Statistics represent values at time of break-up. See Chapter 2, Footnote 1 for more detail on data compilation.

Source: Authors' calculations, Rose (2007), Penn World Tables, World Bank, Peterson Institute for International Economics

Chapter 3:
Guiding principles for redenomination: Legal aspects

While monetary unions have come and gone, it is clear that none were as closely legally and financially intertwined as the Eurozone. In addition, the Euro has become a major means of settlement for international contracts. This adds significant complexity to the redenomination process. Just which Euros stay Euros and which will be redenominated? Or even more puzzlingly, what should happen if the Euro ceases to exist? Solving the redenomination puzzle starts with looking at the legal underpinnings of the Euro and the universe of obligations and assets on various balance sheets. Extracting the guiding principles for redenomination, based on legal analysis, is a necessary first step in quantifying key parameters for macroeconomic analysis of break-up.

Key legal parameters in the redenomination process

There are a number of legal parameters which will have a strong influence on the process of redenominating financial instruments, including bonds, loans and deposits.

The **first legal parameter** to consider is the *legal jurisdiction of an obligation*.

During the introduction of the EUR, it was common to have currency clauses in contracts which explicitly tied the contract to a governing jurisdiction. A standard form for this clause would be "*Payment is to be made in EUR or the currency of <sovereign> from time to time under <country> jurisdiction"*. These clauses are far less frequent now, and it is common instead to state that the currency must be EUR without tying it to one specific jurisdiction.

Nonetheless, we can establish:

- If the obligation is governed by the *local law* of the country which is exiting the Eurozone, then that sovereign state is likely to be able to convert the currency of the obligation from EUR to the new local currency (through a new currency law).
- If the obligation is governed by *foreign law*, then the country which is exiting the Eurozone cannot by its statute change a foreign law[7].

The **second legal parameter** to consider is the *method* for break-up. Is the method a legal or a multilateral framework, or is it done illegally and unilaterally? The method of break-up has different consequences in terms of international recognition. Specifically, it may be important to distinguish between *lawful and consensual withdrawal* versus *unlawful and unilateral withdrawal*

The **third legal parameter** to consider is the *nature of the break-up*, and what it means for the existence of the Euro as a functioning currency going forward. There are many possible permutations, but they can be grouped into two main categories:

- *Limited break-up: Exit of one or more (likely smaller) Eurozone countries*. In this scenario, the Euro will likely remain in existence.
- *Full-blown break-up*: In this scenario, the Euro would cease to exist, the ECB would be dissolved, and all existing Eurozone countries would convert to new national currencies or form new currency unions with new currencies and new central banks.

[7] If there is no currency clause explicitly tying payment to the law of any one country, then it may be up to the courts to determine the implicit nexus of contract. This is an example of one of many special considerations, as discussed in detail in Appendix I.

This leaves a matrix of scenarios to consider, depending on legal jurisdiction, method of break-up and nature of break-up.

Figure 3.1: Redenomination risk on Eurozone assets

Securities/ Loans/ Obligations	Limited Break-up Scenario: Euro remains currency of core Eurozone countries		Full-blown Break-up Scenario: Euro ceases to exist
	Unilateral withdrawal	Multilaterally agreed exit	
Governed by International Law	**No redenomination: Euro remains currency of payment** (except in case of insolvency where local court may decide awards).	**Mostly no redenomination: Euro remains currency of payment but certain EUR contracts could be redenominated using Lex Monetae principle** (except in case of insolvency where local court may decide awards).	**Redenomination into:** *– Local currencies by applying Lex Monetae principle* *– ECU-2, if directive* *– Hard currency (USD, GBP, etc.) at court determined exchange rate if no legislative or EU directive*
Governed by Local Law	***Redenomination into new local currency*** *(through change in local currency law, unless not in the interest of specific sovereign)*		

For obligations issued under *local law*, it is almost certain that redenomination into new local currency would happen, through a new currency law. This is the case regardless of the method and nature of the break-up (unilateral, multilaterally agreed, and full blown break-up scenario). For example, Italian bonds, issued under local Italian law, are highly likely to be redenominated into a new Italian currency if Italy exits the Eurozone.

For obligations issued under *foreign law*, the situation around redenomination is more complex. We will go into more detail in Appendix I. But it is helpful initially to highlight the big picture:

Limited Eurozone break-up:

- **Unilateral withdrawal** and no multilaterally agreed framework for exit: foreign law contracts are highly likely to remain denominated in Euros. For example, Greek Eurobonds issued under UK law should remain denominated in Euros.
- **Exit is multilaterally agreed**: there may be certain foreign law contracts and obligations which could be redenominated into new local currency using the *Lex Monetae* principle, if the specific contracts in question have a very clear link to the exiting country. However, the large majority of contracts and obligations are likely to stay denominated in Euros.

Full blown Eurozone break-up:

In a scenario where the Eurozone breaks up in its entirety and the EUR ceases to exist, contracts cannot for practical purposes continue to be settled in Euros. In this case, there are three basic solutions.

1. **Nexus to one country:** Obligations are redenominated into new national currencies by application of the Lex Monetae principle. There is also significant rationale for the legal basis of the argument of Impracticability or Commercial Impossibility. The more common

concept of Frustration of Contract is unlikely to apply (Proctor 2010), since payment is always possible.

When no specific nexus is established to a country which previously used the EUR, (and thus the Lex Monetae principle cannot be used), the following measures could be taken:

2. **No specific nexus- Legislative:** An EU directive could be implemented ensuring that existing EUR obligations are converted into a new European Currency Unit (ECU-2), reversing the process observed for ECU-denominated obligations when the Euro came into existence in January 1999. This directive would be applied in EU courts (e.g., UK courts).
3. **No specific nexus- Judicial:** Failing legislative guidance, Euro obligations could be settled in the (hard) currency of the contract, such as GBP or USD, as per terms implicit in English and NY Law contracts, with exchange rates as determined by directive by legislation or by Courts. As we detail in Appendix I, there is even case law providing precedent for such a solution.

The practical importance of foreign law financial instruments

As we show in detail in Appendix II, Euro denominated exposure in foreign law contracts is very large. The main buckets of foreign law Euro denominated instruments can be broken down as follows:

- **Bonds**: Around EUR2 trillion foreign law bonds, including government, financial and non-financial bonds.
- **Loans**: Around EUR3.8 trillion in foreign law cross-border Euro-loans globally.
- **Currency derivatives**: Around EUR15-25 trillion (predominantly foreign law) in notional amounts outstanding.
- **Interest rate derivates**: Around EUR150 trillion (predominantly foreign law) in notional amount outstanding.

In relation to a full-blown break-up, where the Euro ceases to exist, the size of derivatives exposures governed by foreign law could be particularly important. In relation to limited break-up scenarios (individual country exits), the legal jurisdiction of assets and liabilities such as bonds, loans and deposits will be important in determining *balance sheet effects* associated with currency movements of new national currencies versus the (remaining) Euro around a Eurozone exit.

Applying legal logic to macro-analysis of a break-up

The key message of this chapter is that certain legal and contractual aspects of the redenomination process will be of crucial importance in determining macro-economic outcomes and in guiding policy in order to lessen the impact of an exit or break-up.

Contracts inside the jurisdiction of Eurozone member countries can be changed, as we have seen lately in Greece, where laws governing sovereign bonds were changed to insert collective action clauses in Greek law bonds just before the Greek debt restructuring. On the other hand, foreign law contracts and laws governing such contracts cannot easily be changed. For example, Eurozone governments have little ability to influence English law and almost no ability to influence New York law, both of which matter greatly in the context of global financial contacts. This means that the legal constraints embedded in foreign law financial instruments tend to be binding.

This general framework will apply in connection with individual countries' exit from the Eurozone. Exiting countries will only be able to change domestic legislation, such as domestic currency laws, and thereby redenominate domestic law contracts. Foreign law contracts, on the other hand, will remain largely unaffected and stay in Euros.

In connection with a full-blown break-up, the situation is more complex. Still, it may be feasible to use EU directives to change laws pertaining to the entire EU, including English law. But that is only the case if European leaders can agree. In the absence of EU-wide agreement, it will only be possible to change laws and interpret contracts differently domestically.

As previously stated, the binding legal constraints associated with foreign law contracts matter greatly for macro analysis. As we will outline in the following sections:

- Legal and contractual parameters, particularly the proportion of foreign law liabilities, will determine the size of balance sheet effects in exiting countries with important implications for output dynamics.
- Legal and contractual parameters, especially exposure to local law assets in exiting countries, will determine the magnitude of spill-over effects from exits from the Eurozone through currency losses for banks and other creditors.

In the table below, we show a stylised breakdown of cross border positions grouped according to major assets classes. We highlight in particular the difference between foreign and local law instruments.

Figure 3.2: Classification of a Eurozone sovereign's cross-border positions by legal jurisdiction

External Assets	External Liabilities	
FDI	FDI	
Portfolio equity securities	Portfolio equity securities	
Portfolio debt securities	Portfolio debt securities	Portfolio debt securities
Mortgage instruments/ covered bonds	Mortgage instruments/ covered bonds	
Other assets, cross-border bank loans	Other liabilities, cross-border bank loans	
Other assets, cross border deposits	Other liabilities, cross border deposits	
Derivatives	Derivatives	
Central bank assets	Central bank liabilities	

(foreign law)
(local law)

Liabilities noted as local law are subject to redenomination in the case of exit from the Eurozone, whereas foreign law assets and liabilities are likely to stay denominated in Euros.

Note: There are minor exceptions to the general classification outlined in the table. For example, a small proportion of Euro-denominated derivatives is traded under local law and could be redenominated. Moreover, external assets in the form of debt securities could, in special cases, be local law. These issues including exceptions to the general guiding principles for redenomination are discussed in detail in Appendix I. Central bank assets and liabilities would include TARGET2 balances, as well as traditional foreign currency reserves.

The table highlights the following basic points about a given country's external assets and liabilities:

The full range of external assets from FDI assets to central bank assets will generally fall under the jurisdiction of foreign law, with some rare exceptions. It is the liability side that is more interesting, since they consist of a mix of local and foreign law instruments.

Liabilities in the form of FDI, portfolio equity securities, mortgages, and deposits, tend to always be governed by local law (from the perspective of residency of the issuer). For example, a US foreign direct investment in Spain, a Spanish liability according to cross-border positions, will be governed by the local laws of Spain; and a Spanish cross-border deposit in a Dutch bank, a Spanish asset according to cross-border positions, will be governed by Dutch law.

Liabilities in the form of debt securities can be either local or foreign law, depending on the specific bond documentation (as discussed in detail in Appendix I). For example, a German investment in an Italian government bond, will be under the jurisdiction of the specific bond in question, local (if an Italian law bond / BTP) and foreign (if English, or other non-Italian law bond).

Liabilities in the form of cross-border loans (loans from a foreign bank), central bank liabilities, and liabilities in derivative form, tends to be governed by foreign law (from the perspective of the residency of the borrower) including international treaty law (for central bank liabilities). For example, a loan by a Japanese bank to a French corporation, a French liability according to cross-border positions, will be foreign law (likely either Japanese or English law), and a liability in the form of an currency forward agreement between an Italian corporate and a US bank would often by governed by New York law.

This may seem like a minor technical detail of interest mainly to lawyers and other specialists. As it turns out, however, the *legal aspects which guide the redenomination process are crucial for a number of macroeconomic effects* that will play a key role in economic performance following break-up and redenomination.

Part II:
Optimal reconfiguration

Chapter 4:
Framework for reconfiguration in the current crisis setting

To determine optimal reconfiguration in the current crisis setting, we focus on a framework which emphasises the importance of maximising benefits from devaluation and minimising the spill-over effects from financial losses and political risk. This approach allows us to analyse optimal reconfiguration while taking into account the key constraints imposed by the crisis and existing institutional set-up.

The debate about optimal monetary policy in Europe has often taken place in the context of whether the Eurozone is an optimal currency area (OCA). This discussion and the academic research in the area have typically focused on the variability of output around a (fixed) long-term trend. However, the OCA literature does not address the reconfiguration issue in the current crisis setting.

The key concern today is an escalating crisis, with severe negative implications for output, including real risk of depression dynamics in some countries. Importantly, the crisis has reached a dimension where it may impact longer-term growth in certain countries through sovereign debt default risk, banking sector tensions, political instability and even institutional break-down. In addition, the crisis has triggered notable reform efforts in some countries, rendering past parameters in the OCA literature obsolete in many cases.

The current challenge for policymakers is not to minimise traditional swings in output around an underlying trend; rather, it is to avoid a downward economic spiral—a bad equilibrium path—with elevated risk of continued banking sector tensions, political crisis and depressed long-term growth prospects.

Against this background, we will discuss the issue of optimal reconfiguration of the Eurozone in the context of the parameters which we believe are most important to growth in coming years. These are the parameters that matter most for overall macroeconomic outcomes in the current crisis setting. Consequently, we will not adopt a traditional OCA framework when discussion reconfiguration. Such a framework might have been appropriate ex ante (before the Eurozone was initiated), and it is arguably regrettable that the key results of this literature were ignored when the Eurozone was launched. But it is not a suitable framework ex post, given the special macro-dynamics in a crisis environment and given the large potential adjustment costs associated with dismantling the current structure.

Instead, we adopt a framework focused on maximising positive growth effects from reconfiguration, while minimising negative growth effects. We highlight five specific effects that are crucial in the current setting, taking into account both economic and political constraints involved.

These are not the only effects at play, but they are likely to be among the most important ones. Moreover, focusing on these specific effects allows us to quantify the specific effects, country by country, in the following chapters and accompanying appendices. The five effects can be grouped into two country-specific effects and three Eurozone-wide spill-over effects:

Country-specific effects:

1. **The effect of currency depreciation on output through trade:** *An intermediate goal of optimal reconfiguration should be to allow significantly overvalued exchange rates to adjust, and to permit independent monetary policies to be tailored to boost growth.* The immediate benefit would be to avoid debt deflation, weak output, and deteriorating debt dynamics. This approach would help achieve a more favourable growth path with support from greater financial stability and reduced default risk.

2. **The effect from currency depreciation through balance sheet effects.** *An intermediate goal of optimal reconfiguration should be to reduce negative balance sheet effects associated with currency depreciations*. Given large (implicit) foreign currency external liabilities across Eurozone countries, there is risk of a large negative impulse on output through the balance sheet effect. An optimal plan for break-up would seek to reduce these negative balance sheet effects through market mechanisms (risk sharing/hedging) and through official sector financing initiatives, as well as debt relief, where needed.

Eurozone-wide spill-over effects:

3. **The effect on bank losses from currency depreciation and increased defaults associated with exits***. An intermediate goal of optimal reconfiguration should be to control spill-over effects, to remaining Eurozone countries in order to secure financial stability regionally and globally*. Financial losses linked to break-up dynamics could be significant for banking systems outside the exiting country. A key consideration in the planning process should be to control and manage the fallout, to ensure orderly conditions in financial markets, and to avoid excessive deleveraging and contagion within the financial system.

4. **The effect on sovereign finance from defaults linked to exits.** *An intermediate goal of optimal reconfiguration should be to manage spill-over effects from exits on sovereign finances in remaining Eurozone member countries in order to maintain debt sustainability and financial stability for the region.* Controlling spill-over effects associated with official sector losses, on official sector loans and on the ECB balance sheet, should be a key component of ensuring overall financial stability.

5. **The potential effect on growth from break-down in political cooperation.** *An intermediate goal of optimal reconfiguration should be to avoid political instability and break-down in European cooperation*. A break-up process could happen as a function of 'political accidents' and could involve hard default on obligations to the official sector. An optimal plan for break-up would seek to avoid instances of political instability at the country level and institutional levels—events could have a negative growth impact through declining trade and financial market integration.

In the following two chapters, we focus mainly on the balance sheet effect and the two spill-over effect dimensions for the 11 main Eurozone countries in our sample (points 2, 3, and 4 above). We discuss the issue of pinpointing currency misalignment in Appendix III, and the potential costs associated with break-down in European cooperation in Appendix VI.

In Chapter 7, we try to synthesise feasible reconfigurations, taking into account the constraints imposed by the current crisis as well as the significant potential costs associated with breaking down current structures. We note that the optimal configuration ex post (after the crisis and with EMU structures already in place) is not necessarily the same as the optimal configuration ex ante (pre-crisis and before setting up the Eurozone). In this context, we also note that the costs associated with transition will be important in determining optimal reconfiguration. We will deal with minimising transition costs in detail in Part III, which focuses on key aspects of managing the transition.

Chapter 5:
Balance sheet effects for exiting countries

In Appendix III, we have analysed which Eurozone countries could potentially benefit the most from currency depreciation through trade effects. The conclusion is that the GIIPS countries and Belgium and France stand to benefit the most. Still, it is important to realise that the effect from currency depreciation on trade is only one effect. In this chapter, we focus on the negative effect currency depreciation may have on exiting countries through balance sheet effects.

Implicit in the debate about a Eurozone break-up is the notion that currency depreciation would garner positive output effects for countries leaving the Eurozone. The assumption is that a more competitive exchange rate would cause a boost to exports and facilitate import substitution, and this would see growth supported by overall improved trade performance, possibly with a lag through the J-curve effect.

This is only one of the relevant effects from currency depreciation, however. The recent literature on financial accelerators and balance sheet effects has shown that there are other important considerations at play in connection with currency depreciation. These balance sheet effects are derived from the fact that countries with external liabilities in foreign currencies are going to experience deteriorating net worth and cash flows as a function of currency depreciation, with negative implications for credit availability and investment (as explained in more detail in Appendix IV).

Measuring balance sheet effects

Balance sheet effects associated with currency moves have the potential to be a significant drag on growth, but this channel is not well appreciated in the context of Eurozone countries because they currently borrow predominantly in their own currency. In a break-up scenario, however, *exiting Eurozone countries would be exposed to foreign currency risk on foreign law liabilities.*

Crucially, such negative balance sheet effects are likely to be large in Eurozone economies given the high degree of financial development, and given large latent foreign currency exposure in the form of foreign law external liabilities. In a break-up, foreign law liabilities would stay denominated in Euros and they would constitute foreign currency liabilities for the exiting country, which can only redenominate local law instruments into a new currency.

In Appendix IV, we explain in detail the methods we have used to construct a new data set of relevant external liabilities.

Figure 5.1: Defining relevant external liabilities in a redenomination scenario

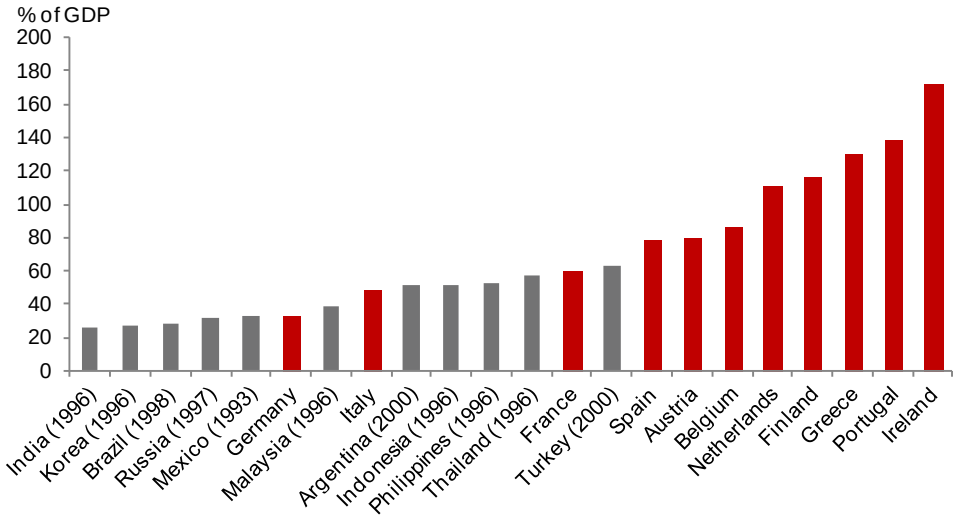
Note: Relevant external liabilities in the context of Eurozone break-up are the liabilities which will constitute foreign currency external debt ex post break-up.

The data construction essentially involves breaking down total external liabilities into local law liabilities (which can be redenominated) and foreign law liabilities (which will stay in Euros in a limited break-up scenario). The relevant component of external liabilities in relation to estimating balance sheet effects is the part governed by foreign law, which will constitute foreign currency liabilities following exit from the EMU. We note that although the analysis of strains on the country balance sheets can be an input into a default decision, we conduct our calculations assuming no default. Instead, we will address the possibility of default in Chapter 6.

The chart below illustrates the importance of this issue by comparing relevant external liabilities for Eurozone countries with the historical level of foreign currency debt in selected emerging market countries ahead of large currency moves.

Figure 5.2 simply displays headline figures of gross relevant liabilities at the country level for Eurozone countries[8]. It shows that Eurozone countries tend to have high relevant exposures. In this chart, Ireland has the largest exposure at 172% of GDP, followed by Portugal and Greece at 139% and 130%, respectively. Overall, most Eurozone countries have very significant relevant external liabilities, averaging more than two times the average for emerging markets in the past. The average exposure for Eurozone countries is 102% of GDP, compared to an average of 41% for the EM countries in our sample.

Figure 5.2: Balance sheet effects: Foreign currency liabilities in EM countries and the Eurozone



Note: The Eurozone figures are based on the relevant external liabilities calculations in Appendix IV, which measure foreign currency liabilities following an exit from the Eurozone.

Source: Authors' calculations, Lane (2007)

Output effects from balance sheet effects

It is generally accepted in the literature that negative balance sheet effects (Frankel 2004; Towbin et al. 2011) played a large role in negative output developments following large depreciations in a number of emerging market countries, such as the Asian countries following the Asian crisis in 1997-1998. Since the output effect associated with the negative balance sheet effect from large foreign currency external liabilities has potential to dominate the positive trade effect from currency

[8] We choose to focus only on the 11 largest Eurozone economies because the main economic imbalances exist within this group of countries, and because data limitations make it difficult to collect the necessary data for some of the smaller Eurozone countries.

depreciation, this aspect matters greatly in the context of growth considerations in break-up scenarios.

We are not aware of any research which quantifies the impact of the balance sheet effect on output in the context of Eurozone countries following a redenomination process. An important goal of ours is to fill this gap in the literature. Our approach is to use our own metrics of relevant external liabilities and compare them to output effects as estimated in the emerging markets literature.

One way to measure the size of the balance sheet effect is to pinpoint a level of foreign currency external liabilities for which the negative balance sheet effect fully negates the positive trade effect. A threshold level of around 30% of GDP has been estimated for emerging markets (Céspedes 2005). Foreign currency liabilities above this level imply a negative balance sheet effect that dominates the positive trade effect.

Obviously, these are only rules of thumb, but they help to illustrate that the liability exposures in place in the Eurozone could easily lead to very large balance sheet effects. When examining potential break-ups, we consider the GIIPS countries plus Belgium and France to be the most likely countries to exit the Eurozone, in part because they are the countries which have overvalued exchange rates currently (see Appendix III). Importantly, each of these countries shows a level of external liabilities well above the 30% threshold, with Italy and France being the lowest at 49% and 59% of GDP, respectively; Spain (78%) and Belgium (86%). Interestingly, the three countries with the largest relevant external liabilities in the Eurozone are Greece, Portugal, and Ireland; all with relevant external liabilities in excess of 100% of GDP.

To illustrate more specifically for Greece, Portugal and Ireland, we can use regression estimates from the literature to map the foreign currency external liabilities into an output effect. Applying the estimated coefficients in Céspedes (2005), we find a very large negative output effect amounting to 7-9% for Ireland, Portugal and Greece[9]. This is the estimated drag on output that would ensue, assuming no debt relief or restructuring around the exit.

Balance sheet effects at the sector level

Up to this point, we have looked at relevant external liabilities for the countries as a whole. From a practical stand-point, however, it is likely to be important in which sectors and specific entities these exposures are concentrated. For example, if exposures are concentrated in the corporate sector, they may be hard to offset through official sector financial support.

Figure 5.3: Sector breakdown of gross relevant external liabilities

(% of GDP)	Austria	Belgium	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Portugal	Spain
Public position	20%	17%	11%	11%	8%	109%	100%	16%	2%	66%	23%
Central bank	11%	14%	1%	8%	2%	49%	77%	12%	0%	36%	16%
General government	9%	3%	10%	4%	6%	61%	23%	3%	2%	30%	6%
Private position	59%	69%	105%	48%	25%	20%	72%	33%	108%	73%	56%
Bank	44%	50%	84%	36%	19%	16%	24%	21%	87%	48%	34%
Non-bank	16%	19%	21%	11%	6%	4%	49%	12%	21%	25%	22%
Total relevant external liabilities	**80%**	**86%**	**116%**	**59%**	**33%**	**130%**	**172%**	**49%**	**110%**	**139%**	**78%**

Source: Authors' calculations, National central banks, World Bank, BIS

The table above breaks gross relevant external liabilities into its key sector components. A few numbers stand out:

[9] Specifically, we apply the estimated coefficient on the interaction term (the product of FX depreciation and size of foreign currency external liabilities) to our specific parameters for Eurozone countries, i.e. the product of estimated FX depreciation (as outlined in Appendix III) and the relevant external liability positions.

- In terms of public sector relevant external liabilities, the program countries (Greece, Ireland and Portugal) all have very large relevant public external debt, in the region of 65%-110% of GDP. This stems from a mix of official sector loans (the General Government line item) and ECB funding to NCBs (the Central Bank line item).
- In terms of private sector exposure, the Netherlands, Ireland, Portugal and Finland show the largest exposures (all above 70% of GDP). For Ireland and the Netherlands, this is partially a function of issuance by multinationals in those jurisdictions as a function of tax issues, and for Finland, this is a function mainly of bank debt.
- For corporates (the main component of non-banks on the liability side), Ireland, Portugal and Spain have the highest relevant exposures, at 49%, 25%, and 22% of GDP, respectively, pointing to large negative balance sheet effects in an exit scenario if left unaddressed by policy steps.

Box 5.1: Balance Sheet Effects for Households

In the main text we have looked at balance sheets at the national level, focusing on external liabilities in the form of foreign law assets that would stay denominated in Euros in a limited break-up. How do households fit into the picture?

Household balance sheets in Europe are typically dominated by housing wealth and deposits on the asset side and mortgages on the liability side. Clearly a house itself is a physical asset (similar to gold) and there will be no redenomination issue. Other main items on household balance sheets should also be relatively easy to redenominate through a new currency law, as they are governed by local laws. This holds for deposits and for mortgages (as outlined in Chapter 3), except in situations where mortgages are explicitly in foreign currency (which is rare in the Eurozone, although some CHF-denominated mortgages have been issued).

In an exit scenario, households will see all main items on their balance sheet redenominated into the new national currency, and there would most likely be no direct currency effects. (In the extreme case, similar to Argentina, where different exchange rates were used for redenomination of assets and liabilities, there could be some currency effect, but we regard this possibility as remote.) Hence, balance sheet issues are generally much less important for households than for corporations and banks, which use foreign law instruments in funding operations.

There would be indirect effects on household wealth, however. First, currency depreciation would reduce the real values of incomes and assets. This unavoidable consequence of the need for macroeconomic rebalancing will involve a loss of purchasing power for the majority of citizens, although those involved in export industries are likely to benefit over time. Second, there could be losses for depositors in extreme cases of disorderly sovereign defaults, bank failure, and insufficient deposit insurance coverage.

Net relevant external liabilities

A final point pertains to whether there are any offsets on the asset side of external balance sheets. For example, a country such as the Netherlands, which has large relevant external liabilities, is likely to have more offset on the asset side of balance sheets than Greece and Portugal. However, it is unlikely to be useful to rely solely on a simple concept of net external liabilities. The current absence of a risk-transfer mechanism (see the component on hedging in Chapter 9) means that relevant assets at the country level will not provide full offset to relevant liabilities at the sector level.

One concrete example of this is the large majority of relevant external liabilities in the private sector sitting on corporate and bank balance sheets, while the relevant foreign assets are in the form of securities holdings of asset management companies (pension funds, etc.). These asset positions

will provide little direct offset for the borrowers in the corporate and banking sectors, except in the case where public pension fund money is used for macro political purposes. For this reason, the idea of net relevant external liabilities is not always an accurate concept, as it is mainly the gross exposures at sector and agent levels which will impact credit availability and output effects.

One can argue that we need a concept between gross relevant and net relevant liabilities. We have experimented with various approaches to produce the table below, which shows a measure of adjusted net relevant external liabilities with a 50% weight on positions on the asset side to capture the notion that external assets may not completely offset losses from external liabilities in a break-up scenario. There is potential for additional fine tuning of these measures, but at a minimum, the adjusted net relevant external position allows for cross-country comparison, even if the specific value may not be that meaningful in a country-specific sense.

Figure 5.4: Adjusted net relevant external position using a partial weighting of assets (% of GDP)

(% of GDP)	Austria	Belgium	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Portugal	Spain
Net relevant external position	**-2%**	**34%**	**-34%**	**13%**	**42%**	**-92%**	**-73%**	**-20%**	**8%**	**-80%**	**-50%**
Private position	9%	49%	-48%	21%	33%	13%	20%	-8%	-4%	-22%	-31%
Assets	68%	118%	57%	68%	58%	34%	92%	25%	103%	51%	25%
Liabilities	59%	69%	105%	48%	25%	20%	72%	33%	108%	73%	56%
Public position	-10%	-15%	13%	-8%	9%	-106%	-93%	-12%	12%	-57%	-19%
Assets	10%	2%	24%	4%	17%	4%	6%	4%	15%	8%	4%
Liabilities	20%	17%	11%	11%	8%	109%	100%	16%	2%	66%	23%

Note: Negative figures denote an overall net external liability position, while positive figures denote a net external asset position.
Source: Authors' calculations, National central banks, World Bank, BIS

The overall impression from this final analysis is that Germany, Belgium, France and the Netherlands will be the most resilient in the aftermath of a break-up, while GIIPS will suffer the largest losses to their balance sheets. Italy, however, shows more moderate potential losses than the other periphery countries, in part because it does not rely on funding in the form of cross-border bank loans, and in part because the majority of public sector debt is under local law (93%). This is broadly in line with the conclusions drawn when examining balance sheet effects at the sector level: the program countries (Greece, Ireland, and Portugal) continue to see the greatest damage in the case of a break-up, while Germany proves to be the most protected in terms of its balance sheet exposure.

Conclusion and implications

Our analysis demonstrates that there are very large implicit foreign currency external liabilities looming for key exit candidates. For Greece and Ireland, the bulk of these exposures are parked on public sector balance sheets. It follows that it will be almost impossible to imagine exit and currency depreciation for these countries without restructuring of public sector liabilities (both government and central bank liabilities). For example, in a situation with a 50-60% depreciation of a new Greek currency (in line with our estimates in Appendix III), and foreign currency external liabilities of 92% of GDP currently, relevant external debt would explode to around 200% of GDP.

For Portugal and Spain, both the private and public latent foreign currency exposures are significant, and have potential to generate sizeable negative output effects in a depreciation scenario. This implies that exit and currency depreciation for these countries are unlikely to achieve significant positive output effects, unless combined with both private and public sector debt restructuring and special financing facilities.

On the other hand, the large Eurozone countries, such as France and Italy, have much smaller latent foreign currency exposure, due to their reliance on local law sovereign debt issuance and lower cross-border (foreign law) bank financing of their private sectors. Hence, in an exit scenario involving depreciation of their currencies, the negative balance sheet effect may be significantly smaller (although spill-overs to other countries, as discussed in the next section, consequently would be more material). This points to the controversial conclusion that exit and currency depreciation (not counting spill-over and transitions cost) could potentially have more positive output effects in those countries.

In Chapter 9, we highlight that risk management and hedging may allow for a reduction in relevant external exposures in the run-up to an exit. This is an ex ante type of solution[10]. In addition, there may be merit in setting up vehicles for trade finance and special corporate finance vehicles to reduce the output impact from balance sheet effects. Such vehicles may mimic elements of the Commercial Paper Funding Facility (CPFF), which was used to secure financing for major corporations in the US in 2008-2009, and it may have elements of agreed debt roll-overs by international banks (a technique used in the 1998 Korean crisis). Finally, the EIB could serve an important role in providing bridge financing in such situations.

While exit decisions may not take into account the cold calculus of cost-benefit analysis, policymakers in Eurozone countries have a democratic obligation to consider the macroeconomic damage from balance sheet effects when evaluating a potential exit, and this may even impact communication with voters.

[10] We note that private hedging markets for intra-EMU currency risk are likely to start trading OTC in June/July 2012.

Chapter 6:
Spill-over effects to the rest of the Eurozone

In Chapter 5 and Appendix III, we discussed country specific macro effects associated with exit and depreciation. We now turn to spill-over effects from exits to remaining EMU countries. Importantly, a holistic cost-benefit analysis will focus on not only country specific effects, but also the broader effects through regional financial stability and sovereign debt stability. Given the strong financial linkages, these financial spill-over effects have potential to be large.

Against this background, it is useful to quantify possible spill-over effects from various break-up scenarios. We focus on *spill-over effects associated with financial losses related to defaults and FX losses, for banks and for the official sector*. Other losses for insurance companies[11], assets managers, and even central banks can also have important implications. They should matter more through longer-term wealth effects than through their impact on short-term financial stability, however. For this reason, we will focus on bank losses and losses in the official sector. In Chapter 9, we will go into some detail on another aspect of contagion, namely how to manage capital flight.

Calculating bank losses from Eurozone exits

There are two main types of cross-border losses that banks would be facing in relation to a Eurozone break-up:

- First, there are losses *linked to currency depreciation* of the potential new national currencies of exiting Eurozone member countries.
- Second, there are *losses linked to increased defaults on assets* in exiting Eurozone member countries, irrespective of whether assets stay in Euros, or get redenominated into new currency.

There have been many previous attempts to calculate possible losses for banks in various break-up scenarios (Dor 2012). Such macro level calculations of potential bank losses are typically based on BIS data, which provide aggregate figures for cross-border bank exposures at the country level. As we will show below, however, there are a number of problems germane to using this raw data, and we will highlight the key caveats below as we calculate more realistic loss estimates.

Bank losses from FX depreciation in exiting countries

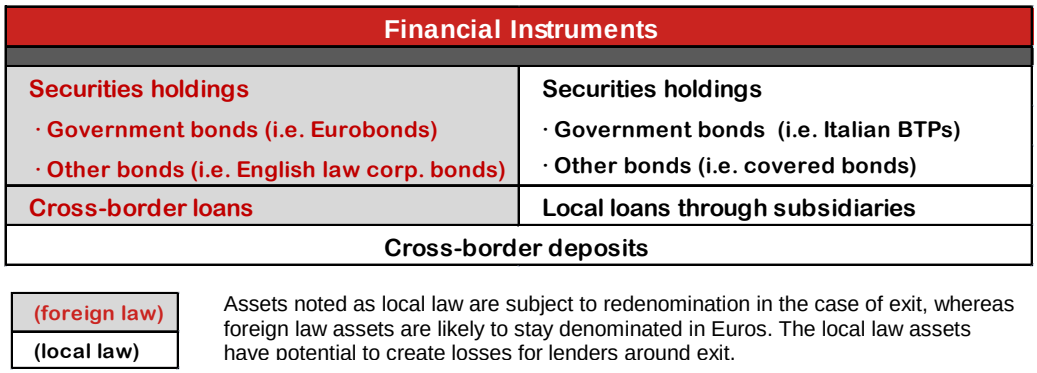
The first caveat to keep in mind when calculating bank losses is that it is not correct to assume that all cross-border bank assets in a given country involve currency risk for parent banks in a break-up and currency redenomination scenario. For example, a cross-border loan from a German bank to a Spanish corporate would typically be done under English law, and the contract would not be easy to redenominate in a break-up scenario. That is, not all Eurozone bank assets relating to exiting countries would be subject to currency risk.

In fact, our guiding principles for redenomination imply that only the local law cross-border bank assets are subject to currency risk for the creditor banks. For this reason, any realistic calculation of potential currency losses would have to take into account the portion of cross-border bank assets which are under local jurisdiction.

[11] Given tensions around the near-failure of AIG in the US in 2008, this could be a major concern. However, AIG was a special case in that AIG was involved in many markets playing different roles, such as a broker/dealer rather than an insurer. Hence, we do not focus on a similar possibility in the context of the Eurozone.

The diagram below illustrates which components of cross-border bank assets are relevant for this type of calculation.

Figure 6.1: Cross-border bank assets subject to redenomination risk



To address the distinction, our calculation below takes into account that only local law assets will be directly impacted by FX losses. Our calculation relies on our own dataset for the breakdown of Euro-denominated assets by legal jurisdiction and on our estimate of the deposit share of cross-border bank assets (Appendix II and Appendix V).

Figure 6.2: FX-related bank losses in exit scenarios (EUR bn)

Banking system in:	Losses relating to exit in: Greece	Portugal	Ireland	Spain	Italy	GIIPS	Belgium	France	Total Losses
Austria	0.1	0.1	0.1	0.3	1.3	**1.9**	0.1	0.7	**2.6**
Belgium	0.0	0.5	0.2	1.2	2.1	**3.9**		8.1	**12.0**
Finland	0.0	0.0	0.0	0.1	0.0	**0.1**	0.0	0.2	**0.3**
France	0.4	1.5	1.5	7.0	18.4	**28.7**	15.2		**43.9**
Germany	1.3	2.6	1.0	9.1	15.4	**29.4**	3.5	7.4	**40.4**
Greece		0.0	0.0	0.0	0.0	**0.1**	0.0	0.1	**0.2**
Ireland	0.0	0.0		0.3	0.1	**0.5**	0.0	0.4	**0.9**
Italy	0.1	0.1	0.1	1.8		**2.2**	0.1	0.7	**2.9**
Netherlands	0.1	0.3	0.8	0.0	2.1	**3.3**	7.0	4.0	**14.3**
Portugal	0.0		0.1	1.3	0.3	**1.6**	0.0	0.4	**2.0**
Spain	0.0	1.8	0.1		1.9	**3.8**	0.6	1.9	**6.3**
Total	**2.1**	**6.9**	**3.9**	**21.0**	**41.6**	**75.5**	**26.6**	**23.7**	**125.8**

Note: Assumes a 30% depreciation of exiting country.

Source: BIS

The high level take-away is that losses linked to currency moves are smaller when one takes into account issues associated with legal jurisdiction than when one assumes that all cross-border assets are exposed to the currency risk associated with redenomination (see Figure 6.2). Note that we used a generic depreciation assumption for illustrative purposes, but that these figures could also be generated with country-specific depreciation estimates (as shown in Appendix III).

Bank losses from defaults in exiting countries

The *second* caveat to take into account in relation to calculating bank losses pertains to the fact that a significant portion of cross-border bank exposure in the Eurozone is accounted for by local subsidiaries or majority-owned foreign banking businesses. For example, French banks own some

of the largest Italian and Greek banks. Since the local banks operate as individual corporations, what is really at stake for parent banks in France, Germany, and elsewhere is the equity exposure involved (including the implicit equity in the form of intercompany loans).

In cooperation with Nomura bank equity analysts (Nordvig, 2012(a)), we have looked into the specific magnitude of loan exposure through local subsidiaries on a company by company basis for selected banks. Having done this analysis in detail, we realised that for a number of key institutions, the equity at stake in local subsidiaries will serve as an important upper bound on losses. The implication of this finding is that aggregate losses, taking into account this limit, will be substantially smaller than when losses are estimated from haircuts on total asset exposure as reported by the BIS.

Thus, we decided to gauge the aggregate size of *country specific equity exposure* relative to total asset exposure at the country level. This result from this exercise is that equity exposures relative to total ultimate risk assets typically range from 10-20%.

Since this creates an upper bound on losses (although reputational issues could trigger additional equity injections in some cases), this is an important consideration. In our preferred loss calculation, we apply a 15% loss of asset values to represent bank losses in the case of default in another Eurozone country (see Figure 6.3 below and detailed calculations in Appendix V).

Figure 6.3: Bank losses resulting from a loss of equity (EUR bn)

Banking system in:	Losses relating to exit in:								Total Losses
	Greece	Portugal	Ireland	Spain	Italy	**GIIPS**	Belgium	France	
Austria	0.3	0.1	0.2	0.5	2.1	**3.3**	0.2	1.1	**4.6**
Belgium	0.1	0.3	2.5	1.5	1.4	**5.9**		6.8	**12.6**
Finland	0.0	0.0	0.1	0.1	0.1	**0.3**	0.0	0.4	**0.7**
France	5.1	2.5	3.2	13.3	38.4	**62.5**	25.9		**88.4**
Germany	1.5	3.5	11.0	16.9	15.5	**48.4**	3.2	20.2	**71.9**
Greece		0.0	0.1	0.0	0.1	**0.1**	0.0	0.2	**0.4**
Ireland	0.0	0.1		0.6	0.2	**0.8**	0.1	0.6	**1.5**
Italy	0.3	0.4	1.8	3.2		**5.6**	0.4	5.0	**11.0**
Netherlands	0.4	0.6	1.5	0.0	4.0	**6.5**	13.2	7.5	**27.2**
Portugal	0.9		0.5	2.7	0.3	**4.4**	0.0	0.8	**5.2**
Spain	0.1	8.8	0.9		3.6	**13.4**	0.6	3.2	**17.2**
Total	8.8	16.3	21.8	38.8	65.6	**151.2**	43.7	45.8	**240.7**

Note: Table shows approximate upper bound on losses from default derived from estimated equity to asset ratios.

Source: BIS

Comparing figure 6.3 with figure 6.2 previously, the bank losses related to default (through loss of equity) are more substantial than losses resulting from currency depreciation even after taking into account the effect from the upper bound. For example, we calculate that France and Germany could experience substantial losses from the exit of GIIPS countries of EUR63bn and EUR48bn.

Total losses for banks: Macro implications

At the macro level, the numbers look relatively manageable. The charts above and below illustrate the losses associated with a sequential exit process, starting with Greece and progressing to Portugal, Ireland, Spain, and Italy. They are based on the same assumptions, i.e. a 30% currency move, and losses which wipe out the entire cross-border equity position of banks. They shows that the losses associated with exit and loss of equity positions in Greece, Portugal and Ireland combined are not going to significantly exceed 1% of GDP in any country's banking system.

Figure 6.4: Total bank losses in a GIIPS exit scenario (% of GDP)

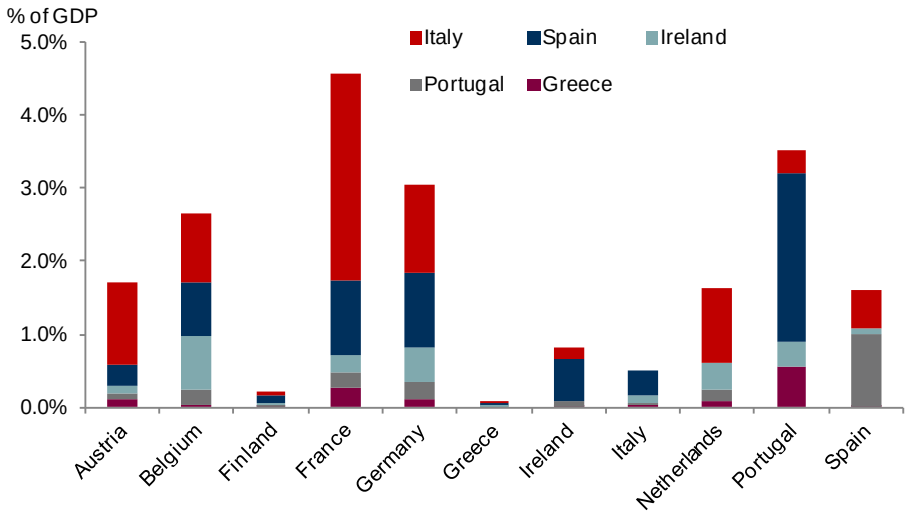
Banking system in:	Losses relating to exit in: Greece	Portugal	Ireland	Spain	Italy	GIIPS	Belgium	France	Total Losses
Austria	0.1%	0.1%	0.1%	0.3%	1.1%	**1.7%**	0.1%	0.6%	**2.4%**
Belgium	0.0%	0.2%	0.7%	0.7%	0.9%	**2.7%**		4.0%	**6.7%**
Finland	0.0%	0.0%	0.0%	0.1%	0.0%	**0.2%**	0.0%	0.3%	**0.5%**
France	0.3%	0.2%	0.2%	1.0%	2.8%	**4.6%**	2.1%		**6.6%**
Germany	0.1%	0.2%	0.5%	1.0%	1.2%	**3.0%**	0.3%	1.1%	**4.4%**
Greece		0.0%	0.0%	0.0%	0.0%	**0.1%**	0.0%	0.2%	**0.3%**
Ireland	0.0%	0.1%		0.6%	0.2%	**0.8%**	0.1%	0.6%	**1.5%**
Italy	0.0%	0.0%	0.1%	0.3%		**0.5%**	0.0%	0.4%	**0.9%**
Netherlands	0.1%	0.1%	0.4%	0.0%	1.0%	**1.6%**	3.4%	1.9%	**6.9%**
Portugal	0.6%		0.4%	2.3%	0.3%	**3.5%**	0.0%	0.7%	**4.2%**
Spain	0.0%	1.0%	0.1%		0.5%	**1.6%**	0.1%	0.5%	**2.2%**

Note: Losses calculated as % of GDP. For example, losses for French banks are scaled in relation to French GDP.

Source: BIS

The losses are clearly more significant if we add currency losses and loss of equity associated with a Spanish exit, and even more significant if we add Italy into the sequence of exits. Nevertheless, even in that scenario, the largest hit, on the French banking system, is less than 5% of French GDP. This is clearly not an immaterial number, and it may indeed necessitate meaningful capital injections, including from the French government. A more detailed analysis would take into account the amount of capital currently available in the banking system, but since there is currently a strong focus on increasing capital ratios it may not be easy to use this type of buffer in a fashion that would preserve financial stability. In any case, we will look at the loss figures as a rough proxy for capitalisation needs. Even so, it is hard to argue that the size of this specific loss is the factor which is fundamentally going to alter French sovereign debt dynamics.

Figure 6.5: Total bank losses in a GIIPS exit scenario (% of GDP)



Note: Losses calculated as % of GDP. For example, losses for French banks are scaled in relation to French GDP.

Source: BIS

This result is a function of various factors. First, banks have already reduced intra-Eurozone exposure dramatically. Since 2006, aggregate intra-Eurozone cross-border exposures are down by 48% (see Appendix II for details). Second, banks have tried to avoid exposure to local law assets (such as local deposits) given the rising break-up risk (Tett 2012). Third, banks have tried to reduce equity exposure to local subsidiaries. For example, many banks have used the LTRO this year to obtain financing directly at the local subsidiary level, and reduce funding from parent entities, given the risk of outsized losses in specific countries in exit scenarios.

The flip side of the reduced bank exposure and the lower potential losses for banks, however, is that official exposures have grown significantly, as we detail below. In addition, this also creates a risk for depositors in peripheral countries if both the foreign parent company and the local deposit insurance fail to provide a backstop.

Calculating official sector losses from Eurozone exits

Official sector exposure within the Eurozone is generally subject to English law. For example, the documentation underlying EFSF loans is explicitly written with reference to English law. This means that there is no currency risk involved (at least not directly) for official sector creditors. This provides only limited protection for sovereign creditors, however, since the real issue is one of debt sustainability, as we have seen in Greece.

The starting point for any loss calculation is to quantify the relevant exposures. In relation to official sector exposure there are four main components:

1. Bilateral official sector loans (to Greece)
2. EFSF loans (to Greece, Ireland, and Portugal)
3. ECB holdings of peripheral bonds (Greek, Irish, Portuguese, Spanish, and Italian bonds)
4. Liabilities of national Eurozone central banks to the ECB[12] (mainly relevant for Greece, Ireland, Portugal, Spain and Italy)

Figure 6.6: Official sector exposures to GIIPS, Belgium, and France (EUR bn)

(EUR bn)	Greece	Portugal	Ireland	Spain	Italy	GIIPS	Belgium	France	Total
Bilateral loans	53	0	0	0	0	**53**	0	0	**53**
EFSF loans	108	10	12	0	0	**130**	0	0	**130**
SMP bond exposure	49	33	33	49	49	**212**	0	0	**212**
TARGET2	107	75	120	276	274	**853**	51	99	**1004**
Total	**317**	**117**	**165**	**325**	**323**	**1248**	**51**	**99**	**1399**

Note: Bilateral loans are based on Q4 data for Greece (Nordvig 2012(c)). TARGET2 balances are derived from international investment position data and are measured as net figures of central bank assets and liabilities in the form of "other" investments. EFSF loans data is taken directly from EFSF website (as of 21 May). SMP bond exposures are based on aggregate data provided by the ECB and our estimates of the country breakdown.

Source: Authors' calculations, EFSF, ECB, National central banks

In the appendix, we add up these exposures. We also conduct a simple loss calculation, where we distribute losses on EFSF loans in accordance with EFSF contribution weights. The more controversial part of the loss calculation is the part which pertains to central banks exposures, as it

[12] Mainly TARGET2 balances, with a smaller component for those liabilities derived from 'overprinting' of physical notes.

can be argued that ECB losses can be absorbed in reserves and paid in capital as well as neutralised by future seigniorage[13].

For the purpose of our calculation, we look at official sector exposures in totality, including all four components. That is, we do not differentiate between government and central bank exposure. Detailed loss calculations can be found in Appendix V.

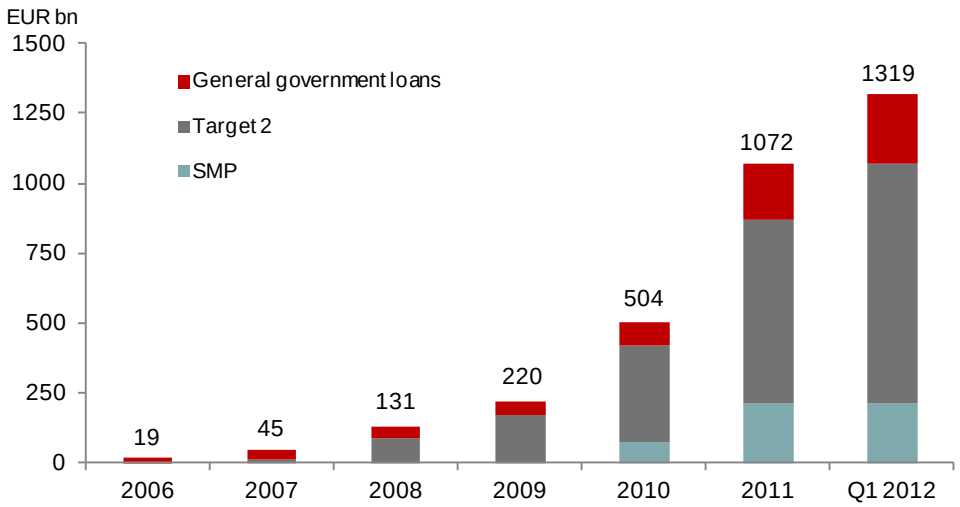
It is evident from this simple summation that the exposures have become very large. As a percent of Eurozone GDP, these exposures now stand at around 13-15%, depending on whether one includes France and Belgium. Importantly, as opposed to the banks, the losses associated with these assets are not limited to any equity proportion; hence, maximum loss is theoretically 100%.

If we add some proportion of these losses to public debt ratios on a country by country basis, it would lead to significant jumps in some countries, especially if added on top of bank recapitalisation needs. However, this is not entirely precise, first because EFSF and bilateral loans are already accounted for in standard gross debt statistics, and second because the ECB may be able to absorb some of the losses without translating into a fresh funding need for governments, at least not immediately, as mentioned earlier. Hence, it is difficult to do a calculation where one simply adds potential losses on these exposures to current debt to GDP ratios.

Projecting future official sector exposure

Even if the building exposure will not directly add to funding needs, the build-up is concerning from the perspective of the implicit transfer component. In this context, it is interesting to consider more than just a static calculation. It is worth looking at how these official sector exposures have grown over time, given how quickly the situation is evolving. The chart below illustrates developments over the last five years, focusing on GIIPS exposures (but full details are in Appendix V).

Figure 6.7: Breakdown of total official sector exposure to GIIPS (EUR bn)



Note: 2012 data taken from March 2012. All other figures derived from end of year data.

Source: National central banks

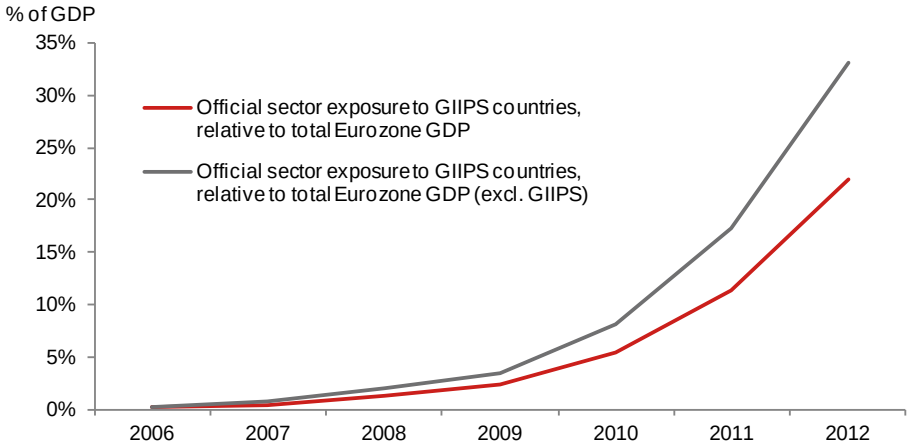
[13] One could reasonably argue that the ECB could operate with negative capital, much as the Bundesbank did after the break-up of Bretton Woods (Buiter 2008; Dalton 2005). We will not go into detail here on this topic. We merely recognise that losses at the central bank level have somewhat different solvency implications than losses on other balance sheets.

At the end of 2011, total official exposures (adding bilateral loans, EFSF loans, SMP holdings, and TARGET2 balances) amounted to EUR937bn or around 10% of total Eurozone GDP.

In this context, we also note how the official sector exposure is starting to grow at a rising rate. In Q1 alone, official sector exposure to GIIPS grew by EUR 247bn, or EUR 987bn annualised, compared to an increase of EUR 568bn in 2011, and EUR 284bn in 2010. At the current pace of increase, the exposure would be at EUR 2060bn by end-2012, or 21.9% of Eurozone GDP.

Given that we have observed dramatically increased tension in Q2, there is no reason to think that the accumulation of official exposure has decreased in the second quarter. In fact, it may well have accelerated further. Moreover, if we take into account that these exposures are ultimately backed by the core Eurozone countries, although technically backed by the Eurozone in its entirety, the numbers get even bigger. If we calculate exposure to GIIPS as a proportion on non-GIIPS Eurozone GDP, the exposure is set to jump to 33% of their GDP by the end of 2012.

Figure 6.8: Official sector exposure to GIIPS countries relative to Eurozone GDP



Note: 2012 figures extrapolated forward to end-2012 based on momentum in Q1 data.
Source: National central banks, IMF

Conclusion

Private sectors have already reduced their exposure to peripheral countries significantly. This is a key part of the reason why loss calculations for banks, in various exit scenarios, have been decreasing over time. This is a function of already-materialised financial disintegration within the Eurozone. From this perspective, an exit looks increasingly manageable, especially if banks are supported through various initiatives, as discussed in detail in Part III.

The flip side of the reduced private sector exposure is that the official sector has accumulated very large exposures. Moreover, the pace of accumulation is accelerating. Based on trends in Q1 2012, core Eurozone official exposure to GIIPS could increase to more than 30% of core Eurozone GDP by end-2012. Exposure is increasingly being accumulated through ECB TARGET2 balances. It is unclear how to think about this exposure in relation to government debt dynamics. It depends on the way the ECB decides to account for losses, and the degree to which losses are translated into recapitalisation demands and new funding needs for treasuries and debt management agencies.

The special accounting issues associated with losses on central bank balance sheets do not change the fact that central bank write-off losses amount to implicit permanent transfers. Ironically, the fact that these build-ups are happening mainly outside politically-approved channels may add to political risk over time. Such risks include fracturing within the ECB as well a revolt in countries such as Germany and the Netherlands against additional bailouts.

Chapter 7:
Ex post optimal reconfiguration scenarios

In the previous chapters in Part II and the accompanying appendices, we have discussed key aspects of optimal reconfiguration of the Eurozone, focusing on important aspects of this issue in the current crisis setting. Here, we draw conclusions about optimal configurations by pulling together the results from the previous chapters.

As mentioned in Chapter 4, we have not used a traditional optimal currency area framework in our analysis, but instead focused on specific effects important to securing economic recovery and avoiding crisis escalation.

At the individual country level, we have focused on two effects: the positive effect derived from eliminating currency overvaluation and the negative balance sheet effect associated with currency depreciation in the face of an overhang of sizeable external foreign currency liabilities.

At the Eurozone-wide level, we have discussed spill-over effects both in the form of bank losses and official sector (public) losses. In addition, we touched on potential costs associated with breakdown in European political processes (Appendix VI).

The table in Box 7.1 attempts to summarise the key effects captured in our various estimations. Since we cannot claim to have estimated the effects in a quantitatively definitive manner[14], we use a three-tier system to illustrate the rough magnitude of the effects involved: Very Large (+++), Large (++) and Moderate (+), with similar scaling applied for negative effects.

Summing up our cost-benefit analysis for individual exits

Using the overall table as guidance, there are no obvious break-up scenarios which stand out as uniformly beneficial at the country level, without creating significant negative spill-over effects to the rest of the Eurozone.

Before we turn explicitly to possible reconfigurations, it is useful to look at the key differences in terms of the estimated effects from individual country exits. We focus mainly on possible exits by the countries which could stand to benefit (looking at trade effects alone) from currency depreciation. The seven countries in this group are: Greece, Portugal, Ireland, Spain, Italy, Belgium and France (as detailed in Appendix III). For completeness, we also go through the effects associated with a German exit.

Greece, Portugal and Ireland: Exits would appear to be manageable at the regional level. But balance sheets effects could negate positive trade effects at the country level in the exiting countries.

The positive effect derived from elimination of FX overvaluation could be very large for Greece and Portugal (and large in Ireland, where FX overvaluation is already partially corrected through internal devaluation). In all three countries, however, there are very large negative balance sheet effects involved (although the composition between private and public sector external debt varies). The implication is that debt restructuring and/or special financing schemes, would have to feature in an

[14] Some of our methods are entirely new, in that we explicitly incorporate legal constraints associated with redenomination in a quantification of important macro effects. This allows us to more precisely quantify the relevant exposures, which would create macro-level balance sheet effects in a break-up. At the same time, we realise that our method is new, and leaves scope for future refinement. In this regard, we are encouraged that leading academic economists (judging from the requests we have had for the underlying data) are starting to embrace our underlying approach. This means that we may soon have a larger set of independent estimates of the key balance sheet and spill-over effects.

exit scenario for those two countries in order to secure positive output dynamics following exit. Interestingly, the Eurozone-wide spill-over effects would generally be moderate (although official sector losses in Greece's case could be large, up to 3% of Eurozone GDP). Finally, political costs at the Eurozone level would likely be moderate. There would be potential issues with maintaining EU level cooperation, depending on whether withdrawal is multilaterally agreed. But relative to exits from larger countries, these would be at the moderate end of the spectrum.

Spain and Italy: Exits would be more difficult due to larger spill-over effects to other Eurozone countries, but would likely still be manageable. Balance sheet effects would tend to negate the positive effect from currency depreciation in Spain, but less so in Italy.

In relation to Spain and Italy, the impact on trade from currency adjustment would be positively large. Interestingly, there could be significant differences between Italy and Spain in terms of negative balance sheet effects. Spain would see large negative balance sheet effects, while balance sheet effects in Italy's case would be smaller. This suggests that from a country specific perspective, the exit option stands out as more attractive for Italy. Turning to the spill-over effects, the bank losses will be large in Italy's case, due to the large exposure of French banks to Italy (losses could be in the region 3% of French GDP). In Spain's case, bank losses will be more moderate, except for Portuguese banks. The wild-card is the political effect: can cooperation in the Eurozone and within the EU continue if Italy, a founding EU member country, such as Italy, leaves the currency union? Clearly the risks are elevated.

France and Belgium: While potentially beneficial at the country level, exits would induce large negative spill-over effects to the rest of the Eurozone and potentially ignite very negative political dynamics, undermining the benefits of exits.

France is one of the few countries which could benefit significantly from a less overvalued currency, but at the same time would not suffer meaningfully from negative balance sheet effects. The problem, however, is that it could see large spill-over effects through bank losses (particularly in Belgium and Germany), and through a breakdown in political cooperation. A unilateral French withdrawal and depreciation would potentially create risk of a breakdown in EU level cooperation, including trade tensions within Europe. Belgium is closely linked to France in various ways, and key EU institutions are based in Brussels, making exits extremely politically difficult. In fact, an attempt for France to exit could possibly trigger implosion of the Eurozone from the core, and involve a full-blown break-up, whereby the Euro would cease to exist.

Germany: A special case, with negative trade effects, and no standard balance sheet effects, but potentially significant losses on external assets for domestic banks. In addition, there could be special negative effects through destabilisation of the entire remaining Eurozone.

Germany would likely suffer through a large appreciation of its currency (the trade effect) but the standard balance sheet effect would not be an issue (by definition given currency appreciation). Meanwhile, the spill-over effect would work in reverse. German banks would face simultaneous FX losses on all relevant foreign assets (amounting to around 2% of German GDP). Additional losses would result from financial instability and increased defaults in the remaining Eurozone, as illustrated in the main text, and in Appendix VI. The benefit for Germany would come through avoiding participation in a further socialisation of losses (including the implicit socialisation through TARGET2 balance build-up) and from regaining full control over monetary policy.

Box 7.1: Cost-benefit metrics for individual country exits from the Eurozone

Exiting country:	Country-specific Effects		Eurozone-wide Effects		
	Reduced FX overvaluation	Balance sheet mechanism	Spillover		Political risk
			Bank losses	Public losses	
Austria	Indeterminate	Indeterminate	**Large** - -	Indeterminate	**Moderate** -
Belgium	**Large** ++	Indeterminate	**Large** - -	**Moderate** -	**Large** - -
Finland	Indeterminate	**Large** - -	**Moderate** -	Indeterminate	**Moderate** -
France	**Large** ++	Indeterminate	**Very large** - - -	**Moderate** -	**Very large** - - -
Germany	**Large** - -	Indeterminate	**Large*** - -	Indeterminate	**Very large** - - -
Greece	**Very large** +++	**Very large** - - -	**Moderate** -	**Large** - -	**Moderate** -
Ireland	**Large** ++	**Very large** - - -	**Moderate** -	**Moderate** -	**Moderate** -
Italy	**Large** ++	Indeterminate	**Large** - -	**Moderate** -	**Very large** - - -
Netherlands	Indeterminate	Indeterminate	**Large** - -	Indeterminate	**Large** - -
Portugal	**Very large** +++	**Very large** - - -	**Moderate** -	**Moderate** -	**Moderate** -
Spain	**Large** ++	**Large** - -	**Moderate** -	**Moderate** -	**Large** - -

* In the case of Germany, spill-over effects would fall on the German banking system itself, and involve FX losses in relation to exposure to all other Eurozone countries. See Appendix V, p. 106 for detailed explanation of categorisation.

Each row in Figure 7.1 shows the effect of an individual country exit from the Eurozone. For example, the first row shows the various effects associated with Austria exiting the Eurozone. These effects should be interpreted as output effects. Since the metrics used should not be regarded as precise or final, we use a general three-tier classification into moderate (+), large (++) and very large effects (+++), or the equivalent tiering for negative effects. Cells are labelled as "Indeterminate" in cases where the effect is not significant.

Each column represents one of five effects resulting from a break-up. The two first columns represent country specific effects, while the three last columns represent spill-over effects to the remaining EMU countries.

Reduced FX overvaluation: This effect captures the output effect from currency depreciation in an exit scenario. A country with a strongly overvalued exchange rate currently stands to yield a *Very Large* positive output effect.

Balance sheet mechanism: This effect captures the output effect from balance sheet losses in an exit scenario. A country with large relevant external liabilities will face a *Very Large* negative output effect.

Spill-over effects from bank losses: This effect captures the negative implication for financial stability and output through spill-over effects to other EMU countries (or itself, in Germany's case) through bank losses.

Spill-over effects from public losses: This effect captures the negative implication for sovereign finance, financial stability, and output through official sector losses in other EMU countries.

Political risk: This effect captures the disruptive impact of a break-down in political cooperation within the Eurozone and the EU on output in other EMU countries, as well as the exiting country itself.

The measures in the first four columns are derived through an objective scoring system outlined in Appendix IV, based on the data analysis in Chapters 5 and 6 and Appendix IV. The quantification of the political risk effect is subjective, but based on the analysis in Appendix VI.

Ex post optimal reconfiguration

Many analysts and commentators have strong views on the feasibility and desirability of a break-up of the Eurozone. A common view, at least until recently, has been that any form of break-up would cause extreme and destabilising capital flight, and for this reason a break-up should be avoided at all costs. We agree with the notion that what constitutes an optimal currency area ex ante is not equivalent to the optimal reconfiguration ex post, given transition cost associated with breaking down the current structure. However, we do not agree that the possible risk of destabilising capital flight should preclude any proper analysis of whether a break-up may be desirable.

The problem with this argument is that we are already seeing destabilising capital flows well ahead of any actual break-up. As we explain in Chapter 8, it is not clear that the break-up itself will create an uncontrollable additional deterioration, although it could if mismanaged. There will be significant additional transition costs, but there is no strong basis to suggest that such a process would be significantly more unmanageable than the highly unstable path we are already on. Regardless of the final outcome, the longer it takes to find a solution—involving either break-up, integration, or a combination of the two—the more the costs will accumulate.

We think an exit of the smaller peripheral countries, such as Greece, Portugal and Ireland, would be manageable based on the size of spill-over effects. Further exits of Spain and Italy would also be possible, although spill-over effects to certain core banking systems would be large. Further exits involving France or Belgium, however, would involve very large spill-over effects, and incite risk of institutional breakdown and possible full-blown break-up, which would be prohibitively costly.

A possible configuration involving Germany, Austria, Netherlands, and Finland (i.e., without France and Belgium) would likely be one of the more stable configurations, from a political standpoint. However, many of the smaller nations are likely to be more comfortable with an arrangement where French and German interests counterbalance each other. We are thus faced with two possible configurations: the Northern region and one which also includes France and Belgium. But political considerations probably make it most likely that Belgium and France remain in the core[15].

This leaves the ex post optimal configuration as one which involves 3-5 exits from the group of GIIPS countries, with Greece almost certainly among the exiting countries. Which specific countries stay and which countries exit will ultimately be a political decision. The decision will be based on the views of the exiting countries (including willingness to give up sovereignty) and on the willingness of the core countries to provide transfers to keep current members inside the currency union. Since capital flight is already escalating, and since an initial exit is likely to lead to further escalation and instability, it would be a far superior outcome to execute needed exits all at once, rather than sequentially.

As it turns out, the optimal reconfiguration outlined here, involving essentially the simultaneous exit of the majority of GIIPS countries, is broadly consistent with findings within the empirical OCA literature (Bayoumi et al. 1992). That is, our analysis of which reconfigurations are feasible and potentially attractive from a cost-benefit approach (that take into account the importance of growth recovery in the current crisis setting), happens to yield similar conclusions to those from the literature on what would have constituted an optimal currency area ex ante in Europe.

Over the next 4-6 quarters, European policymakers are likely to face the decision of who should remain and who should exit the Eurozone. The decision will combine choosing the new configuration and cementing the currency union for the remaining countries, including potential socialisation of future losses (i.e. common deposit insurance, Eurobonds, etc). In the face of inaction, the path ahead will be one of increasing risk of full-blown break-up.

[15] Having France as part of the core would counterbalance Northern European states desire not to fall under complete German hegemony. One relevant issue here is the core difference in attitudes towards government between the Germans (and other Northern Europeans) and the French. While these competing opinions have been of limited consequence in the Eurozone of the past decade, they will be a source of great potential tension going forward given the need for further integration in the core.

Part III:
Managing transition

Chapter 8:
Preparedness and contingency planning

Irrespective of whether the break-up is a limited break-up or a full-blown break-up, the transition process involves a large number of inter-related issues. Beyond the specific issues related to currency separation, there are important issues around controlling capital flight, stabilising banking systems and supporting government bond markets. The inter-connectedness of the key issues requires a holistic plan, and we outline key elements of such a plan below.

Only an all encompassing plan, as opposed to piecemeal fire-fighting, will effectively minimise transition costs associated with exits and redenomination, whether it is exit or full-blown break-up which is chosen. However, before we go into detail with the specific necessary steps in the transition process, it is helpful to outline our method. The break-up process will inevitably involve many steps, including those immediately pre- and post-exit stage (Scott 2012, Dor 2011). Figures 8.1 and 8.2 show pre-exit planning stages and responses to negative stakeholder reactions, and post-exit stabilisation, respectively. We also outline optimal configurations in Part II, giving motivation for the target union post exit.

The importance of preparedness and contingency planning

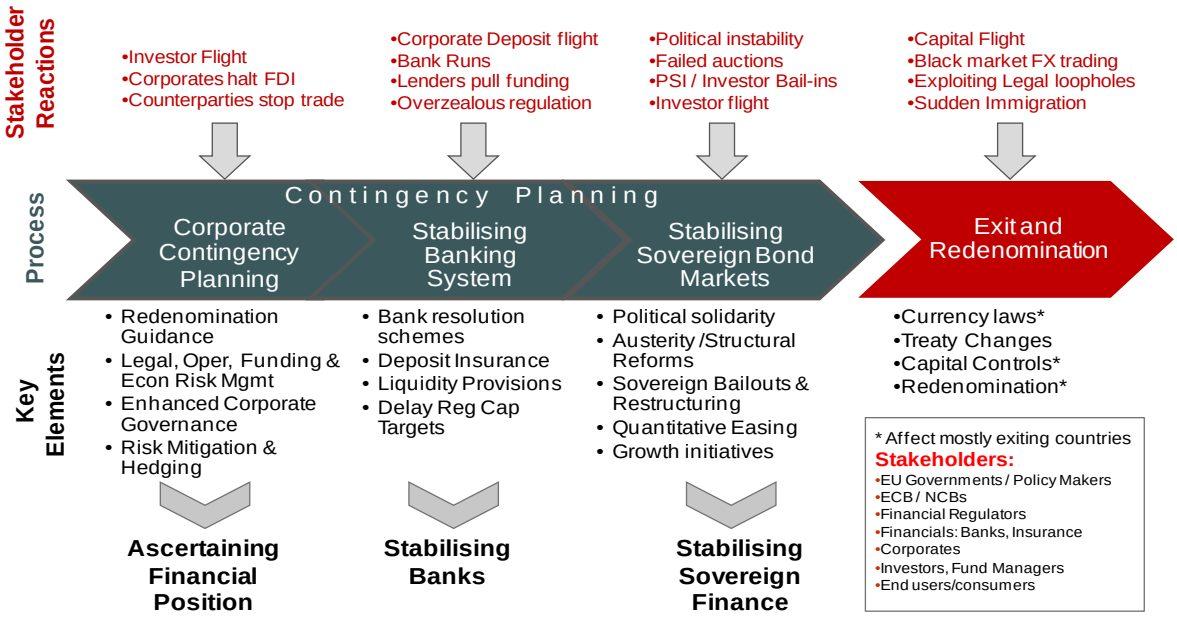
Policymakers are facing a dilemma. Going unprepared into an exit will lead to significant costs. Preparing for an exit, however, may be self-fulfilling and counterproductive, possibly leading to an inability to achieve any optimal reconfiguration due to ongoing market and economic pressures.

The solution to this dilemma is to design contingency plans using a risk management approach. The future of the Eurozone remains unknown, and will largely be dictated by political decisions, including future election outcomes. What is needed is a set of contingency plans which can prepare Eurozone members for various exit scenarios, without signalling the likelihood of specific scenarios. Contingency planning reduces the financial and legal uncertainty over investment and business in the Eurozone.

The big advantage of such planning is that it can be done openly. If designed carefully, and communicated properly, this preparatory work does not in itself signal that exit or break-up is a certainty. The risk management steps we outline are both prudent measures and means of reducing systemic risk and calming the ongoing crisis, regardless of whether break-up is a surety or merely a risk. We note that many of these measures we describe as necessary are already underway, partly at the behest of regulators, and partly due to market and economic forces.

A break-up of the Eurozone is hardly going to be a smooth process. Nevertheless, the quality of the preparation will be crucial to minimise the degree of disruption. Only after undertaking prudential controls and bolstering the means of handling systemic shocks from the sovereign and banking crisis can policymakers determine that the EU can withstand the shock. The final steps of exit or break-up are executed rapidly and under veil of secrecy. And subsequent to an exit or break-up, the preparatory elements will come into play to immediately stabilise the banking system(s) and the sovereign markets and reduce mass insolvencies of firms, while relying on new elements under the control of the NINCBs and the exiting governments.

Figure 8.1: Managing the process: Preparations and Exit



Source: Authors' conceptions, with input from FA Consulting

Avoiding unnecessary disruption and costs

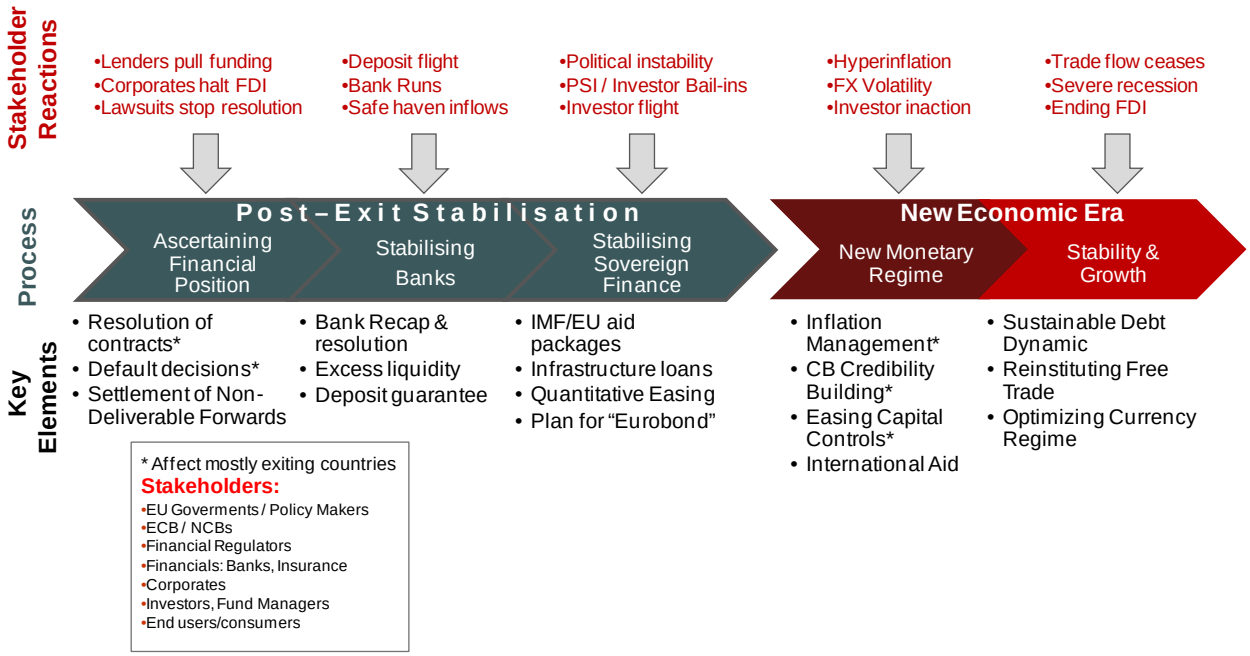
Potential legal disruptions and associated costs

In a disorderly break-up scenario, with little forward looking guidance on the redenomination process, court decisions on redenomination are likely to be inconsistent, potentially arbitrary from an economic stand-point, and they are likely to be very slow. This would be a worst case outcome.

The fall-out from a disorderly redenomination process, for which market participants would have had little chance to prepare, would likely be to trigger a large number of technical defaults and bankruptcies. Importantly, a significant portion would be arbitrary and unnecessary, linked to specific court decisions and affecting otherwise viable companies.

This legal uncertainty is a form of Knightian uncertainty (Davis 2011), leaving investors expecting far higher risk premia and effectively pricing to worst (Al-Najjar 2011). Overall, this would raise the risk of more severe than necessary banking crises, creating a negative impact on actual and potential growth for a prolonged period of time.

Figure 8.2: Managing the process: Post-exit stabilisation and a new economic era



Source: Authors' conceptions, with input from FA Consulting

Potential costs associated with balance sheet effects and lack of hedging

The huge size of Euro-denominated assets and obligations (as illustrated in Chapter 3) would create new open currency exposures in a break-up scenario. We have quantified these exposures in detail in Chapter 6, and it is clear that they exceed, by a wide margin, the exposures in place in emerging market currency crises in the past. Combined with the current inability to hedge those exposures (as discussed in Chapter 9), this suggests that a wave of bankruptcies would be globally as a function of losses on new currency exposures, especially in those countries with the most relevant external (i.e., foreign law) liabilities.

In the extreme case of a full-blown break-up of the Eurozone, where the Euro would cease to exist, there would be an additional risk. In such a scenario, tens of trillions worth of obligations governed by English law and New York law would be stuck in redenomination-limbo. With no simple and remotely fair way to effect redenomination in that scenario, we would be faced with prolonged legal proceedings. During this time, financial market participants would have no way to value some of the biggest exposures on their balance sheets. Most likely, courts would be overwhelmed, resulting in failure to quickly resolve payments on millions of financial contracts. The most likely implication of such a disorderly redenomination process would be a complete freezing of the financial system, not only in the Eurozone, but also globally.

Corporate contingency planning

The first set of steps involves contingency planning, risk assessment, management and mitigation, enhanced corporate governance including stress testing, scenario building, task force creation (rapid response teams) and opening lines of communication with policymakers. These risk management and contingency planning exercises all follow from a set of established guiding principles for how redenomination of Euro-denominated assets and obligations will ensue under local and foreign law in various break-up scenarios. This is described in some detail in the guidelines on legal principles underlying redenomination. This first step is public and all regulated financial firms will be required to make such plans.

Financial macro-prudential oversight instructing regulated financial firms to take stock of each category of risk would affect efficient preparedness by market participants, helping to avoid triggering bankruptcies and other disruptions.

In particular, in order to ensure ease of redenomination in the event of break-up, we propose the following novel elements to contingency planning:

Communicate redenomination guidance

National regulators (and legal counsel) communicate guiding principles for redenomination of Euro-denominated assets and obligations, including a possible role of a new **European Currency Unit (ECU-2)** for settlement of Euro foreign law contracts only in a full-blown break-up scenario.

A new ECU-2 would play an important role in facilitating an orderly redenomination process for the myriad of contracts and obligations under foreign law without a clear country specific nexus in a full blown break-up scenario where the Euro ceases to exist. The ECU-2 would be mechanically linked to the performance of new national currencies of Eurozone countries in accordance with a pre-determined weighting scheme. The ECU-2 would play a crucially important role in facilitating efficient redenomination of foreign law contracts, and would thereby serve to minimise unnecessary insolvencies due to protracted legal battles about redenomination issues and due to losses on new currency exposure, some of which could be purely a function of unpredictable court decisions.

While it is probably not possible for EU policy-makers to communicate intent on an ECU-2 directly, national regulators (being independent) can broach this as a possible solution to redenomination of English law EUR contracts via working papers and discussion papers, (as we have seen with ECB communication around possible exits (Athanassiou 2009)), with more formal consultations by regulators about the likely impact, should break-up be more certain.

We note that the ECU-2 notion has no bearing on the discussion should a Euro continue to exist, irrespective of how small the region actually is. In particular English law instruments should continue to be settled in Euro if there is a Euro. The ECU-2 is merely a device for settling the conundrum of how to determine payment should there be no Euro.

Risk management and enhanced corporate governance

National regulators mandate that regulated firms must assess and monitor the legal and contractual, financial (i.e., funding and liquidity management), operational (e.g., IT issues and ability to make payment in variety of new currencies, via new payment systems, etc.) and economic risks and provide ongoing monitoring of these as well as counterparty credit risks. By assessing assets and liabilities, bucketing them into various currency buckets, and determining how each will behave under various break-up and exit scenarios, firms will have identified the key areas of focus immediately after such exit.

Regulated firms must **create rapid response task-forces** for dealing with every eventuality in a possibly messy break-up and these must be charged with taking responsibility over key decisions. Preparedness must be enhanced by scenario building and stress testing critical business and operational lines.

Moreover, **communication lines to policymakers** and regulators must be initiated so that, immediately after an event, policymakers can be informed as to ongoing operations, bottlenecks, challenges and difficulties, especially those overcome by policy intervention.

Preservation of shareholder value is incentive for non-regulated firms to undertake similar contingency planning. Public broadcasting of preparedness and reduction of uncertainty reduces risk premia both theoretically and empirically.

Combined, these steps will reduce both the corporate's own operational uncertainty and as well as systemic uncertainties associated with contagion.

Hedging and risk mitigation

Regulators should encourage regulated firms to take part in private hedging markets for hedging intra-Eurozone currency risk, through NDF contracts. Due to market incompleteness, certain risks (intra-Eurozone currency risk) cannot be hedged. This is crucially important for exit candidates, such as Spain, where the private sector has large implicit foreign currency exposures. In the absence of any ability to hedge and share risk with holders of foreign currency assets, the exit could create significant balance sheet effects, likely involving a wave of bankruptcies too (as detailed in Chapter 5).

On this basis, a hedging market for intra-Eurozone currency risk has potential to provide a new avenue for risk sharing, through creating a non-deliverable FX forward (NDF) market for potential new national currencies of current Eurozone member countries. As we outline in Appendix VIII, the creation of the NDF market will allow corporates to hedge their intra-Euro exposure and net or mitigate the financial risks associated with exit or break-up. Moreover, this will encourage firms to halt more rapid deleveraging, giving them the option to hedge their current FDI in possibly exiting countries.

We note that this product is already in final phases of development and is likely to start trading in OTC form during June. Hence, the creation will require no government involvement as such. However, it would be helpful if key countries encouraged risk sharing between sectors domestically. For example, local asset manager with (implicit) foreign currency assets should look to lock in some of the upside involved in appreciation on foreign currency assets, by selling the hedge to corporate sector entities with (implicit) foreign currency liabilities. The NDF market should ensure that firms that need to hedge and are willing to pay (as well as those which are overly hedged or have risks the other way round) can transact, thus lowering overall systemic risks. This could dramatically reduce the corporate exposure to balance sheet related devaluation concerns (as highlighted in Chapter 5). Those countries whose corporate sectors have the larger net foreign liabilities have the most to gain by corporates' hedging, and by doing so reduce the net balance sheet constraint on devaluation.

Stabilising the banking system

The second major area involved in ex ante efforts to enhance preparedness involves policies to stabilise the banking system. The banking and financial balance sheets are often cited as the means by which most financial contagion travels. And clearly large-scale liquidations and deleveraging will have more endemic effects. The European banking system is woefully underprepared for even the more minor issues of the sovereign crisis, with resolution plans merely drafted and only partly implemented into national law. This piecemeal approach has also allowed some countries to weather the crisis and ongoing rescue operations far more easily than others.

The steps involved in this stabilisation (many of which are underway) include:

Bank resolution schemes

In particular, EU policymakers must adopt a directive to ensure that bank resolution schemes are implemented into national law. These schemes must be modelled on the lines of those adopted by the UK, Germany, and Ireland, and allow for regulators to take ailing banks and divide them into:

- **Good banks** (with secured debt, deposits and 'good' assets), with an EU-wide deposit insurance and other backstops covering losses (e.g., with direct ESM support), effectively socialising rescue of depositors EU-wide, and

- **Bad banks** which can be (less capital intensive) investment companies which contain all subordinate liabilities (e.g., senior debt, sub debt and any remaining equity tranches) and questionable assets. Bad banks will then be run-down over time with shortfalls being covered by liability management exercises (e.g., buybacks of certain debt tranches) and bail-ins, and sovereign backstops with indirect ESM support, effectively socialising losses of bad banks to the sovereign rather than EU-wide.

Deposit insurance

EU wide deposit insurance (recently proposed by the EU) would be a first line of defence for bank insolvencies or bank runs. These must be backstopped (up to specific deposit limits) by the EU budget (much as is the case for EFSM or EEC bonds) or by a specifically dedicated fund of governmental guarantees.

ECB/NCB liquidity provisions

For banks with weak administration and failing the rapid approval of EU-wide bank resolution schemes, liquidity issues must be addressed as need be, with the ECB and other NCBs facing more questionable counterparties on less valuable collateral. Governments will have to indemnify the ECB to allow the ECB to protect its own balance sheet in facing unresolved banking situations. Finally, these credit easing policy measures must be in the context of further monetary loosening and liquidity provisions, aimed at stabilising the financial system and, in an emergency situation, stemming the possibility of bank runs.

Delay regulatory capital requirements

While future financial stability would require building up regulatory capital, the drive towards increasing capital requirements during a crisis and the induced deleveraging are merely the sources of yet further contagion. Regulators should delay requirements to full adherence to Basel III and other protocols to new regulatory capital requirements until sovereigns are fully able to fund themselves without the support of their national banks.

Stabilising the sovereign bond market

The third ex ante area of preparation is to stabilise sovereign bond markets. Due to the ongoing political dimensions of the ongoing crisis and the fact that the sovereign debt crisis has gone on for so very long, measures have been insufficient to shore up confidence. New steps needed to handle the extent of any post-exit moves include:

- **Political solidarity**: Unified decision making of core Eurozone sovereigns.
- **Sustainable debt dynamics:** Moves should include continued fiscal consolidation, with some room towards more growth enhancing measures, and structural reform measures (to boost potential GDP and ensure long-term convergence in productivity). PSI and OSI for those countries that should remain in the Euro. PSI should not be used to introduce foreign law bonds in any country which may be a possible exit candidate (as did happen in Greece in March 2012, further complicating an exit). Growth initiatives which could lessen the extent of the austerity measures, or delay full adherence to the SGP until the far distant future.
- **Sovereign Bailouts**: Increase capacity of sovereign bailouts and structuring them so that the bailout loans remain subordinate to private bondholders, should support be used to buy bonds for otherwise solvent nations (Firoozye 2011). Prepare for further market intervention by EFSF or ESM and ECB, should the need arise.

- **Quantitative easing**: Prepare for unsterilised ECB intervention through preannounced size and duration or at unlimited size at preannounced target yields or yield caps (thereby guaranteeing solvency of the stressed sovereign's budget and ensuring subordination issues are no longer a valid concern for the market). Continued concern over moral hazard can be addressed by providing excess liquidity to the ESM which can impose conditionality and buy the ECB political cover for its operations.

Each of these elements can be used to stabilise the market prior to any planned exit. While the moral hazard issue does arise, concerns over moral hazard are a luxury left to more stable times and concerns over contagion should prevail at this juncture. Finally, the issue of exit or break-up is not entirely economic, much in the same spirit as the actual entry into the union, which was arguably made for political rather than economic reasons.

As many of these elements outlined above can and should be undertaken in the context of the sovereign debt crisis alone, especially those elements involving corporate and systemic contingency planning to any and all extreme events, they do not signal exit or break-up. But ensuring that each of these items is in place is crucial to ensure that exit can be handled smoothly.

Post-exit actions

Contingency planning will allow the following post-exit actions to happen almost immediately, without operational and political delays causing significant economic costs.

Ascertaining financial position

Post exit, it is of crucial importance for firms, in a challenging and fast moving environment, to follow through on the prudential plans. Corporates will have to call together their specialised task forces to handle the immediacy of decisions needed to ensure that the firm continues to operate smoothly and efficiently. In terms of follow through, these actions comprise three major areas: resolution of contracts, default decisions and settling NDFs.

Resolution of contracts: Firms will largely be aware of which assets and liabilities will redenominate and will take the operational changes needed to ensure that they can continue to handle transactions in the new currencies. The hundreds of billions of Euros of back-to-backs and securitisations will be of particular challenge; back-to-backs have different governing laws which make them "economically equivalent" but not legally equivalent.

In the case of EU break-up, having legal certainty of settlement of the EUR denominated contracts which are in English or other (non-local) law will allow investors to unwind and take losses or consider the choices available to them, rather than to be weighted down by the legal uncertainty and unable to make crucial decisions. Our proposal is the issuance of an **EU directive to introduce a new ECU** under these circumstances (as described in Appendix VII).

There will be major types of securities and obligations where gains or losses are only subject to judicial decision. It is crucial that policymakers have already isolated key and **simple precedent setting transactions** well in advance so that, post exit, these can be decided rapidly and authoritatively by the appropriate court. It is only through rapid and equitable decisions that the EU can move forward rather than be weighted down by a morass of uncertainty post-exit. As we discuss in the appendix, political and legal uncertainty produces a large risk premium. It is this risk premium which is an indication of a slow-down of investment. Post exit, the longer this resolution process, the more likely adjustments will be more damaging.

Default decisions: After assessing foreign versus domestic liabilities and obligations, firms will decide whether national law (either via bankruptcy protection or if international judgments can no longer be readily enforced) affords them protection to default on overly expensive foreign obligations. Key decisions could include pulling credit lines on key customers, declaring institutions or counterparties to be in default, taking measures to prevent one's own default by technical or

operational reasons, or restructuring or defaulting on external law debt if need be, and closing out all non-economic transactions.

Settling NDFs: The non-deliverable forward contracts which we proposed for risk mitigation will be settled between firms and used to mitigate some of the exposure of redenomination risk with transfer payments between firms helping to lower systemic risk. This would effectively allow those who faced windfall gains on redenomination to give up some of these gains to those who faced losses.

Stabilising banking systems

Irrespective of the contingency planning which may take place, the banking system of both the exiting and the non-exiting countries will be in need of yet more bailouts. Our proposal of preparations comes into play post-exit with **bank resolutions**, **recapitalisations** (via ESM for non-exiting countries), ECB and NINCBs pumping in **excess liquidity** as need be, and the use of any **deposit insurance** scheme if it has been adequately capitalised (or further excess liquidity from the ECB and NINCBs if it has not).

Finally, should the sovereign have significant portions of non-local law debt held by its own banks, it will seek to switch the banks to more easily serviced local-law debt before possibly defaulting on the foreign obligations.

Stabilising the sovereign bond market

The elements used to prepare for sovereign rescue can now easily be unveiled or used. But in addition to the measures listed in contingency planning, the sovereign bond rescue will now be forced to take a much larger role in ensuring that sovereigns can fund at reasonable levels and remain solvent. The need for such stabilisation should be acute during the initial stages of the exit or break-up, and other than the elements mentioned in the pre-exit preparations and post-exit it should also entail:

1. **Quantitative Easing** (NINCB), ESM interventions (through ECB).
2. **Infrastructure loans** to circumvent national finances.
3. **IMF and EU aid packages** for exiting sovereigns, including the means of recapitalising foreign reserves.
4. **Announcement of "Eurobond"** or (possibly limited) fiscal union such as the European Redemption Pact (Bofinger et al 2011), allowing for limited temporary joint-and-several Eurobonds with strong conditionality and return to national bond markets and (coordinated but independent) fiscal policy thereafter[16].
5. **Default decision on foreign law bonds:** In order to avoid becoming unduly burdened by expensive foreign-denominated obligations, sovereigns may have CACs, allowing the issuer to call a bondholder committee and propose restructuring alternatives (i.e. redenominated debt) with implicit threat to default. If faced with sufficient holdouts, governments will need to take steps ensuring that they have limited value of assets abroad, and possibly default.

[16] This appears to overcome both German constitutional constraints with the Bundestag deciding extent of commitment, while addressing EU sovereigns' concerns over permanent loss of sovereignty to an EU super state with permanent Eurobonds.

Applications to a Greek Exit

While we have kept the discussion of mechanics deliberately general, and are consequently able to address Greek, or say, Portuguese exit as well as the extremes of a full-blown break-up, we note briefly that Greek exit is considerably less complicated in some ways. In particular, if a Euro continues to exist, foreign law contracts will be paid in Euros for the most part (except in the rare cases where the contracts are clearly and explicitly tied to Greece).

Meanwhile, preparation is clearly underway, although it is clear that many of the optimal steps we mention are so far incomplete or entirely unaddressed. The lack of preparedness will require far greater involvement from the ECB in the near-exit and post-exit phases if a period of destabilising capital flow in the rest of the Eurozone, including risk of full-blown break-up, is to be avoided.

As outlined in our general framework, the preparatory steps come to play subsequent to exit and redenomination, thereby settling uncertainty in contracts and payments and stabilising the banking system of the remaining Eurozone with moves toward the introduction of Eurobonds of some limited form (for instance, the European Redemption Pact (Bofinger et al. 2011)). Finally, Greece itself will have to seek IMF and EU aid in the process of exit and redenomination to bolster its banking sector, ensure infrastructure development, and recapitalise its central bank reserves. Due to the complex nature of Greece's English-law PSI bonds and the relationship to the EFSF, it may be necessary to switch Greek banks' holdings from PSI bonds to some new local law bond before defaulting on the EFSF and PSI bonds, which may become prohibitively expensive to service. We address issues of currency laws, capital flight, and the actual mechanics of redenomination in the following chapter.

Chapter 9:
Managing exit and capital flight

Once the political decision to exit has been made, policymakers must prioritise achieving an orderly redenomination process and avoiding disruptive capital flight. At this point, the process will have clearly moved beyond contingency planning, and various crisis measures would need to be kept secret, until actual implementation. We first touch briefly on currency separation, and then we turn to the controversial topic of how to manage capital flight.

Currency separation

The issue of how to achieve an orderly currency separation process is dealt with in the literature in some detail. For example, the Czechoslovak currency separation in early 1993 has been regarded as a good example of an orderly redenomination process, and the template from Czechoslovakia has since been used by the IMF to advise Moldova on its split from Romania (Dedek 1996). Moreover, historical analysis can serve as a guide to addressing logistical issues around transition to a new physical currency (notes and coins). For this reason, we will not go into great detail on this subject[17].

However, there are some special considerations in connection with a Eurozone break-up. In relation to the legality of exit, there is a debate around whether Article 50 in the Lisbon Treaty can be used by a country to legally leave the EU and the Eurozone. There may as well be other methods for "opting out" using the Vienna convention on the Law of Treaties[18]. Given the need for expediency, it is likely that exit is either unilateral or is completed prior to formal approval by Eurozone partners. Later on, however, it could be formalised via treaty change, which could clear up a range of challenges during and immediately after exit (Scott 2012).

In relation to whether physical currency/stamps can be printed ahead of time, there is an issue of the feasibility of secrecy. This may entail some risk, but it has been done before. In the Czechoslovak case, for example, new Czech notes (specifically the stamps to be attached to old notes) were ordered more than six months before they were actually needed, and well before the political decision of currency separation had been made, as a part of the Czechoslovak State Bank's contingency planning (Dedek 1996).

Finally, there is an important caveat, which relates to Gresham's Law. Exiting countries, such as Greece or Portugal, would almost certainly see significant depreciation of their currencies relative to the remaining Euro in a limited break-up scenario (see Appendix III). This implies that there would be little economic incentive for citizens in exiting countries to convert Euros to the new currency, either by getting new notes or by getting stamps on existing notes. For this reason, the exiting country needs legislation forcing residents to exchange Euro cash for new national currency (bank deposits are harder to hide, and will be easier to redenominate for that reason). The alternative to stamping locally would be to stamp in the non-exiting Eurozone countries. This would conceptually get around the incentive issue (the disincentive to convert good currency for bad), but

[17] Some of the key elements to exit would involve passing a currency law under a veil of secrecy, enacting bank holidays and exchange closures as the new currency becomes legal tender, during which time all locally domiciled residents are required to exchange their Euros for new notes and coins (or alternatively have them stamped), forcing all economic agents to convert under penalty of a fine, and sealing borders/monitoring border posts for fleeing currency.

[18] See Dor (2011). We note that France, Malta and Romania are not signatories to the Vienna Convention, and this may complicate the international acceptance of Vienna-based methods of exit. Scott (2012) states that there is no internationally acceptable legal means for exiting the Euro other than via the TFEU or through treaty amendment.

it would raise logistical issues, as it would require simultaneous stamping in the remaining 16 Eurozone countries (assuming just one country exits).

Managing capital flight

Large one-off currency moves have potential to generate large capital shifts. This was the experience during the ERM crisis, when pegs broke in Asia during the Asian crisis, and in many other departures from pegged exchange rate regimes in emerging market countries in the past. Linked to this, there is a fear that any hint of the possibility of a Eurozone break-up will similarly ignite large, and potentially destabilising, capital flows.

Before we turn to the specifics of what can be done to prevent capital flight (in the box), it is instructive to make a few observations about the behaviour of Eurozone capital flows and about some of the key concepts involved.

The dynamics of capital flight in the Eurozone

A key observation in relation to Eurozone capital flows is that *capital flight has already reached a mature phase* in some cases.

We can use Greece as an example, to illustrate the fundamental point:

- Foreign portfolio investors have largely exited Greece, as a function of active sales, redemptions, and haircuts on remaining exposures. We can use Japanese data to illustrate this point[19]. As of end-2009, Japanese investors held EUR5.7bn of exposure to Greece, while the latest data as of March shows that the exposure has been reduced to EUR0.1bn, **a decline of 98%.**
- Global banks have dramatically reduced their exposure to Greece by refusing to roll over loans and by selling securities. In Q1 2008, the exposure of global BIS reporting banks to Greece was $225bn. In the latest BIS data from end-2011, the exposure dropped to $87bn, **a decline of 61%**, and that was even before the PSI process imposed severe hair-cuts on bank holdings of Greek government bonds.
- Domestic residents have reduced their exposure to local bank deposits notably over the last three years. Household deposits were down 26% and corporate deposits showed **a decline of 42%** as of March 2012 (before reports of accelerated deposit withdrawals appeared in mid-May). The domestic recession is a part of the explanation, but the outsized drop in corporate deposits is likely to reflect a switch to banks outside Greece[20].

These numbers clearly document that private sector capital flight started long ago and well before the Greek election result in May 2012 further accentuated the risk an imminent exit. In fact, the process of private sector capital flight is now so mature in Greece that it will be hard to see a further acceleration on a flow basis, simply because the outstanding exposures (from a stock perspective) are so significantly reduced already. In this context, we note that the various backstop facilities in place, including in the form of ECB funding, have allowed private sector capital flight to continue, without causing a complete economic collapse. This is the story in Greece, but it is also the story more broadly in the Eurozone, as we discussed in Chapter 6, in the context of official sector exposures.

[19] We use Japanese data to illustrate the general trend because it is more detailed and up-to-date than European statistics and because Japanese investors are among the biggest participants in global fixed income markets.

[20] In this context, it is worth making the general point that capital in the form of deposits tends to be stickier than other types of funding. This is well-known (it is the reason regulators prefer deposit funding to wholesale funding for banks), and it seems to be a feature in the Eurozone too, even if borders are open and capital movement remains unrestricted. The stickiness of deposits is one of the few features of the current setup which does not yet point to extreme capital flight when we look at the Eurozone as a whole.

Greece is obviously an extreme example; other countries have seen less severe capital outflows at this point. For example, foreign investors only started exiting their fixed income investments in Italy in the second half of 2011, and deposit outflows have only become meaningful in Spain in 2012. This means that there are still plenty of assets left for foreign investors to sell, and plenty of local deposits to move abroad in Eurozone countries other than Greece. This leaves significant scope for incremental deterioration in the capital flight dynamics.

Nevertheless, it is important to note that various degrees of capital flight have already happened in the Eurozone; it is too late to avoid capital flight altogether. The clear lesson from the capital flow picture in the Eurozone over the last few years is the following. Capital flight has gradually spread to more and more countries as well as to more and more assets. Moreover, while the initial capital flight was from the periphery to the core, the more recent evidence points to flight from the entire Eurozone[21].

Policy announcements and uncertainty as determinants of capital flight

We can put the above empirical observations in more conceptual terms:

- Capital flight is not a binary process, which jumps when a certain outcome (break-up) becomes pre-determined as a function of a policy announcement.
- Capital flight is a continuous variable; and increasing uncertainty will lead to – typically gradually – increased capital flight, regardless of whether policymakers acknowledge certain risks or not.

There is little empirical evidence backing the idea that contingency planning for a break-up (which will have only a minor impact on the perceived probability of a break-up) will cause major shifts in capital flows. This means that break-up preparation and contingency planning can be implemented as a risk management exercise (if clearly communicated as such) without in itself igniting additional capital flight.

In this regard, we note that expectations are already running well ahead of policymakers. For example, we have seen that spread-betting measures of the probability of some form of break-up of the Eurozone by 2013 has been in the 35-45% range for the majority of 2012 and spiking above 50% immediately after the first round of the Greek election[22]. Policymakers' recent admission that they are finally implementing contingency plans for a Greek exit had essentially no impact on the perceived probability of this event in the market. The genie was out of the bottle well before.

Uncertainty more generally, on the other hand, is bound to be a key driver of investor behaviour, especially since the uncertainties present today are of a type which investors did not contemplate. The uncertainties we are now facing were not incorporated into the original investment thesis behind foreign investor inflows in the Eurozone, and they certainly did not feature in a retail depositor's decision to put money in a savings account in a Eurozone bank. These are entirely new uncertainties, relating to risk of sovereign default, lack of credibility of deposit insurance, and possible currency devaluation. This uncertainty is bound to impact capital flight in a profound way, regardless of what policymakers say or pretend about the likelihood of break-up.

[21] This is the evidence from global capital flow statistics, see (Nordvig 2012(a), Nordvig et al. 2012), and it is also the message from the trends in global bond yield, which have seen Treasury and Gilt yields drop dramatically in May 2012 as a function of the renewed tensions in the Eurozone.

[22] See, for example, odds that "Any country currently using the Euro to announce intention to drop it before midnight ET 31 December 2013," as available on www.intrade.com.

Box 9.1: What can be done to reduce capital flight?

In this box, we focus on more specific steps that can be taken to reduce capital flight. When exit is imminent, capital flight can only be addressed in the form of strict capital controls. In the pre-exit phase, some more modest steps may ease the concerns of institutional investors. We note, however, that all these measures are shorter-term treatments of a symptom, rather than a cure.

Reducing capital flight among institutional investors (ex ante)

- **Use of English Law Securities:** Due to increased awareness of redenomination risk, corporate investors would be somewhat comforted if they had legal certainty that their assets and securities were not able to be redenominated. While recent stresses have led the (English law) Greek PSI bonds to drop in value immediately after the PSI, the vast majority of investors are comforted by the fact that they are English law and are pro-rata with the EFSF loans. Similarly, deposit flight by corporates would probably subside if corporates had the option to convert to English law documented deposits or CDs. This re-documentation would not altogether halt capital flight (as default is always an option and exiting governments may declare payment in Euros to be illegal) and would have little effect on consumer-level capital flight. Moreover, conversion could exacerbate balance sheet effects for departing sovereigns. Still, we believe the option to convert will, on the margin, keep more deposits within a sovereign's banking system.
- **Non-Deliverable Forwards (NDFs)**: The ability to hedge currency risk (or potential currency risk) is known to reduce balance sheet volatility and increase optimal levels of FDI. Moreover, hedging is the means by which firms demonstrate the strength of their corporate governance (see Appendix VIII for further discussion). As a whole, the existence of a hedging market will help to prevent rapid and damaging deleveraging.

Ex post steps to reduce capital flight

The possible negative signalling effect from the introduction of capital controls means that they can only be introduced secretly at the very last moment, although there may be extreme circumstances where they may be warranted pre-exit to minimise the damage from excessive volatility in capital flows.

In general, we propose the following elements in a multi-pronged approach. The aim is to stem the poor enforcement problem within the exiting country[23]:

- **Capital Controls:** The exiting country eliminates or taxes all cross-border transfers except for "verifiable" and acceptable reasons in limited size (e.g., on humanitarian grounds, transfers for purchases of foreign goods and services, transfers for citizens relocating abroad). As we have mentioned above, the exiting country will have to introduce restrictions on transport of physical banknotes outside of the exiting country, entailing the establishment of border checks.
- **Taxes on cross-border deposits:** The tax should affect newly initiated deposits; it would essentially amount to a (discriminatory) tax on deposit inflow into non-exiting countries, enacted bilaterally to avoid conflict with EU law. For example, Germany and Greece would agree that Germany taxes any Greek resident inflows into deposits, a policy which benefits Germany as well as Greece, as a means of further preventing some capital flight. The rationale is that Greek Euros stored as deposits are not being used for acceptable reasons. Since this goes against most bilateral investment treaties, these treaties will have to be renegotiated in the context of an exit from the Euro[24].

[23] Article 63 of TFEU (free movement of capital) is allowed to be circumvented temporarily under specific conditions. Moreover, Article 113 of TFEU empowers the commission to allow member states to take various more drastic (but temporary) measures to correct a balance of payments problem (Laver 2012). While these legal methods may exist, if treaty change is agreed as a means to allow exit, capital controls and other means of halting free movement of capital may be explicitly allowed by treaty (Scott 2012).

[24] If core countries wished to tax the inflows from exiting members on a multilateral basis, in theory this could be accomplished by simple agreement. Taxation is an area where the EU has minimal influence aside from discrimination (and taxes can distinguish between different taxpayers according to Article 65(1)), and therefore member states could agree to tax inflows from peripheral countries unilaterally without violating the treaty. Furthermore, with respect to tax discrimination provisions generally (not simply those applicable to capital movement), Article 112 allows for discrimination with regard to imports and exports if approved by the Council for a limited period. This provision should not be needed due to the aforementioned provisions regarding capital. It does, however, provide a back-up plan (Laver 2012), and it is likely to be more efficient in generating tax inflows, rather than outflows (as there will be a greater incentive to evade reporting the outflow level as opposed to the inflow level). This multi-pronged approach helps prevent leaky application of exiting countries' capital controls.

The real risk in relation to capital flight is the magnitude and duration of uncertainty. The worst case scenario is one of elevated and prolonged uncertainty about the future of the Eurozone, including the sustainability of sovereign finances in member countries. This most uncertain scenario would materialise in a process of sequential exits from the Eurozone. It would not be the individual exit itself, but the immense uncertainty in between the different exits in the sequence, which would drive capital away from vulnerable countries. This would lead to damaging instability more broadly. This is a scenario to fear and avoid, as we outlined already in Chapter 7.

Capital flight as well as the direct spill-over effects around a single exit, such as Greece, can be managed. It is the signalling effect from a Greek exit, which is the problem. It may be near-impossible to manage capital flight if a Greek exit opens the door to sequential exits (at least without giving up on free capital mobility). In fact, the instability of capital flows in that scenario, may lead to such severe economic damage that it would risk political disarray and a possible full-blown break-up.

Concluding remarks on the controversial topic of capital flight

In connection with the debate about a Eurozone break-up, it is common to argue that the costs associated with a break-up would be enormous, due to extreme capital flight (Eichengreen 2009). In fact, this is often used as an argument that break-up should be avoided at any cost. This argument, however, relies on a misunderstanding about the nature of capital flight.

In reality capital flight is a continuous process, and we have already seen extreme capital flight in some countries well ahead of a break-up. From this perspective, it is not clear that the break-up itself would necessarily generate a significant acceleration in capital flight, although a mismanaged break-up process surely could.

The real problem is sustained uncertainty, rather than the actual break-up as such. One could even argue that break-up will allow uncertainty to subside, as prices are allowed to adjust towards a form of equilibrium[25], but that goes beyond the main argument we are making here.

The ultimate solution lies in achieving optimal reconfiguration and a new equilibrium where private sector capital flows are in balance. The experience with Eurozone capital flows over the last year clearly documents that capital flight problems cannot be solved by pretending that a break-up is not possible.

From this perspective, a process of sequential exits, which would involve elevated and prolonged uncertainty, is the worst case outcome—and would likely result in devastating capital flight. We strongly recommend that such a path is avoided. For the benefit of the citizens of the Eurozone, a break-up should happen in one step, not sequentially, to shorten the duration of uncertainty and to minimise transition cost.

[25] While a break-up may remove uncertainty about redenomination risk, it will potentially create new uncertainties, such as those relating to the future direction of macro policy, inflation risk, and more fundamentally, property rights. Hence, whether a break-up will help to reduce uncertainty will depend on perceived future policy uncertainty in the post-exit world. Most likely, a transition phase will be needed before uncertainty will truly subside.

Part IV: Conclusion

Chapter 10:
Key policy insights and proposals

In this chapter, we briefly highlight the key insights and proposals embedded in the previous nine chapters. We highlight seven specific main points, listed here for summary purposes. Additional elements of our analysis can be found in the main text, and further detail is presented in the appendices.

(1) **A limited break-up can be managed.** We have analysed various types of fall-out from single country exits as well as from exits by limited groups of countries. Our quantitative estimates suggest that the fall-out, in terms of financial losses for banks and sovereigns, can be managed in a scenario where 3-5 GIIPS countries exit the Eurozone. In addition, such a limited break-up would leave hope that a certain degree of European cooperation can be preserved following break-up. Managing a limited break-up will require a) that it is done simultaneously, not sequentially, b) that comprehensive contingency plans are formed in advance, and c) that remaining core Eurozone countries move clearly toward fiscal union.

(2) **Preparedness is key to minimising transition costs.** A risk management approach to planning for a break-up can be adopted, as long as the outcome is not predetermined. Provided that this is the case, policy steps can be taken openly, and economic agents will be allowed to respond accordingly. Key steps involve reducing uncertainty around redenomination risk and introducing hedging tools for intra-EMU FX exposure, as well as proactive moves to stabilise banks and sovereign bond markets. Such preparedness will allow expedient resolution and stabilisation immediately following exit.

(3) **Negative balance sheet effects need to be countered.** Currency depreciation impacts the economy through various channels, mainly trade effects and balance sheets effects. Balance sheets effects, ex post break-up, are likely to be very large for exiting Eurozone countries. This is a function of significant external liabilities which would stay denominated in Euros following exit. To secure growth following exit, balance sheet effects need to be countered through a) ex ante risk reduction, including hedging, b) ex post debt restructuring and relief, and c) the availability of special financing vehicles, perhaps through the EIB.

(4) **Capital flight should be confronted with bold policy steps.** Regrettably, capital flight is already a major problem in the Eurozone, and there is no easy way to stop it without restraining the free movement of capital. Capital flight ultimately can only be controlled by attacking the root cause of the underlying imbalances and the credibility deficits in back-stop infrastructures. Capital flight cannot be prevented by pretending that a break-up is not possible. To avoid a period of prolonged and destabilising capital flight, it is crucial that no sequential break-up process takes place. The break-up has to be a one-off event, which is combined with additional integration in the core.

(5) **A breakdown in European cooperation should be avoided,** even in a Eurozone break-up. While there is widespread disagreement about the costs and benefits of the EMU, there is a more general consensus that integration of goods, labour and financial markets within the EU have seen significant benefits for EU member countries. An optimal reconfiguration of the Eurozone should seek to maintain the most advantageous components of European cooperation more broadly. A disorderly Eurozone break-up process would risk reversing decades of more fundamental (non-monetary) integration gains.

(6) **A full blown break-up would involve large yet unquantifiable cost.** The extreme form of break-up, involving all countries moving to new national currencies, will be associated with a number of unquantifiable costs. These costs include those associated with redenomination disputes, global financial instability due to losses on unknown latent currency exposures, political instability potentially risking a break-down in European cooperation, and extreme intra-European currency volatility in a new world of flexible European currencies.

(7) **An ECU-2 mechanism is needed to avoid redenomination anarchy in a full-blown break-up.** As a last resort, an ECU-2 currency basket concept would help resolve redenomination uncertainty. This solution would only apply in the undesirable scenario of full-blown break-up, where the Euro ceases to exist. The ECU-2 concept should be introduced by means of an EU directive, and would provide a bridge between tens of trillions worth of foreign-law contracts denominated in Euros, and the new national currencies of Eurozone countries. The ECU-2 currency basket would be an accounting tool used uniformly to efficiently settle millions of individual payments on foreign-law Euro-denominated instruments. It would serve to avoid arbitrary court decisions dictating the means of payment on myriads of international law contracts.

Chapter 11:
Rethinking the European monetary union

The current path of the Eurozone appears to be a dead end. The austerity based crisis strategy has led to depressed growth in an increasing number of member countries. Banking sector tensions and sovereign debt concerns also continue to increase, putting further downward pressure on growth.

Private sector funding markets are increasingly dysfunctional, and we can observe funding difficulties for a large proportion of Eurozone banks, for peripheral Eurozone sovereigns, and also, from a balance of payments perspective, for specific Eurozone countries. Meanwhile, the official sector is increasingly filling the gap. Banks are kept afloat by ECB funding, sovereigns are kept from default through the EFSF, and balance of payments funding is being supplied through a build-up in central bank liabilities, so-called TARGET2 balances.

Capital flight has become more pronounced; foreign institutional investors are reducing exposure to Eurozone markets, Eurozone investors are adopting a stronger (country specific) home bias, and depositors in the periphery are starting to move to safer banks in the Eurozone's core and to safe havens outside the region. Accelerating capital flight reinforces growth problems in the most vulnerable Eurozone member countries; meanwhile, ever larger official sector exposures are accumulating publicly through loan facilities, and "behind the scenes" through an astonishing build-up in exposure on the ECB balance sheet. Counting all official sector exposures, the core's exposure to the periphery is set to reach 30% of GDP this year.

At the same time, political risk is accumulating at various levels. At the individual country level, political risk is rising in the form of revolt against austerity, as we have seen lately in Greece. This is a risk which is also surging in other countries with failing austerity programs. Meanwhile, rising resentment at bailouts in Northern Europe has seen extremist parties taking larger shares of the vote in France and Netherlands. Political risk is also mounting at the institutional level in the form of protest against increasing moral hazard and the undemocratic socialisation of potential future losses. The growing political tension at the institutional level has been illustrated by prominent recent resignations from the ECB's governing council.

European policymakers will have to make a historical decision very soon. The choice is relatively well-defined at this point. It is a choice between further integration (involving fiscal integration and regional backstops for banks) or a form of break-up. An amalgamation of strategies is also possible and may indeed be the most likely outcome. This would involve the possible exit of one country (or a defined group of countries) occurring in tandem with significant additional integration among the remaining Eurozone member countries. In the absence of significant steps towards further integration, including absence of further cohesion between the core countries, a full-blown break-up would seem the likely outcome.

Risks are rising and the path ahead is unpredictable, driven by binary political decision by officials, as well as by voter choices in elections and referenda. The stakes are high, and it is time to start contingency planning in earnest. The first steps toward contingency planning have been taken, after the Greek election made it evident that a break-up is a real and imminent risk. But much more holistic planning efforts are required, given the multitude of uncertainties ahead.

It is time to rethink the European monetary union; it is time to stop pretending that adopting the Euro is an irrevocable process, and it is time to forget about loss of political capital involved in changing strategy for the Eurozone. The leaders who will be remembered positively are those who make visionary decisions for the benefit of their citizens, not those who stick to the script.

Rethinking the European monetary union involves a reconsideration of the optimal reconfiguration, fully incorporating the special circumstances associated with the current crisis. It also involves holistic contingency planning, openly where possible, and secretly when necessary. Finally, it involves minimising tail-risk associated with a political breakdown in the Eurozone and the EU. Such a breakdown would have large costs, not only in the form of costs associated with the break-up itself, but also due to potential loss of decades of integration gains at the EU level.

Our analysis suggests that a limited break-up of the Eurozone involving 3-5 exiting countries can be managed. It is not going to be pain-free, but it can be done, if it is combined with the steps outlined in this paper – rapid moves towards additional integration in the remaining core countries as well as coordinated efforts to manage the transition proactively.

A limited break-up process would allow exiting countries to see a benefit through increased competitiveness, especially if combined with sound new monetary institutional frameworks and measures to reduce balance sheet effects for borrowers in exiting countries.

A limited break-up process can be managed in terms of bank losses, official sector losses, and other stresses in the core, if combined with additional ECB liquidity provisions and other measures to stabilise bank funding and sovereign finance. This type of break-up process can preserve the EU and avoid a complete breakdown in European cooperation. This would also circumvent a full-blown break-up of the EMU, which would require ECB dissolution, involve the Euro ceasing to exist, and expose the entire region to immense political risk.

The worst case outcomes are a full-blown break-up and a prolonged sequential break-up process. The full-blown break-up would involve severe costs with respect to redenomination itself, even if an ECU-2 mechanism is used to settle Euro contracts. A sequential break-up process, starting with Greece and moving on to other vulnerable countries, would cause escalating and devastating capital flight, deposit instability, and a further deepening of recession dynamics. In addition, it would exacerbate a build-up in exposures in the core, and could entail a risk of splintering from the core, with countries such as Germany and the Netherlands essentially refusing a further socialisation of losses at some point. Both of these worst-case scenarios would entail large long-term costs associated with financial disintegration, a risk of competitive devaluations, and a broader break-down in European cooperation, including reversal of trade integration.

A break-up must be accomplished all at once to avoid a prolonged period of destabilising capital flight. Given that capital flight has already been accelerating since the summer of 2011, such a break-up would need to happen urgently, if it cannot be avoided altogether through serious advances toward integration.

The reconfiguration of the Eurozone will be a historical decision. Taking the final step to achieve sustainable monetary and fiscal integration will not be easy, and requires overcoming both legal hurdles and political and cultural differences. Political leaders must take brave steps to overcome nationalism as a driving force in EU level decision making. Who will participate, and who will exit, will be a political decision that will depend both on all individual countries' willingness to give up sovereignty and on core countries' willingness to mutualise liabilities. It is time to rethink the European monetary union.

The crisis in the Eurozone started in 2008 and has been escalating ever since. A break-up is likely to be painful for many agents and will likely result in a disruptive transition period. Nevertheless, a limited break-up, involving further integration of the remaining core, could put an end to the crisis and set the stage for future stability, continued cooperation and prosperity.

Acknowledgements

As with many larger endeavours, ours starts with the contributions of others. And this one time we hope to thank them for the great efforts they have made from which we have benefitted.

We would like to start by thanking the Nomura Legal team, in particular Bruce Railton, who lined up meetings and calls with Charles Proctor and Bruce Tredgett amongst others, both of whose insights begot our initial enquiries. And we must thank the other members of the legal team, including Andrew MacLean, Stephen Hewett, Katy Roberts, Jamal Qaimmaqami and Nick Laver. Without their work and help, our understanding on how to classify obligations would be incomplete. From their explanations, it was evident those contracts which would redenominate, those which would not, and those whose fate was absolutely uncertain. The Legal team continues to be of help in all the ongoing contingency planning and in the continued elaboration on this central theme, moving us forward in terms of preparedness.

For showing us the importance of contingency planning we have to thank the FSA who apparently took our original paper from November 2011 as a cue and elaborated on it further, and then we must thank Nomura's response team led by our CRO Lewis O'Donald, and the team members, Patrick Howard, Huw Howell and others who saw it as important to involve us. Only then could we see the intricacies of awareness, measurement and mitigation of risk, and the operational and IT issues, each of which must be mastered before any firm could be said to be prepared for the practical issues associated with break-up. Only through preparedness could uncertainty be reduced and only through systemic preparedness could systemic uncertainty be reduced.

And we must thank Charles Lovett-Turner, from Nomura's trading unit in London, who was the first to broach the idea of an NDF contract on potential future national currencies for Eurozone countries. He saw the need to introduce a hedging instrument and convinced us and management that it was something that could be traded. And to Mark Stafford who ran with the documentation and roped in legal once again. Charles's initial idea has gone far and will go much further once it is much better accepted.

Finally we have to thank the research effort, in particular Charles St Arnaud, Elizabeth Zoidis, and Erin Winter who worked tirelessly compiling data, summarising exposures, and analysing output. They put in considerable effort in ensuring the original paper and all subsequent studies were successes. And, others on the research team including Dimitris Drakopoulos, Eleftherios Farmakis, Jens Sondergaard, Artis Frankovics, Guy Mandy, Jon Peace, Rohit Garg and David Mendez-Vives.

We must give special thanks to management at Nomura Securities, including Des Supple, who has given every encouragement and plenty of leeway to move forward with this challenging project.

Finally, we would like to thank Fauziah Ariff for her in depth knowledge of process management, presentations and diagrams, top-down skills and for her patience, guidance and wisdom in seeing the forest for the trees, and Anna Starikovsky for helping to improve the language and structure of the paper.

References

Accenture, “If a country leaves the Euro…”, December 2011. The Long Odds Whitepaper Series, Accenture.

Al-Najjar, Nabil and Jonathan Weinstein, “A Bayesian Model of Risk and Uncertainty”, December 2011. Preprint, Kellogg School of Management, Northwestern University.

Allayannis, George, Ugur Lel, and Darius P. Miller, “Corporate governance and the hedging premium around the world”, September 2011. Darden Business School Working Paper No. 3-1, Darden School of Business, University of Virginia.

Altafaj, Amadeu, “Brussels says there’s no way for Eurozone member to abandon common currency”, Eurotribune, 8 September 2011. Internet.

Athanassiou, Phoebus, “Withdrawal and Expulsion from the EU and EMU: Some Reflections”, December 2009. ECB Legal Working Paper No. 10, ECB.

Aussilloux, Vincent and Lionel Fontagne, “What Benefits from Completing the Single Market?”, December 2011. *La Lettre du CEPII*, CEPII.

Baig, Taimur and Ilan Goldfajn, “Monetary Policy in the Aftermath of Currency Crises: The Case of Asia”, December 1998. IMF.

Basili, Marcello, “Knightian Uncertainty in Financial Markets: An Assessment”, February 2000. Working Paper No. 28, Department of Political Economy, University of Sienna.

Bayoumi, Tamim and Barry Eichengreen, “Shocking Aspects of European Monetary Unification”, January 1992. NBER Working Paper No. 3949, NBER.

Bayoumi, Tamim, Richard Harmsen and Jarkko Turunen, “Eurozone Export Performance and Competitiveness”, June 2011. IMF Working Paper No. WP/11/140.

Bawlf, Patrick and Dominic O’Kane, “Global Guide to Corporate Bankruptcy”, July 2010. Fixed Income Research, Nomura Securities.

Bofinger, Peter, Lars P. Feld, Wolfgang Franz, Christoph M. Schmidt, and Beatrice Weder di Mauro, “A European Redemption Pact”, November 2011. Vox.

Boltho, Andrea and Barry Eichengreen, “The Economic Impact of European Integration”, May 2008. Discussion Paper No. 6820, Centre for Economic Policy Research.

Bordo, Michael D. and Lars Jonung, “The Future of EMU: What does the history of monetary union tell us?”, September 1999. NBER Working Paper 7365.

Bordo, Michael D., “The Euro needs a Fiscal Union: Some Lessons from History”, October 2010. Shadow Open Market Committee, Rutgers University.

Broll, Udo and Kit Wong,”Multinationals, Hedging, and Capital Structure under Exchange Rate Uncertainty”, January 2006. Open Economies Review, Vol. 17(1), pp.103-114.

Broll, Udo and Jack E. Wahl, “Mitigation of Foreign Direct Investment Risk and Hedging”, April 2010. *Frontiers in Finance and Economics*, Vol. 7, No. 1, pp. 21-33.

Buiter, Willem, “Can Central Banks Go Broke?”, May 2008. CEPR Policy Insight No. 24, European Institute, LSE, Universiteit van Amsterdam and CEPR.

Cavallo, Michele, Kate Kisselev, Fabrizio Perri, and Nouriel Roubini, “Exchange rate overshooting and the costs of floating”, May 2005. Federal Reserve Bank of San Francisco Working Paper.

Céspedes, Luis Felipe, “Financial Frictions and Real Devaluations”, 2005. Central Bank of Chile Working Paper No. 318.

Clifford Chance LLP, “The Eurozone Crisis and Derivatives”, January 2012. Briefing Note, Clifford Chance LLP.

Dalton, John W. and Claudia Helene Dziobek, “Central Bank Losses and Experiences in Selected Countries”, April 2005. IMF Working Paper WP/05/72, IMF.

Darvas, Zsolt, “Competitiveness adjustment in Euro-area periphery”, April 2012. Bruegel.

Davis, Kevin E, “The Concept of Legal Uncertainty: Definition and Measurement”, November 2011. Working Paper Series, New York University School of Law.

Dedek, Oldrich, “The Break-up of Czechoslovakia: An In-Depth Economic Analysis”, January 1996. University of California: Avebury, Print.

Dor, Eric, “Leaving the Eurozone: A User’s Guide”, October 2011. IESEG Working Paper No. 2011-ECO-06, IESEG School of Management, Lille Catholic University.

Dor, Eric, “The Cost of a Greek Euro Exit for Spain”, May 2012. IESEG School of Management, Lille Catholic University.

Duisenberg, Willem F., “The Past and Future of European Integration: A Central Banker’s Perspective”, 26 September 1999. IMF 1999 Per Jacobsson Lecture.

ECB, “Financial Integration in Europe”, April 2012. ECB.

Eichengreen, Barry, “The break-up of the Eurozone”, September 2007. NBER Working Paper No. 13391, NBER.

Eichengreen, Barry, “Was the Euro a mistake?”, January 2009. Vox.

Epstein, Larry G. and Tan Wang, “Intertemporal Asset Pricing under Knightian Uncertainty”, March 1994. *Econometrica* Vol 62, No 3, pp. 283-322.

European Commission, “European Competitiveness Report 2011”, 2011. Commission staff working document SEC(2011) 1188, European Commission.

Firoozye, Nick and Jens Sondergaard, “EFSF Leverage”, November 2011. EMEA Rates Strategy, Nomura Securities.

Frankel, Jeffrey and Rose, Andrew, “Is EMU more justifiable ex post than ex ante?”, May 1997. European Economic Review, Volume 41, Issues 3-5, pp. 753-760.

Frankel, Jeffrey A., “Contractionary Currency Crashes in Developing Countries”, November 2004. The 5th Mundell-Fleming Lecture, IMF Annual Research Conference.

Goldstein, Morris and Philip Turner, “Controlling Currency Mismatches in Emerging Markets,” April 2004. Peterson Institute for International Economics.

Halac, Marina, Sergio L. Schmukler, Eduardo Fernández, and Ugo Panizza, “Distributional Effects of Crises: The Financial Channel,” Fall 2004. Economía Vol. 5, No.1.

IMF, Euro Crisis Seminar (Transcript), 20 April 2012.

“Interest Rate Trade Repository Report”, TriOptima, April 2012.

Krugman, Paul, “Lessons of Massachusetts for EMU”, 1993. *Adjustment for Growth in the European Monetary Union*, New York: Cambridge University Press, pp. 241-261.

Lane, Philip and Jay Shambaugh, “Financial Exchange Rates and International Currency Exposures”, September 2007. IIIS Discussion Paper No. 229, III.

Laver, Nick, Personal correspondence, March 2012.

Nitsch, Volker, “Have a Break, Have a… National Currency: When Do Monetary Unions Fall Apart?”, January 2004. CESIFO Working Paper No. 1113.

Nordvig, Jens, Charles St-Arnauld, and Nick Firoozye, “Currency risk in a Eurozone break-up – Legal Aspects”, November 2011. Fixed Income Strategy Special Topic, Nomura Securities.

Nordvig, Jens, “Currency risk in a Eurozone break-up: Valuing potential new national currencies”, December 2011. Nomura Securities Fixed Income Strategy.

Nordvig, Jens, “Currency Risk in the Eurozone: Accounting for break-up and redenomination risk”, January 2012(a). Nomura FX Strategy, Nomura Securities.

Nordvig, Jens, “Preparing for a Greek Eurozone Exit: Part II”, May 2012(b). Nomura FX Strategy, Nomura Securities.

Nordvig, Jens, “Preparing for a Greek Eurozone Exit: Part III”, May 2012(c). Nomura FX Strategy, Nomura Securities.

Nordvig, Jens, Ylva Cederholm, and Yujiro Goto, “Eurozone March capital flows”, May 2012. Nomura FX Strategy, Nomura Securities.

Pastor, Lubos and Pietro Veronesi, “Political Uncertainty and Risk Premia”, September 2011. NBER Working Paper Series No. 17464.

Wong, Kit Pong, “Foreign Direct Investment and Currency Hedging”, December 2007. HIEBS Working papers, University of Hong Kong, Preprint.

Proctor, Charles, Mann on the Legal *Aspect of Money*, 2005. Oxford University Press, 6th Edition.

Proctor, Charles, “The Greek Crisis and the Euro – A Tipping Point?”, June 2011. Client Advisory, Edwards Angell Palmer & Dodge.

Proctor, Charles, “The Euro- fragmentation and the financial markets”, October 2010. *Capital Markets Law Journal* (2011).

Proctor, Charles, Personal correspondence, November 2011 and May 2012.

Rhodes, David and Daniel Stelter, “What Next? Where Next? What to Expect and How to Prepare”, January 2012. *Collateral Damage.*

Rose, Andrew. “Checking Out: Exits from Currency Unions”, December 2006. Haas School of Business (Draft), University of California, Berkley.

Scott, Hal S., “When the Euro Falls Apart”, 1998. Working paper, Program on International Financial Systems, Harvard Law School.

Scott, Hal S., “When the Euro Falls Apart – A Sequel”, January 2011. Working paper, Program on International Financial Systems, Harvard Law School.

Sinn, Hans-Werner and Timo Wollmershaeuser, “Target Loans, Current Account Balances and Capital Flows: The ECB’s Rescue Facility,” November 2011. NBER Working Paper No. 17626.

Slaughter and May LLP, “Euro break-up/fragmentation: Impact on financial documentation”, December 2011. Slaughter and May LLP.

Takagi, Shinji, Mototsugu Shintani, and Tetsuro Okamoto, “Measuring the Economic Impact of Monetary Union: The Case of Okinawa”, July 2003. Vanderbilt University Working Paper No. 03-W15.

Tett, Gillian, “Banks bet on a fractured Europe”, 25 May 2012. The Financial Times. Print.

Trichet, Jean-Claude, “Address at the ceremony to mark the 10th anniversary of the European Central Bank and the European System of Central Banks”, June 2008, ECB.

Towbin, Pascal and Sebastian Weber, “Limits of Floating Exchange Rates: the Role of Foreign Currency Debt and Import Structure”, February 2011. IMF Working Paper 11/42.

Weiss, Uri, “The Regressive Effect of Legal Uncertainty”, 2005. Faculty Paper 30, Tel Aviv University Law School.