ANCHOR REPORT

NOMURA

FOREIGN EXCHANGE RESEARCH AND STRATEGY

Currency Risk in the Eurozone: Accounting for break-up and redenomination risk

- **The risk of a eurozone break-up has risen significantly as the debt crisis has spread to larger eurozone countries.**
- **Investors should re-assess currency risk in the eurozone, including redenomination risk associated with a break-up.**
- **Key parameters include legal jurisdiction of assets and obligations, depreciation risk at the country level and the nature and sequencing of the break-up process.**

January 2012

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Executive Summary

- A break-up of the eurozone is not our central case. But the risk has risen significantly in 2011 as the debt crisis has spread to some of the biggest sovereign debt markets, including Italy. If European policymakers fail to calm tensions in coming months so that government bond yields stay at unsustainably high levels, break-up risk will rise further and could eventually become the central case.
- Two types of break-up are possible: a very limited break-up, involving one or a few small countries; and a full-blown 'big bang' break-up, which would see the Euro cease to exist. We don't think a sequential 'onion peeling type break-up process can run very far; the exit and default of a large eurozone country would likely trigger a collapse in core eurozone banking systems and lead to a big bang collapse of the entire eurozone.
- Investors should pay increasing attention to redenomination risk of eurozone assets. A eurozone break-up is likely to see redenomination of assets and obligations into new national currencies or a new European Currency Unit (ECU-2). Redenomination risk depends crucially on the legal jurisdiction of the obligation in question. Local law obligations are generally likely to be redenominated into the new local currency in a break-up scenario. But foreign law obligation may be harder to redenominate.
- Most sovereign debt is issued under local law, especially in the larger eurozone countries. But a large part of corporate and bank debt is issued under foreign law, typically English or New York law. Debt issued under foreign law should generally trade at a premium to local law debt, given the lower redenomination risk.
- We have constructed fair value estimates for new national currencies, based on current real exchange rate misalignments and future inflation risk. Our estimates suggest significant depreciation risk for a number of eurozone countries in a redenomination scenario. We estimate that this risk is in the region 60% for Greece, around 50% for Portugal, and 25-35% for a group of countries including Ireland, Italy, Belgium and Spain. At the same time, our estimates confirm the common perception that a new German currency will fare better.
- There are many examples of obligations and contracts where there is no clear nexus to a specific eurozone country and where redenomination into new national currencies would be highly problematic. From this perspective, a new European Currency Unit (ECU-2) could play an important role in facilitating an orderly redenomination process for the myriad contracts and obligations.
- The future value of the ECU-2 would depend on the weights of its individual component parts and the trajectory of new national currencies from the point of the break-up. Our initial estimates suggest a long-term fair value for the new ECU versus USD of around 1.15. This estimate embeds uncertainty both about the potential valuation of the component currencies and about the weights in the basket; and initial trading would likely see substantial deviation from long-term fair-value.
- A number of trades could benefit and serve as hedges in a break-up scenario. We like long German treasury bills, long German treasury bills on repo, and long (local law) KFW. We also like to be short EFSF bonds and short local law bonds versus foreign law bonds in high quality (non-German) names, although liquidity is an issue.
- Finally, short EUR positions versus other major currencies (USD, JPY and CNY) should perform well on a path towards a eurozone break-up.

Possible break-up scenarios

A break-up of the eurozone is not our central case, but we do see it as a real risk. In order to evaluate appropriate risk premia on eurozone assets, it is important to pinpoint which types of break-up scenarios are feasible. Two types of break-up scenarios are possible, in our view: A very limited break-up scenario and 'big bang' break-up scenario. A sequential 'onion peeling' type of break-up process, which would see only stronger core countries remain in the eurozone, is highly unlikely in our view. Once you discount the probability of an 'onion peeling' type of break-up process, the tail risks for eurozone assets in a break-up are highly asymmetric, and clearly skewed to the downside.

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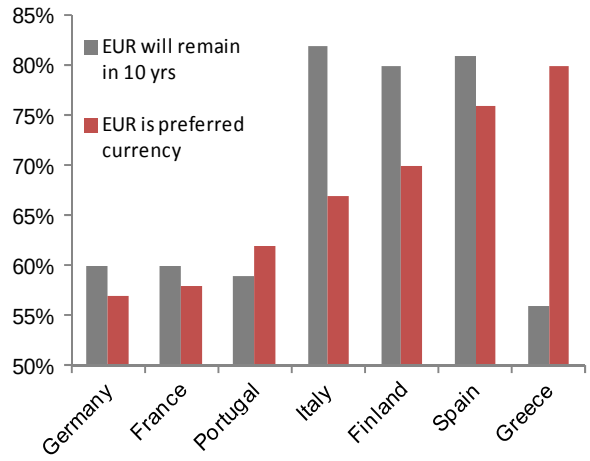
We see a real risk of break-up

The treaties of the European Union, which also define the rules of the monetary union, do not contain any specific procedure for a eurozone breakup. When the euro was created, policymakers wanted euro adoption to be irrevocable, and they did not want to spell out a route to exit.

But the eurozone debt crisis has changed matters. The turmoil around the suggested Greek referendum on the bailout package in November illustrated that a break-up is no longer inconceivable. Following then-Prime Minister Papandreou's proposal for a referendum, key European policymakers, including French President Sarkozy and euro-group head Juncker, talked openly about a potential Greek exit from the eurozone.

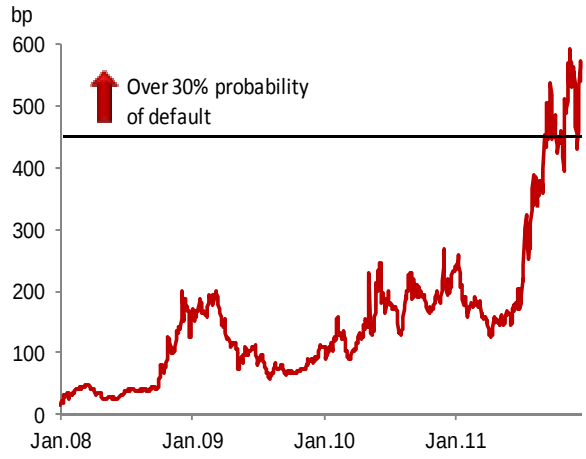
European policymakers continue to argue that they will do 'what is needed' to save the euro. But the genie is out of the bottle, and various break-up scenarios are now being discussed more openly. In December, new ECB President Draghi even commented on the consequences of a break-up in a Financial Times interview.

Fig. 1: Opinion poll measuring support for the euro



Note: Grey bars represent respondents who answered "Yes" to the question, "Do you think the euro will remain your nation's currency in 10 years?" Red bars represent respondents who answered "Yes" to the question, "Do you prefer the euro to your past national currency?" *Source: Nomura, Wall Street Journal*

Fig. 2: Italian CDS and default probability



Source: Nomura, Bloomberg

In this context, a key question is what form a potential break-up the eurozone could take. There are various theoretical possibilities: a one-off departure of a single country, such as Greece; a sequential process, where weaker peripheral countries gradually peel off, like layers of an onion; and a 'big bang' break-up, where the eurozone collapses in one go and the euro ceases to exist.

Distinguishing which of these break-up scenarios is possible (even if the probability is relatively low) and which is highly improbable (close to zero probability) is important. It will influence how various eurozone assets trade and the euro's behavior during the transition process to the final outcome. We think only two main types of break-up scenarios (the very limited break-up and the 'big bang' break-up) are realistically possible. Meanwhile, a sequential and prolonged break-up process, which resembles peeling an onion, is highly unlikely in our view.

A very limited eurozone break-up: possible

A very limited break-up involving one or a few smaller peripheral countries is a possibility, in our view. This scenario could happen in the face of a political setback in Greece and/or Portugal, which would translate into unwillingness to satisfy EU demands and the break-down of bailout programs (see Nomura Europe Special Report: Event risk in Greece – December 1, 2011).

A break-up is unlikely to happen by explicit choice, given the very large economic cost involved and the very significant political capital already invested. Moreover, opinion polls suggest that support for the euro remains relatively high in the periphery (see Figure 1). But that does not mean that a break-up is impossible. The turmoil around the suggested Greek referendum in November illustrates how a 'political accident' can suddenly put a break-up on the agenda. More recently, the possibility of an Irish referendum has become a real risk. Irish Finance Minister Noonan declared before Christmas that a referendum for an EU treaty change would be a referendum for euro membership, highlighting once again how political developments can serve as catalysts for a break-up.

A big-bang eurozone break-up: possible

A big bang break-up could result from a default in a major eurozone country, such as Italy. Such a scenario would render the bulk of eurozone banks insolvent and leave the ECB incapable of providing liquidity to banks in an orderly fashion. Hence, this scenario would likely involve a full-blown collapse of the eurozone.

The consensus among institutional investors we speak to is that this is a very low probability scenario. But this view does not seem to be fully consistent with the default risk implied by Italian sovereign bonds and CDS contracts. The current spread of 575bp on the 5yr CDS contract can be translated into implied default probability of 30-40% (over a five-year period), depending on the assumed recovery rate (see Figure 2). The market is pricing an Italian default not as the central case, but as a very significant tail risk, and it is doubtful whether the eurozone monetary system can withstand an Italian default.

Moreover, accidents can happen in terms of economic and market developments too. Recent deposit and capital flow dynamics in the eurozone suggest that destabilizing cross-border capital flows are starting to take place.

A further deterioration in these dynamics could destabilize the banking system to a degree where concerns about a break-up could start to have a self-fulfilling element. This is especially the case if capital flows start to leak out of the eurozone, mirroring the type of capital flight dynamics typically seen in emerging market currency crises.

A sequential 'onion peeling' break-up process: highly unlikely

We think a sequential break-up where the eurozone over time is reduced to a core of strong eurozone countries is highly unlikely to be feasible in practice. This is at least the conclusion if the time frame is just a few years. Such an 'onion peeling process', during which weaker eurozone countries gradually exit, is likely to come to a halt when the process reaches one of the larger eurozone countries, such as Italy or Spain. At this point, we think the process would likely become uncontrollable and lead to a big bang collapse, including the core countries.

There are three main reasons why we think an Italian exit and default scenario is unlikely to be manageable and would translate into a big bang collapse of the eurozone:

First, Italy is a part of Europe's core: Italy was one of only six founding members of the EU more than 50 years ago. In fact, the founding treaty of the EU was signed in Rome in 1957. It is no coincidence that the ECB president is an Italian and that the previous ECB presidents were also from original founding member countries (Duisenberg from the Netherlands, Trichet from France). There may have been some doubt about Italy's position and role under Prime Minister Berlusconi. But after his resignation, Germany and France have strongly endorsed Mario Monti's technocratic government and Italy is clearly back in the core.

Second, an Italian default and exit would likely bring down large parts of the eurozone banking system: An exit by Greece or Portugal may be manageable given that those countries are small, and given that preparations for potential debt restructuring have already been under way for some time. But an Italian default and eurozone exit is a completely different matter.

The size of Italy's debt burden has precluded an official sector backstop up to this point, and debt restructuring may indeed be too much for the French banking system to handle. Figure 3 shows the exposures of French banks to Italian assets, and Box 1 contains some illustrative calculations of potential losses for French banks. The losses for French banks in a situation of Italian exit/restructuring could generate losses in excess of 20% of French GDP.

Given that the French debt to GDP ratio is already set to reach around 90% during 2012, this additional contingent liability could see the debt to GDP ratio jump tonear 120%, similar to the level in Italy currently. In addition, the jump would be even bigger if it happens in the face of declining French GDP.

Hence, an Italian default and exit scenario would likely make core eurozone banking systems so unstable that capital controls would be a distinct possibility, at which point the euro project would be obsolete.

Fig. 3: French exposure to eurozone periphery countries

French exposure to eurozone periphery ($ bn)						
Type of Exposure	Greece	Ireland	Portugal	Spain	Italy	Total
Public sector	10.7	2.9	6.2	30.5	106.8	157.0
Banks	1.6	9.8	6.2	38.6	44.7	100.9
Non-bank private	43.5	19.3	13.3	81.8	265.0	422.8
Total	55.7	32.0	25.7	150.9	416.4	680.7

Note: See Box 2 for further detail on exposure to eurozone periphery. Source: Nomura, BIS

Box 1: Bank losses in sovereign default scenarios

		Losses ($bn) resulting from default in:			
	Type of Exposure	Spain	Italy	GR, IE, PT	Total
Germany	Sovereign	17.7	28.6	14.9	61.2
	Banks	27.7	19.3	14.4	61.4
	Other	15.8	13.2	21.4	50.3
	Total	61.1	61.1	50.7	172.8
Spain	Sovereign	0.0	6.7	4.7	11.4
	Banks	0.0	1.7	2.5	4.2
	Other	0.0	4.9	17.0	21.8
	Total	0.0	13.3	24.1	37.4
France	Sovereign	18.3	64.1	11.8	94.2
	Banks	15.4	17.9	7.0	40.3
	Other	16.4	53.0	15.2	84.6
	Total	50.1	134.9	34.1	219.1
Italy	Sovereign	3.8	0.0	1.8	5.6
	Banks	2.7	0.0	2.6	5.3
	Other	3.4	0.0	2.6	6.0
	Total	9.9	0.0	7.0	16.9
Other EMU	Sovereign	9.8	30.3	39.3	79.4
	Banks	21.3	15.4	9.0	45.7
	Other	21.6	7.5	16.3	45.4
	Total	52.7	53.2	64.6	170.5
UK	Sovereign	4.6	10.5	5.3	20.3
	Banks	7.2	3.6	8.8	19.5
	Other	15.1	9.5	29.6	54.2
	Total	26.8	23.5	43.7	94.0
Japan	Sovereign	6.5	18.5	1.3	26.4
	Banks	2.0	1.7	1.0	4.7
	Other	2.2	1.8	3.9	7.9
	Total	10.7	22.1	6.3	39.0
US	Sovereign	4.6	7.7	3.2	15.5
	Banks	11.4	7.6	6.6	25.6
	Other	6.2	3.0	9.1	18.2
	Total	22.1	18.4	18.9	59.3
ROW	Sovereign	0.3	0.3	0.7	1.4
	Banks	0.5	0.5	1.0	1.9
	Other	0.4	0.4	1.0	1.8
	Total	1.3	1.3	2.6	5.1
Total	Sovereign	65.6	166.7	83.0	315.3
	Banks	88.0	67.7	52.9	208.6
	Other	81.0	93.2	116.1	290.2
	Total	234.6	327.6	251.9	814.2
Total EMU	Sovereign	49.6	129.6	72.5	251.7
	Banks	67.1	54.3	35.5	156.9
	Other	57.1	78.5	72.5	208.1
	Total	173.8	262.4	180.5	616.7

Note: "Periphery countries' total losses" are the sum of bank losses in Greece, Ireland, Portugal, Italy, and Spain. *Source: Nomura, BIS*

Our calculations of the losses are based on the cross-border exposure calculated by the BIS as of the second quarter of 2011. We conduct scenario analysis of direct and indirect bank losses in a 'realistic restructuring scenario', incorporating additional defaults in banking and non-financial sectors as a function of sovereign debt restructuring. Our main assumptions are:

1. The sovereign will restructure its debt with a recovery rate of 60%.
2. As a result of the losses on their holdings of sovereign debt, the local peripheral banks will also be forced to also restructure their debt, but with a lower recovery rate of only 40%.
3. The restructuring of the banking sector also leads to restructuring/defaults of some non-bank debt. Here, we assume that about 50% of non-bank debt needs to be restructured with a recovery rate of 40%.

These figures are for illustrative purposes only, and the actual haircuts could end up being substantially larger.

Third, European policymakers have already articulated that an Italian default would spell the end of the European Monetary Union: When Chancellor Merkel and President Sarkozy meet with Mario Monti at the end of November, Mr Monti's office released a statement saying that Ms Merkel and Mr Sarkozy were aware that the collapse of Italy would inevitably be the end of the euro. As such, policymakers already recognize that failure to limit contagion to Italy would likely lead to a breakdown of the monetary union altogether.

We therefore believe that even if a break-up begins to unfold in an 'onion peeling' fashion, it will eventually spin out of control and turn into a 'big bang' break-up of the eurozone.

Q2 2011	Exposures ($bn) to:						
	Type of Exposure	Greece	Ireland	Portugal	Spain	Italy	Total
Germany	Public sector	12.4	3.5	9.0	29.5	47.6	101.9
	Banks	1.8	21.5	12.6	69.1	48.3	153.4
	Non-bank private	7.1	85.5	14.3	78.9	65.8	251.6
	Total	21.4	110.5	35.9	177.5	161.8	507.0
Spain	Public sector	0.5	0.2	7.1	0.0	11.2	18.9
	Banks	0.0	1.2	5.1	0.0	4.2	10.5
	Non-bank private	0.7	7.9	76.3	0.0	24.4	109.2
	Total	1.2	9.2	88.5	0.0	39.8	138.6
France	Public sector	10.7	2.9	6.2	30.5	106.8	157.0
	Banks	1.6	9.8	6.2	38.6	44.7	100.9
	Non-bank private	43.5	19.3	13.3	81.8	265.0	422.8
	Total	55.7	32.0	25.7	150.9	416.4	680.7
Italy	Public sector	1.9	0.6	0.5	6.4	0.0	9.4
	Banks	0.2	4.4	1.9	6.7	0.0	13.2
	Non-bank private	1.7	9.9	1.6	16.9	0.0	29.9
	Total	3.7	14.8	3.9	30.0		52.5
Other Eurozone	Public sector	7.9	52.4	5.3	16.3	50.5	132.4
	Banks	2.0	9.4	11.2	53.2	38.5	114.2
	Non-bank private	16.1	59.4	5.8	108.2	37.5	227.0
	Total	26.1	121.2	22.2	177.6	126.5	473.6
Great Britain	Public sector	3.3	3.7	1.9	7.6	17.4	33.9
	Banks	1.1	16.9	4.0	18.0	8.9	48.8
	Non-bank private	8.3	120.3	19.6	75.3	47.4	270.9
	Total	12.6	140.8	25.4	100.9	73.7	353.5
Japan	Public sector	0.1	1.0	1.1	10.9	30.9	43.9
	Banks	0.4	1.9	0.3	4.9	4.3	11.8
	Non-bank private	0.8	17.9	0.9	11.1	9.0	39.7
	Total	1.4	20.8	2.2	26.9	44.2	95.5
US	Public sector	2.3	1.9	1.1	7.6	12.9	25.9
	Banks	2.5	11.7	2.3	28.4	19.1	64.0
	Non-bank private	3.5	40.0	1.9	30.8	14.9	91.0
	Total	8.4	53.6	5.3	66.8	46.9	180.9
ROW	Public sector	0.0	0.6	0.6	0.6	0.6	2.3
	Banks	0.1	1.2	1.2	1.2	1.2	4.9
	Non-bank private	0.5	2.1	2.1	2.1	2.1	9.0
	Total	0.6	3.9	3.9	3.9	3.9	16.2

Legal aspects of redenomination

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As we have discussed in the previous chapter, eurozone break-up risk has risen notably over the past few months as European policy makers have failed to put in place a credible backstop for the larger eurozone bond markets. Given this increased risk, investors should pay close attention to the 'redenomination risk' of various assets. There are important legal dimensions to this risk, including legal jurisdiction of the obligation in question. Risk premia on eurozone assets are likely to be increasingly determined by this 'redenomination risk'. In a full-blown break-up scenario, the redenomination risk may depend crucially on whether the process is multilaterally agreed upon *and on whether a new European Currency Unit (ECU-2) is introduced to settle existing EUR contracts.*

Redenomination risk: Which Euros will stay Euros?

Countries do change their currency from time to time. Argentina moved away from an effectively dollar-based economy in 2002, towards a flexible peso based currency system. Similarly, currency unions have seen break-downs in the past. The break-up of the Czechoslovakian currency union in 1993 and the break-up of the Rouble currency area between 1992 and 1995 are key examples from the relatively recent history.

In the context of the eurozone, the issue of redenomination is complex because there is no well-defined legal path towards eurozone and EU exit (and some debate about the specifics of Article 50 of the Treaty on the Functioning of the European Union (TFEU) and the immediacy of its applicability[1]). However, the recent political reality has demonstrated that the lack of legal framework for an exit/break-up is unlikely to preclude the possibility. Moreover, during its recent national congress the German CDU party approved a resolution that would allow euro states to quit the monetary union without having to also exit the EU. We note that this decision would need to be approved by the national parliament before having any legal power. Nevertheless, it shows the direction in which politics are moving.

Since the risk of some form of break-up is now material, investors should be thinking about "redenomination risk[2]": Which Euro denominated assets (and liabilities) will stay in Euro, and which will potentially be redenominated into new local currencies in a break-up scenario?

The importance of legal jurisdiction

There are a number of important parameters, which from a legal perspective should determine the risk of redenomination of financial instruments (bonds, loans, etc).

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

- 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 some form of currency law).

[1] See P Athanasiou, Withdrawal and expulsion from the EU and EMU: Some reflections, ECB Legal Working paper series no 10, Dec 2009, (see link), although we note that the Commission has specifically said exit was not possible.
[2] See, e.g., Eric Dor, Leaving the Euro zone: a user's guide, IESEG School of Management working paper series, 2011-ECO-06, Oct 2011, link. 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.

- If the obligation is governed by foreign law, then the country which is exiting the eurozone cannot by its domestic statute change a foreign law. If the currency is not explicit to the foreign contract, then it may be up to the courts to determine the implicit nexus of contract.

Applying this principle to a scenario of Greek exit from the Eurozone, it implies that Greek government bonds issued under Greek law (which account for 94% of the outstanding debt), can be redenominated into a new Greek drachma. However, Greek Eurobonds, (which are issued under English law) or their USD-denominated bonds (under NY Law), would not easily be redenominated into a new local currency, and may indeed stay denominated in Euros.

The second legal parameter to consider is the *method* for breakup. Is the method a legal or multilateral framework or is it done illegally and unilaterally? The method for breakup has vastly different consequences for the international recognition.

Lawful and Consensual Withdrawal. There is debate about legal methods for exiting the Euro but there is some consensus around the use of Article 50 in the Lisbon Treaty. There may be other methods for "opting out" in the use of Vienna convention on the Law of Treaties[3] if there is no agreement on the usage of Article 50, then this would accord more international jurisprudential acceptance.

Unlawful and Unilateral Withdrawal. Treaties are merely contracts between sovereign nations and can be broken under some circumstances, and it may prove far more expedient to undergo a unilateral withdrawal rather than to wait for the vast array of agreements needed for consensual withdrawal. Similarly, expulsion could also be unlawful in theory.

The third 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 smaller eurozone countries*. In this scenario, the Euro will likely remain in existence. This scenario materializes if a few smaller countries, such as Greece and perhaps Portugal, end up exiting and adopt their own new national currencies.
- *Full-blown break-up*: In this scenario, perhaps precipitated by an Italian default, 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.

This leaves four basic scenarios to consider, depending on whether obligations in question are issued under local or foreign jurisdiction and depending on the nature of the break-up.

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

For obligations issued under *foreign law*, the situation is more complex. We will go into detail later. But before we do that, it is helpful to highlight the big picture:

- **Unilateral withdrawal** and no multilaterally agreed framework for exit, foreign law contracts are highly likely to remain denominated in Euro. 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 so-called *Lex-Monetae* principle, if the specific contracts in question have a very clear link to the exiting country, or if there is an EU directive specifying certain agreed criteria for redenomination. However, the large majority of contracts and obligations are likely to stay denominated in Euro.
- **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 two basic solutions. Either obligations are redenominated into new national currencies by application of the *Lex Monetae* principle or there is significant rationale of the legal basis for the argument of *Impracticability* or *Commercial Impossibility*[3]. Alternatively, 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.

Fig. 4: Redenomination risk on eurozone assets

	Small Break-Up scenario: EUR remains the currency of core Eurozone countries		Full-blown Break-up Scenario: Euro ceases to exist
	Unilateral withdrawal	**Multilaterally agreed exit**	
Securities/Loans etc governed by international law	**No redenomination: EUR remains the currency of payment** (except in cases of insolvency where local coart may decide awards)	**No general redenomination: EUR remains currency of payment**, although certain EUR contracts/obligations could be redenominated using lex monetae principle (if there are special attributes of contracts) and/or an EU directive setting criteria for redenomination	***Redenomination*** *happens either to new local currencies by applying lex monetae principle or by converting contacts/obligations to ECU-2*
Securities/Loans etc governed by local law	***Redenomination to new local currency*** *(through* change in local currency law, unless not in the interest of the specific sovereign)		

Source: Nomura

[3] The more common *Frustration of Contract* is unlikely to apply, see Procter, Euro-Fragmentation.

The need for an ECU-2 and EU directives in a break-up

There are a number of practical difficulties associated with creating a new European Currency Unit (ECU-2) to provide a means of payment on EUR denominated contracts and obligations. We will address those issues in detail in the chapter entitled “Do you remember the ECU?”. For now, we simply want to highlight the introduction of the ECU-2 as a potential option for settling payment on EUR obligations and contracts in the full-blown break-up scenario. Without some overriding statutory prescription, the Courts are left having to decide the currency of each contract. While this has certain advantages given the overall flexibility of the Lex Monetae principle (see *Box 3: Lex Monetae)* for attempting inference as to the originally intended (and likely more equitable) currency of the contract, in the event of complete split-up, it is likely that a great many ambiguous cases result in arbitrary awards. For example, if English courts decided on redenomination into British pounds, as some case laws suggest could be the case (as highlighted by Charles Proctor), clearly the redenomination process would involve currency risk that would seem rather arbitrary, and would depend crucially on conversion rates decided upon by courts, most likely some last official EUR-GBP exchange rate before trading halted.

Box 3: Lex Monetae

Lex Monetae or “the law of money” is a well determined principle with a great deal of case law. It is generally established that sovereign nations have the internationally recognised right to determine their legal currency. Reliance on this principal was actually key to the establishment of the EUR itself (see W Duisenberg, The Past and Future of European Integration: A Central Banker s Perspective, IMF 1999 Per Jacobsson Lecture, see link).

For a brief overview of the principle, see C Proctor, The Euro-fragmentation and the financial markets, Cap Markets Law J (2011) 6(1) (see link) or The Greek Crisis and the Euro – A Tipping Point, June 2011 (see link) and for a more in-depth exposition as well as the history of case law, C Proctor, Mann on the Legal Aspect of Money, 6th Ed, Oxford UP, 2005 (see link).

When thinking about the likely redenomination process, the following parameters are likely to be crucial in order to establish the legal territorial nexus of contract/obligation:

1. Explicit Nexus of contract can be established via a (re)denomination clause: The EUR or in any event the legal currency of <Exiting Country> from time to time.
2. Implicit Nexus of contract if
    a. Contract is governed by the Laws of <Exiting Country>
    b. Location of Obligor (debtor) is <Exiting Country>
    c. Location which action must be undertaken (e.g., place of payment) is <Exiting Country>
    d. Place of payment is <Exiting Country>

If no denomination clause exists, it is up to the courts to determine the Implicit Nexus of the contract. Was EUR meant to be EUR or the currency of the <Exiting Country>? If all of the factors mentioned tie the contract to the <Exiting country>, there is a rebuttable presumption that the parties to the contract had intended to contract on the currency of the <Exiting Country>. If one or more of the implicit tests fails, it is highly likely that there is insufficient evidence to determine the link to the <Exiting Country> and the contract or obligation is likely to kept in EUR. We expect that under this principle, the vast majority of English Law contracts originally denominated in EUR will remain in EUR (if it exists).

The advantage of applying an ECU-2 based redenomination is that it removes this uncertainty over obligations that would otherwise be difficult to re-denominate into national currencies. For example, how should a EUR denominated loan extended by a UK bank to a Polish corporation be handled after a eurozone break-up? An ECU-2, which is linked to the new national currencies according to a weighting scheme, could help ensure an orderly handling of situations, where there is no clear way to redenominate an obligation. By issuing an EU directive, English courts would be instructed to interpret EUR in any contract to mean ECU-2 thereafter.

We note that the Euro itself was created by the process of EU directives as well as passage of legislation in NY, Tokyo and other localities (while some were determined to need no further statutes)[4]. These statutes were passed to ensure continuity of the contract and in order to do so, they specifically stated that frustrations that force major clauses, redenomination clauses or the possibility of claiming material adverse change would all be overruled. In order to ensure a timelier and more certain outcome (although we can certainly not claim it to be more just), an EU directive could compel UK courts to re-denominate contracts into some official new currency such as the ECU-2, at a specific rate.

Risk premia and legal jurisdiction

The overall conclusion from our perspective is that the risk of redenomination of EUR obligations into new local currency is higher for local law obligations than for obligations issued under foreign law.

This distinction is especially relevant in scenarios where the break-up is limited, and where the EUR remains a functioning currency. In the alternative scenario of a full-blown break-up, redenomination into new local currency or ECU-2 is possible even for foreign law bonds, and there is a less clear-cut case for differing risk premia based on different jurisdictions.

In any case, the immediate conclusion from an investor perspective should be that assets issued under local law should trade at a discount to foreign law obligations, given the greater redenomination risk for local law instruments. This conclusion is based on the implicit assumption that a new national currency would trade at a discount to the Euro. Obviously the validity of this assumption will depend on the specific country in question, but most would agree that this assumption is likely to be correct for countries such as Greece, Portugal, Ireland, Spain and Italy, and our analysis in the chapter on “Valuing new national currencies” substantiates this. The caveat to this argument is that insolvency may alter the conclusion. In the case of insolvency, foreign law obligations may remain denominated in Euro (in a limited break-up scenario). But there could still be a material hair-cut on foreign law obligations. Hence, in an insolvency, whether local law obligations should trade at a discount to similar foreign law obligations will then depend on an evaluation of the higher redenomination risk relative to the size of likely haircuts on local law vs foreign bonds. If hair-cuts on foreign law bonds are higher than local law bonds, that could negate the redenomination effect, and foreign law bonds should no longer trade at a premium in this scenario.

More detail on legal jurisdiction

The table below highlights the legal jurisdiction of a number of key eurozone assets.

While we cannot claim completeness, we have attempted to highlight the appropriate governing principals, whether Local, English or NY and the body of

[4] Hal S Scott, When the Euro Falls Apart, Intl Fin 1:2 1998, 207-228 (see link) lists particulars of UK and NY adoption of legislation to ensure continuity of contract.

Fig. 5: Governing law and standard financial securities and contracts

Governing Law	Security Type	Body of Law	Examples
Local Law	Sovereign Bonds, Bills	Local Statute/Contract	GGBs, Bunds, OATs
	International Bonds	Local Contract	Rep of Italy, Kingdom of Spain, etc
	Corporate Bonds	Contract	
	Covered Bonds (Pfandbriefe, OF, Cedulas, etc)	Covered Bond Law (Pfandbriefe)	Pfandbriefe, Obligacions Foncieres, Cedulas, Irish CBs
	Schuldscheine (marketable loans)	Contract	Banking schuldscheine
	Loans	Contract	
	Equities	Company	Any EU Equity
	Commercial Contracts	Contract	
	Deposits	Banking Law	CDs
English Law	Sovereign Bonds	Contract	Greek Euro-bonds, Rep Italy Eurobonds, Kingdom of Belgium USD-denominated bonds
	Corporate Bonds (Euro-bonds)	Contract	
	Loans (Euro-Loans)	Contract	Euro-Loans
	Commercial Contracts	Contract	
NY / Other Law	Sovereign Bonds	Contract	Yankees, Samurai, Kangaroos, Maple, Bulldogs, Dim Sum, Kauri, Sukuk, etc
	Corporate Bonds	Contract	
	Loans	Contract	
	Commercial Contracts	Contract	
Master Agreements	International Swap Dealers Association (ISDA)	English or NY Contract	IR Swap/Fwd, FX Swap/Fwd, CDS, Bond options
	Commodity Master Agreements	Various for each commodity	Gold Swaps/Forwards, Electricity Swaps/Fwds, etc
	Rahmenvertrag für Finanztermingeschäfte (DRV)	German Contract	Swaps and Repos with German counterparties
	Fédération Bancaire Française (AFB/FBF)	French Contract	Swaps with French counterparties and all local authorities
	Contrato Marco de Operaciones Financieras (CMOF)	Spanish Contract	Swaps with Spanish counterparties
	ICMA Global Master Repurchase Agrement (GMRA)	English Contract	Repo Agreements
	Master Repurchase Agreement (MRA)	NY Contract	Standard NY Law Repo Agreements
	European Master Agreement (EMA)	English Contract	Repo with Euro-systems NCB/ECB
	General Master Securities Loan Agreement (GMSLA)	English Contract	Sec lending
	Master Securities Loan Agreement (MSLA)	NY Contract	Sec lending
	(Euro) Medium Term Note Programme (MTN/EMTN)	English or NY Contract	WB, Rep Italy, EIB MTN Programmes
Other	Bond Futures (Eurex)	German Contract	Bund, Bobl, Schatz, BTP Futures on Exchange
	IR Futures (Liffe)	English Contract	Euribor Contracts on Exchange
	Equity Futures	Local Law/English Law	SX5E, DAX, CAC40, MIB, IDX, IBEX, BEL20, PSI-20,WBA ATX
	OTC Futures	English or NY Contract	Client back-to-back futures with member firm
	Clearing Houses (LCH, ICE, etc)	English Contract, etc	Repo, CDS etc via clearing houses
	Cash Sales	Sales or Transaction	All cash sales prior to settlement (i.e., before T+3)

Source: Nomura

law (e.g. Banking Law for deposits, Covered Bond law for Pfandbriefe, Company Law for Equities) which governs each security, contract or interest. In the case of English or NY law, the only relevant body of law likely will be contract law, as foreign law is only used as a means of contracting outside of a local jurisdiction, and no specific foreign statute could have an impact.

We give examples of the various financial instruments which trade. For instance, while BTPs and GGBs are governed by local statute and local contract law and for the most part international bonds (Rep of Greece Eurobonds, and Rep of Italy Eurobonds) are governed by English law or NY law, there are some countries which have issued international bonds (i.e., for international investors) under local law, making the outcome of a redenomination far less certain given the ambiguity of the nexus of the governing law.

What is obvious as well about this table is the vast number of master agreements which underpin most financial transactions. These include the various swap agreements from ISDA (under NY or English law) to those under French, German or Spanish law, as well as the various Repo and Securities Lending master agreements and MTN platforms for issuing bonds. Each master agreement involves far more paperwork than a single standalone swap contract or bond. But the setup costs ensure that once the master agreement is finished, individual swap and bond transactions can be documented quickly and efficiently. Moreover some master agreements such as MTNs may be flexible enough as to allow the issuance of bonds to be under various different governing laws.

The judicial process

In terms of the judgment, there will likely be some variance as to courts' decisions based on both the method for introduction of the new currency and any legislation directly binding on the courts. The general criteria for decision is as follows:

Local Courts

- **Specific Legislation** (a currency law) for Redenomination of Local Contracts into new currency can bind courts and overrule any contractual terms. It is particularly likely that contractual terms will be changed to re-denominate all local law contracts.

English Courts:

- **Lawful and Consensual Process implies application of *Lex Monetae* principle:** if legal nexus is to the exiting country then redenomination can happen in some cases. Otherwise, the Euro will remain the currency of payments.
- **Unlawful and Unilateral Withdrawal - No redenomination** -- As UK is signatory to the Treaties, unlawful withdrawal is manifestly contrary to UK public policy and no redenomination will likely allowed.
- EU Directive/UK Statute to redenominate and ensure continuity of contract: English Court must uphold UK statute and/or interpret UK Statute so as to be in agreement with EU directive and re-denominate.

NY/Other Courts:

- **Lex Monetae principle:** If legal nexus is to the exiting country then redenominate. Otherwise, leave in euro.
- **NY (or other) Statute to redenominate and ensure continuity of contract.** NY Courts must uphold NY State Legislation and redenominate contracts if so directed.

We note that the difference between lawful and unlawful exit/breakup is crucial for UK courts. This is, in particular, because the UK was signatory to the treaties, and unless otherwise directed, a Legal tender law from an exiting country in flagrant violation of the treaties will be considered to be manifestly contrary to UK public policy and the Lex Monetae of the Exiting Country will likely not be upheld in UK Courts. The legality of exit is of little consequence to NY and other non-EU courts and probably will not prejudice their judgments.

We thus expect that foreign law will insulate contracts from redenomination in the vast majority of cases, and in the UK in particular, will do so in all cases when the method of exit is unilateral and illegal. The one overriding concern would be the introduction of legislation (NY or EU/English) which circumvents any court decision, although due to the politics of exit, it is unlikely that any such legislation would occur unless there were complete breakup.

In a scenario where the eurozone breaks up in its entirety and the EUR ceases to exist, contracts cannot for practical purposes continue be settled in Euro□s. In this case, there are two basic solutions. Either obligations are redenominated into new national currencies by application of the Lex Monetae principle or there is significant rationale of the legal basis for the argument of *Impracticability* or *Commercial Impossibility*[5]. Alternatively, 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.

With specific mention of sovereign bonds, it is likely that local law sovereign bonds will immediately be redenominated, while the foreign-law bonds, with obvious international distribution, would likely remain in EUR.

Enforcement

The court of judgment is of some matter, but the court of enforcement is of paramount importance in determining payoffs. In particular, if the court is:

Local Court:

- Courts will enforce only in the local currency (as per the new Currency law) and conversion will take place at the time of award or at some official rate (which may differ from the market rate (see Nomura's Global Guide to Corporate Bankruptcy, 21 July 2010, link.)
- Insolvency: If the entity is undergoing an insolvency governed by local law, conversion is generally made at time of insolvency filing (irrespective of eventual award).
- There probably will be uncertainty over the timing of payment and the conversion rate may not be at market rates, but exchange controls may further complicate repatriation of awards.

English NY/Other Court:

- Redenomination is unlikely to change the award and enforcement will likely be made in appropriate foreign currency.
- Insolvency: If English or other court is determined to be the appropriate jurisdiction for insolvency, then delivery in appropriate foreign currency (see Global Guide to Corporate Bankruptcy, link)

The combination of the award and the enforcement risk highlight a number of interesting credit concerns. If there is an exit, local law instruments will typically be redenominated and there will be little protection in them, but foreign law affords far greater protection. If on the other hand the exit also involves an

[5] The more common *Frustration of Contract* is unlikely to apply, see Protter, Euro-Fragmentation.

insolvency, foreign law instruments may similarly afford little protection. This would be true, for instance, for Greek bonds. Generally, investors look to Greek Eurobonds for the extra protection afforded by English Law in an attempt to avoid some of the restructuring risk in GGBs. If, on the other hand, we take exit into account, it would make more sense for the Greek government to continue to service their GGBs using seignorage revenue (or perhaps with support of the CB) and default on the overly expensive Eurobonds. The current PSI discussions underway, however, appear to give little comfort to holders of either Greek or foreign law debt.

Eurozone assets by legal jurisdiction

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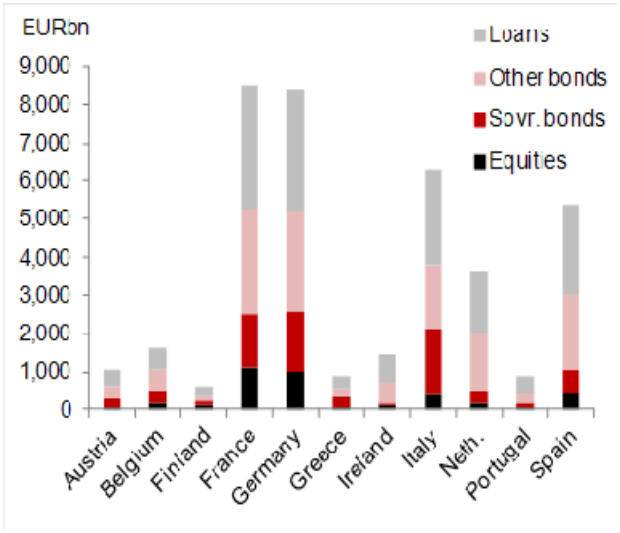
As we have shown in the previous chapter, the law under which a bond has been issued would be important in the case of redenomination. For this reason, we attempt to quantify how much of individual countries' debt has been issued under local law and foreign law. We find that core eurozone countries, such as Germany, France, and Belgium, have a smaller portion of debt issued under foreign law (under 20%) while smaller eurozone nations, such as Italy, Ireland and the Netherlands, have about 25-65% of total assets outstanding issued under foreign law.

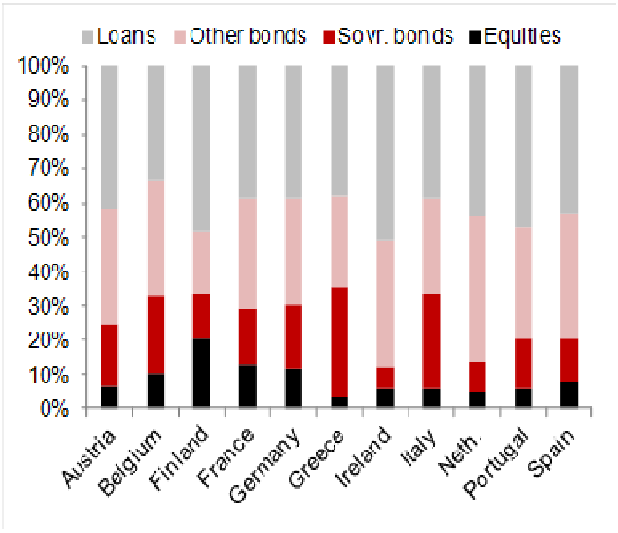
Before we dig directly into the issue of legal jurisdiction, it is useful to provide a broad outline of the spectrum of eurozone assets and obligations outstanding. The bar chart below shows the outstanding financial asset by country, broken into equity, bonds (sovereign and other), and loans.

Fig. 6: European assets (EUR bn)



Source: Nomura, BIS, Bloomberg

Fig. 7: European assets (Composition)



Source: Nomura, BIS, Bloomberg

Turning to the issue of legal jurisdiction, we use two different data sources: the BIS and Bloomberg, as both have different levels of precisions and coverage. While the BIS data covers all issuances, the level of detail does not allow us to determine exactly which laws (local or foreign) govern the issuance. In the case of Bloomberg, the database does not fully cover all the bond issues, but for most bonds, it is possible to extract information on the governing law. It is important to note that our results are only indicative and should not be viewed as completely comprehensive, given gaps in coverage.

The BIS data comes in two parts: 1) data on the outstanding amount of domestic debt, 2) the issuance and outstanding amount of international bonds. The BIS defines an international bond as "comprising all foreign currency issues by residents and non-residents in a given country and all domestic currency issues launched in the domestic market by non-residents. In addition, domestic currency issues launched in the domestic market by residents are also considered as international issues if they are specifically targeted at non-resident investors." On the flip side, domestic debt securities are those targeting resident investors.

Fig. 8: Assets outstanding in the eurozone – by location of issue - BIS data

Assets outstanding in the eurozone by location of issuance (bn EUR)						
	Sovereign		Financial		Nonfinancial	
	Domestic	International	Domestic	International	Domestic	International
Austria	112.7	88.3	123.1	158.0	35.9	35.7
Belgium	229.9	128.3	195.9	309.3	17.2	24.9
Finland	21.6	61.1	34.9	45.7	10.9	18.2
France	1448.2	54.0	981.9	1284.3	228.2	350.3
Germany	1432.0	256.6	388.6	1876.5	309.4	108.7
Greece	128.0	171.5	85.7	155.4	0.1	9.0
Italy	1622.2	204.5	585.6	821.6	286.9	79.7
Ireland	47.9	49.6	218.1	321.3	1.3	10.1
Netherlands	331.0	21.4	383.2	1022.5	94.4	74.3
Portugal	102.2	51.5	94.9	148.5	40.0	8.8
Spain	549.9	148.2	621.5	1316.9	18.7	18.7

Source: Nomura, BIS

Figure 8 shows the decomposition between domestic and international bonds outstanding by sector. Note that bonds issued by the financial arm of a non-financial corporation (e.g. Ford Motor Credit Company) are included in the financial sector.

Domestic issuances are most likely under local laws given they are targeted at resident investors, while international issuance are most likely under foreign laws to improve attractiveness. Also, it could be mandatory to issue under the law of the market of issuance. For example, a corporation issuing in the US market may be obligated to issue under US laws. In the case of the eurozone, the distinction between domestic and international market gets blurry since many entities issue in Luxemburg and mainly target non-nationals but are allowed to use domestic laws since it is within the currency zone. This means that a certain proportion of the eurozone countries' international debt securities are under local laws.

Focusing on sovereign bonds, this data shows that the largest eurozone countries such as Germany and France have a concentration of domestic debt issues. Meanwhile, smaller countries have a higher proportion of international debt.

Because of the shortcomings in the BIS data (i.e. the lack of specific information on governing law), we decided to take a more systematic approach, analyzing issuance bond by bond, using Bloomberg data

Using Bloomberg as a source, we looked through the entire data base of roughly 150,000 eurozone bonds. This approach allows us to individually verify the governing law of the various issues. The downside of this approach is that coverage is not as wide as the BIS, since some issues are not covered by Bloomberg. In addition, the prospectus is not available for some bonds, making it impossible to determine the governing law. Here, we define domestic bonds as bonds issued in the domestic market, while international bonds are bonds issued outside the domestic market. Contrary to the BIS data, issuances from financial arms of non-financial corporations are accounted in the non-financial category. This explains the discrepancy between the BIS data and the Bloomberg data for countries like Italy and the Netherlands.

The results show that Italy is the biggest issuer under foreign law in the eurozone, with foreign law international bonds outstanding amounting to EUR 790bn (calculated as the sum of sovereign, financial, and nonfinancial international bonds in Italy that lie under foreign law jurisdiction) driven by a large stock of non-financial debt issued under foreign law. It is followed closely

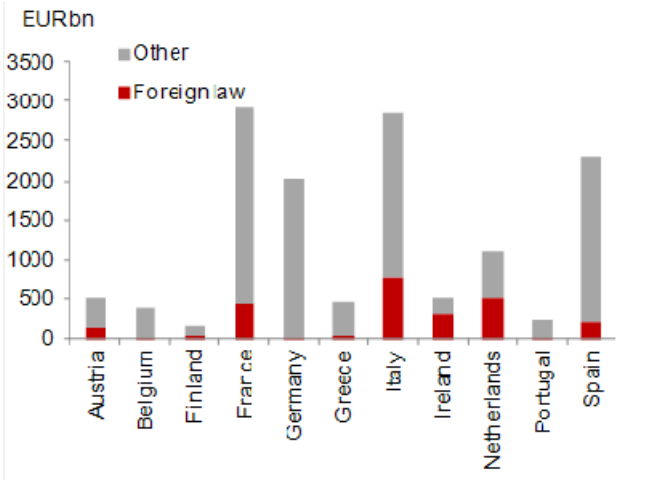
Fig. 9: Assets outstanding in the eurozone – by legal jurisdiction – sourced from Bloomberg

Assets outstanding in the eurozone by location of issuance (bn EUR)												
	Sovereign				Financial				Nonfinancial			
	Domestic	International			Domestic	International			Domestic	International		
	Local law	Local law	Foreign Law	Unknown	Local law	Local law	Foreign Law	Unknown	Local law	Local law	Foreign Law	Unknown
Austria	47	86	21	50	116	36	89	37	8	1	18	8
Belgium	314	9	0	5	4	3	11	3	2	8	11	5
Finland	72	0	9	15	2	1	11	22	2	2	20	3
France	1339	230	147	155	95	273	166	146	13	157	124	89
Germany	1368	23	1	12	260	61	3	6	154	83	24	22
Greece	223	62	12	63	0	1	33	51	20	0	3	2
Italy	1523	29	46	21	44	42	173	111	80	11	573	200
Ireland	85	29	0	0	3	44	121	24	0	4	191	7
Netherlands	312	0	2	1	10	146	81	123	5	2	435	2
Portugal	117	2	9	3	22	23	15	24	8	5	2	1
Spain	632	14	101	68	409	44	28	37	793	37	90	45

Source: Nomura, Bloomberg

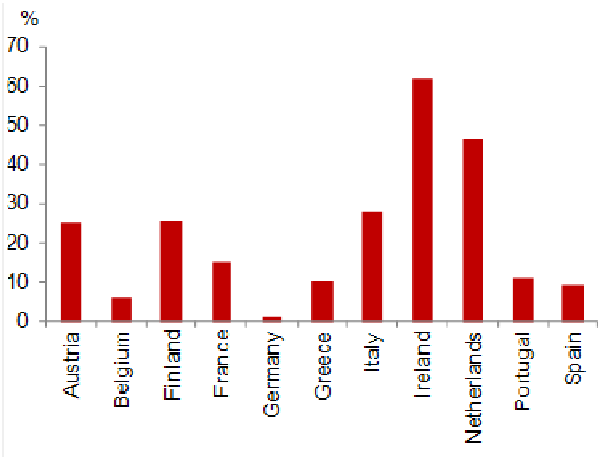
by the Netherlands with EUR 517bn (calculated as the sum of sovereign, financial, and nonfinancial international bonds in the Netherlands that lie under foreign law jurisdiction). Most of these foreign law issuances were issued under English or New York law. Germany and Spain also have large international bond markets, but most of the issuances are made under local law, perhaps because investors desire less protection on debt issued by big countries. As a share of total issuance, Ireland issues more than 60% of its bonds under foreign laws. This is likely the result of the issuance of bonds from the subsidiary of multinationals domiciled in Ireland, which would prefer to issue under English laws to attract international investors or keep all issuance under a common law framework.[6] It is clear that core eurozone nations have smaller amounts of bonds outstanding under foreign law than the smaller periphery countries.

Fig. 10: Bonds under foreign law



Note: Other includes all other bond issues under local law or unknown jurisdiction. *Source: BIS, Bloomberg, Nomura*

Fig. 11: Bonds under foreign law as a share of total bonds outstanding



Source: BIS, Bloomberg, Nomura

[6] See "Redenomination risk in peripheral corporate bonds " (Nomura Credit, December 16, 2011) for an analysis of the redenomination risk of a subsection of IG and HY bonds in peripheral eurozone countries.

Valuing new national currencies

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Investors holding EUR assets and obligations are facing risk of redenomination of contracts into new national currencies. To quantify the economic magnitude of the redenomination risk, we develop a transparent framework for valuing new national currencies. The framework is based on: i) current misalignment of the real exchange rate, ii) future inflation risk. The framework quantifies the medium-term depreciation risk associated with a redenomination into new national currencies. For a number of current eurozone member countries, the potential depreciation risk is very material.

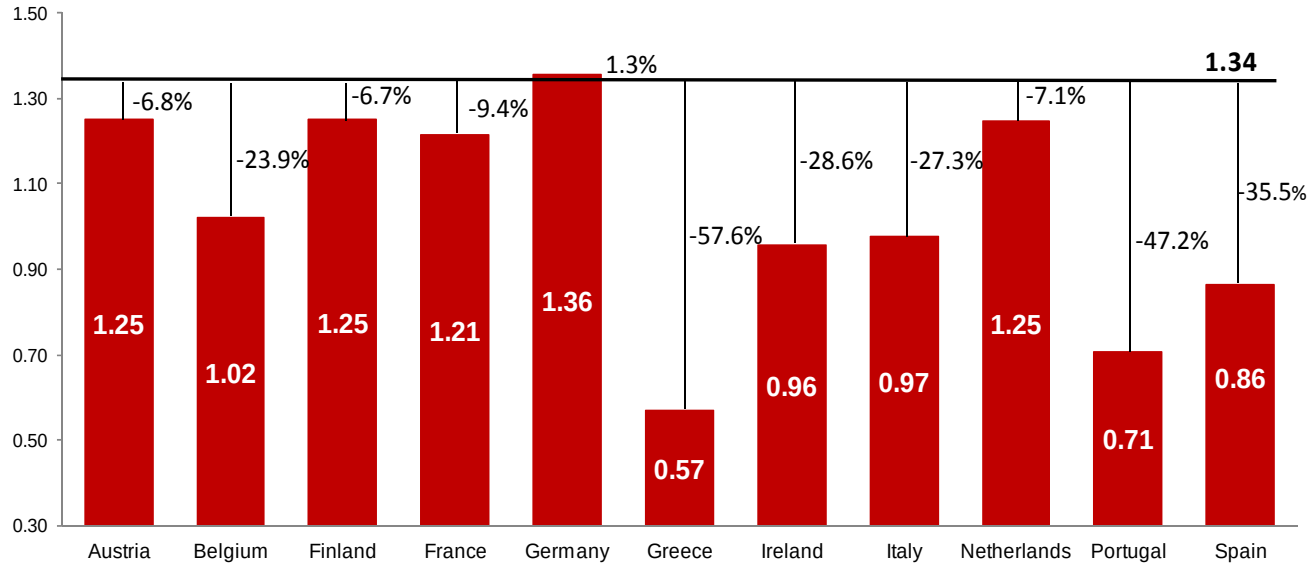
Currency risk in a eurozone break-up

We have discussed the importance of legal jurisdiction as a major determinant of redenomination risk in eurozone countries. Here, we discuss potential valuation of new national currencies following a eurozone break-up. The estimates could be relevant both in a limited break-up scenario (for the departing countries) and in a full-blown break-up scenario (for all eurozone countries).

We view these estimates as an initial benchmark for where currencies may trade in a "new equilibrium" following a potentially lengthy and extremely volatile transition period. Such estimates will be "moving targets", influenced by country specific policies, the global environment, and regional political developments in the European Union

For full disclosure, we are not regarding the break-up scenario as our central case. But it has become a real risk over the last few months, and a possibility which investors should now plan for.

Fig. 12: Fair value estimates for new national currencies in a eurozone break-up scenario



Note: These fair value estimates are calculated for the national currencies of each of the 11 original eurozone members and are based on a 5-year horizon following a potential eurozone breakup. The percentages included in the chart represent the degree of appreciation/depreciation from the EUR/USD value, which stood at roughly 1.34 as of early December. *Source: Nomura*

A framework for valuing new national eurozone currencies

Currency valuation is a complex exercise, and the uncertainties associated with a eurozone break-up further complicate the analysis.

There are many possible permutations for a break-up. To simplify the analysis, we will focus on currency valuation at the national level – country by country – rather than for possible new groups of countries. We think this exercise is instructive, as even if some eurozone countries manage to maintain a currency union, the value of a new composite currency is likely to be linked to the value of the individual component currencies. Similarly, currency projections at the national level can be used in a bottom-up valuation exercise for a new European Currency Unit (ECU-2).

Since the uncertainties in the valuation exercise are large, we want to focus on a relatively simple and transparent framework. And we want to stress up-front that these estimates are unlikely to be particularly precise. They are intended to give a sense of potential magnitudes involved over a 5-year forward time frame, after which we believe temporary transition effects should be smaller. Our framework for valuing potential new national eurozone countries concentrates on two main medium-term effects:

1. Current real exchange rate misalignments: The eurozone currency union has, by definition, disabled the normal FX adjustments, which would happen under a flexible exchange rate regime. Moreover, given rigidities in nominal prices, especially in terms of downward adjustments of wages, real exchange rates are now potentially significantly misaligned from their “equilibrium” levels in some countries. The first component in our valuation framework is an estimate of the current real exchange rate misalignment.

2. Future inflation risk: A break-up of the eurozone would mean that individual eurozone countries would return to independent monetary policies. The national central banks would have differing inflation fighting credibility and face varying degrees of pressure to provide liquidity for banks and public institutions. Those differences would leave potential for significant divergence in inflation trends. The second component in our valuation framework is the projected future inflation risk.

A eurozone break-up will create additional short-term risks and require new risk premia for investors. These extraordinary risk premia will vary by country depending on factors such as market volatility and liquidity conditions, as well as issues relating to capital controls, including possible taxes on capital flows. Since our analysis is focused on equilibrium considerations over a 5-year period, we will not focus directly on these more temporary effects, although we recognize that they could be crucial in the short-term.

Quantifying current real exchange rate misalignment

It is fairly uncontroversial that some eurozone countries are facing significant competitiveness issues associated with overvalued real exchange rates. One simple indication of this is the extremely high peak and average trade and current account deficits observed in Greece, Portugal and Spain in the post-EMU period (see Figure 13 below).

Fig. 13: Current account deficits of eurozone countries: recent vs. historical (% of GDP)

	Post-EMU (%)		Pre-EMU (%)	
	Peak	Average	Peak	Average
Greece	-14.6	-9.1	-3.8	-2.4
Portugal	-11.6	-9.0	-6.8	-2.0
Spain	-10.0	-5.8	-3.6	-1.8
Ireland	-5.3	-2.1	-1.5	1.6
Italy	-3.4	-1.6	-2.7	0.3
Belgium	-2.9	2.6	1.8	4.1
France	-1.9	0.1	-0.8	0.7
Germany	-1.7	3.5	-1.4	0.0
Austria	-1.6	1.7	-2.9	-1.2
Finland	1.3	4.9	-5.4	-0.1
Netherlands	1.9	5.4	2.1	4.1

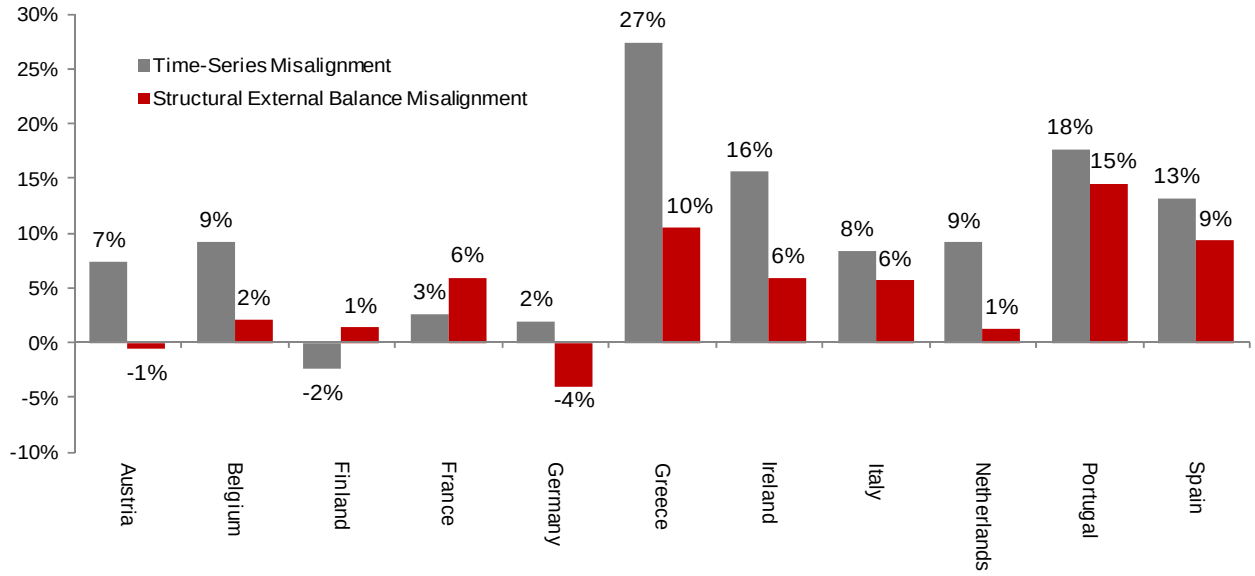
Note: Post-EMU period is defined as 1999-current day for all countries, including Greece. Pre-EMU period is defined as 1989-1999. *Source: Nomura, Eurostat*

In order to quantify current exchange rate misalignments, we use two alternative frameworks:

First, we use a standard framework based on equilibrium current account and sustainable net foreign assets positions to estimate currency adjustments in real effective terms which would be consistent with achieving external balance. Specifically, we draw on the work of the European Commission in terms of assessing competitiveness (see Surveillance of intra-euro-area competitiveness and imbalances), and we use the average estimates of the real effective exchange rate misalignment from the current account and net foreign asset based approaches.

Second, we use a time-series based approach to gauge real exchange rate misalignment. Specifically, we look at the position of current bilateral real exchange rates vs. the Dollar relative to the rates which prevailed in the period prior to EMU entry. This is not a perfect benchmark, since structural changes may have happened in the meantime, but it does provide a sense of currencies' 'natural' equilibriums over a period where market forces generally played a dominant role.

Fig. 14: Estimates of current misalignment of country-specific real exchange rates



Note: Positive figures indicate overvaluation. *Source: Nomura*

The two approaches give generally similar conclusions, although the specific magnitudes of implied misalignment differ to some degree. Averaging the two approaches shown in the chart by country, current currency misalignment is estimated to be the largest in Greece (18.9%), followed by Portugal (16.1%) and Spain (11.2%). At the other end of the spectrum, Germany and Finland stand out as the two countries with potentially undervalued real exchange rates (-1.1% and -0.5%, respectively). All other eurozone countries appear to have real exchange rates which are closer to fair value currently, although the general bias is towards moderate overvaluation.

Quantifying future inflation differentials

In a break-up scenario where individual eurozone countries return to independent monetary policy, there is potential for significant divergence in inflation rates. Projecting future inflation is challenging under normal circumstances, but it is doubly difficult in an environment of severe instability and structural changes associated with establishing new frameworks for monetary policy at the national level.

Nevertheless, there are a number of parameters which help gauge the country specific inflation risk in a eurozone break-up scenario. Here, we will focus on four main parameters that we think are important. We do not view this as a complete analysis, but rather as an initial attempt to quantify some of the key parameters involved.

We focus on four parameters which measure future inflation risk:

1. Sovereign default risk: Financial stability and conduct of sound monetary policy is closely linked to fiscal stability. From this perspective, sovereign default risk will be a key parameter influencing future inflation risk. This is especially the case since sovereign default is likely to trigger a domestic banking crisis, in which case central bank action may be partially dictated by the liquidity needs of banks. We look at the implied default probability in 5yr CDS to quantify sovereign default risk per country.
2. Inflation pass through: The degree to which the inflation process is vulnerable to shocks depends on openness, indexation, unionization, terms-of-trade volatility and other factors. The exchange rate pass-through is a summary measure, which captures a number of these effects. Past inflation volatility is another proxy for susceptibility to shocks, such as energy price shocks. We use estimates from academic studies of the exchange rate pass-through coefficient per country and we combine this with the observed volatility of CPI inflation in the past at the country level.
3. Capital flow vulnerability: Combination of Large current account deficits combined and a weak structure of capital flows can leave a vulnerable capital flow picture. A vulnerable balance of payment situation may imply a higher risk of capital flight, with implications for money demand and inflation dynamics. We look at the basic balance, defined as the current account balance plus net foreign direct investment flows, as a simple metric of capital flow vulnerability by country
4. Past inflation track record: Inflation expectations can have long memory, and past experiences may matter when new monetary policy frameworks are put in operation. The inflation track-record before Euro entry may therefore be important. We look at inflation performance in the pre-Euro period (1980s and 1990s) by country.

In order to translate these different metrics of future inflation risk into a common indicator, we use a simple scoring method.

The *first step* is to define the range of possible outcomes for future inflation. There is no obvious upper limit to how much inflation could result in a worst-case scenario. But we think a look at countries affected by currency crises in the past may provide some clues.

The table below looks at inflation dynamics around a number of prominent currency crises in the past (Argentina 2001, Thailand 1997, Indonesia 1997, Russia 1998 and Mexico 1994). We define the "inflation shock" as the increase in average annual inflation in the five years following the beginning of the currency crisis, as compared to the inflation level in the two years prior to the crisis. The table shows that Russia is an outlier, with a very large inflation shock of 22%. A number of the other examples (Indonesia, Mexico and Argentina) show a cluster around 15%, while Turkey was an outlier in the other direction, with a negative inflation shock, due to successful macroeconomic stabilization.

Fig. 15: Inflation dynamics in times of currency crisis (y-o-y CPI inflation)

	2 years prior to currency crisis (A)	5 years following currency crisis (from date of de-peg)					Average post-currency crisis inflation (B)	Inflation shock (B)-(A)
		1st year	2nd year	3rd year	4th year	5th year		
Russia	14	97	32	22	17	14	36	**22.0**
Mexico	8	35	35	21	16	17	25	**16.3**
Indonesia	7	34	50	2	10	13	22	**14.6**
Argentina	-1	26	15	4	10	11	13	**14.1**
Brazil	8	15	7	7	4	4	7	**-0.4**
Thailand	6	9	2	1	2	1	3	**-2.8**
Turkey	59	57	43	25	10	8	29	**-30.8**

Source: Nomura, Bloomberg, Eurostat, OECD

We use this analysis to define an extreme upper limit of 15% on the potential inflation shock eurozone countries could experience on an annual basis over a 5-year period, following a eurozone breakup. To define a lower limit, we look at the lowest CPI readings observed in the eurozone over the last 20 years. There have been many episodes of moderate deflation, but peak deflation has generally not seen CPI inflation drop below minus 2%. We use this as the lower limit of the inflation shock.

The second step is to map the four inflation risk parameters into this scale (from -2% to +15%). We do this by mapping sovereign default risk, inflation pass-through, past inflation measures into a -2%-15% scale using the cross-sectional distribution of the parameter values. Similarly, we map the external balance measures into a 0% to 15% scale, assigning a value of 0 to all countries with a positive external balance. These calculations are summarized in Figure 16. (For a more detailed view of future inflation risk calculations, see *Box 4: Complete calculation of future inflation risk* below)

Fig. 16: Inflation risk parameters and potential future inflation shock in a break-up scenario

	Sovereign Default Risk (%)	Inflation Pass-Through		Capital Flow Vulnerability (%)	Past Inflation (%)	Total Future Inflation Shock (%)
		FX Pass-Through	CPI Volatility			
Austria	14.2	0.77	0.9%	3.0	3.1	**1.1**
Belgium	22.7	0.83	1.2%	-7.6	3.5	**4.1**
Finland	5.8	0.77	1.3%	3.1	4.7	**1.5**
France	15.2	0.79	0.7%	0.4	4.6	**1.6**
Germany	7.9	0.75	0.7%	7.0	2.7	**0.5**
Greece	99.6	0.78	1.0%	-11.2	15.3	**11.1**
Ireland	45.2	0.56	2.8%	-4.8	5.8	**5.3**
Italy	32.8	0.94	0.7%	-2.7	7.7	**4.9**
Netherlands	8.9	0.79	0.9%	9.0	2.7	**0.9**
Portugal	59.7	0.82	1.3%	-12.6	11.9	**9.3**
Spain	28.4	1.04	1.2%	-5.5	7.2	**6.1**

Source: Nomura, Bloomberg, Eurostat, FRB

In order to keep the real exchange rate constant, and maintain competitiveness, equivalent annual depreciations of nominal exchange rates would be needed. For example, assuming no inflation shock in trading partner countries, this analysis suggests that the new Greek currency would need to depreciate by 47.7% in nominal terms over a 5-year period in order to compensate for the cumulative inflation differential over the period. At the other end of the spectrum, Germany and the Netherlands stand out, and our estimates suggest that Germany may experience only very moderate inflationary pressure in a eurozone breakup scenario (less than 1%). In addition, both countries also have a better inflation track-record than the US, which is our benchmark country.

Box 4: Complete calculation of future inflation risk

	Sovereign Default Risk		Inflation Pass-Through			Capital Flow Vulnerability		Past Inflation (%)		Future Inflation Risk (%)
	Implied Default Probability	Inflation risk #1	FX Pass-through	CPI Volatility	Inflation risk #2	Basic Balance	Inflation risk #3	Past Inflation	Inflation risk #4	
Austria	14.2	0.4	0.77	0.9%	2.6	3.0	0.0	3.1	1.5	**1.1**
Belgium	22.7	1.9	0.83	1.2%	5.1	-7.6	7.6	3.5	1.9	**4.1**
Finland	5.8	-1.0	0.77	1.3%	3.7	3.1	0.0	4.7	3.2	**1.5**
France	15.2	0.6	0.79	0.7%	2.7	0.4	0.0	4.6	3.1	**1.6**
Germany	7.9	-0.7	0.75	0.7%	1.5	7.0	0.0	2.7	1.0	**0.5**
Greece	99.6	14.9	0.78	1.0%	3.1	-11.2	11.2	15.3	15.0	**11.1**
Ireland	45.2	5.7	0.56	2.8%	6.1	-4.8	4.8	5.8	4.5	**5.3**
Italy	32.8	3.6	0.94	0.7%	6.8	-2.7	2.7	7.7	6.5	**4.9**
Netherlands	8.9	-0.5	0.79	0.9%	3.1	9.0	0.0	2.7	1.0	**0.9**
Portugal	59.7	8.1	0.82	1.3%	5.1	-12.6	12.6	11.9	11.2	**9.3**
Spain	28.4	2.8	1.04	1.2%	10.0	-5.5	5.5	7.2	6.0	**6.1**

Source: Nomura, Bloomberg, Eurostat, FRB

This table is an extension of Figure 16, showing the raw inputs contributing to each of the four intermediate measures (labeled Inflation risk #1-4) used to calculate the final future inflation risk percentage. Each subcomponent is indexed from -2 to 15, with values less than zero representing future deflation and values greater than zero representing future inflation. The exception to this indexation method is the basic balance, which was indexed from 0 to 15 because a surplus in a country's balance would not imply negative inflation risk. In the case of inflation pass-through, indexed FX pass-through and indexed CPI volatility were averaged together to find a final indexed value of inflation pass-through (inflation risk #2). Following this process, inflation risks #1-4 were averaged together to find an overall future inflation risk value for each eurozone country.

Valuation of new national currencies: A two-factor approach

Having quantified the two components of our valuation framework, we can derive fair value estimates of new national currencies as the product of the two effects: i) the current real exchange rate misalignment, and ii) the future inflation risk. Our model has an explicit medium-term focus, and in order to make the investment implications clear, the results are expressed in nominal terms, relative to the dollar. We note again that the framework is not incorporating extraordinary risk premia, which could be very significant in the transition period toward a new equilibrium.

The key results are summarized in the table below, and they are based on the nominal exchange rate value versus the dollar from early December (1.34).

Fig. 17: National currency fair value projections in a eurozone break-up scenario

	Fair Value Estimate		Estimated change due to:	
	Estimate	Total Change (%)	Current FX Misalignment (%)	Future Inflation Risk (%)
Austria	1.25	-6.8	-3.4	-3.5
Belgium	1.02	-23.9	-5.6	-19.3
Finland	1.25	-6.7	0.5	-7.2
France	1.21	-9.4	-4.3	-5.4
Germany	1.36	1.3	1.1	0.2
Greece	0.57	-57.6	-18.9	-47.7
Ireland	0.96	-28.6	-10.8	-19.9
Italy	0.97	-27.3	-7.0	-21.8
Netherlands	1.25	-7.1	-5.2	-2.0
Portugal	0.71	-47.2	-16.1	-37.1
Spain	0.86	-35.5	-11.2	-27.3

Note: Estimates should be viewed as 5-year ahead fair value projections. *Source: Nomura*

The fair value calculations show potential for significant (58%) depreciation of the new Greek drachma relative to the US dollar, followed by a 47% depreciation of the new Portuguese escudo. Perhaps not surprisingly, our estimates also suggest that Ireland, Spain and Italy are likely to see significant depreciation of new national currencies in a break-up scenario. We estimate depreciation of about 25-35% for this group, driven by a combination of the two factors in our framework.

At the other end of the spectrum, Germany stands out as facing no material depreciation risk within the equilibrium framework considered. In fact, our estimates suggest a marginal appreciation potential, although the effect is too small to be economically meaningful.

The countries not in our story…

Our study has focused on the first 11 eurozone member countries, although the analysis excludes Luxembourg, which is likely to re-peg its currency to another "stable" European country, given its very small size. We have also excluded the five newcomers to the eurozone: Slovenia, Slovakia, Cyprus, Malta, and Estonia from this initial study.

The reason is two-fold. First, these countries are all relatively small in terms of the size of their economies and their financial markets. Second, the methodology we have been using is not directly suitable for the countries which joined the eurozone later on. We may do a customized analysis for those countries at a later date.

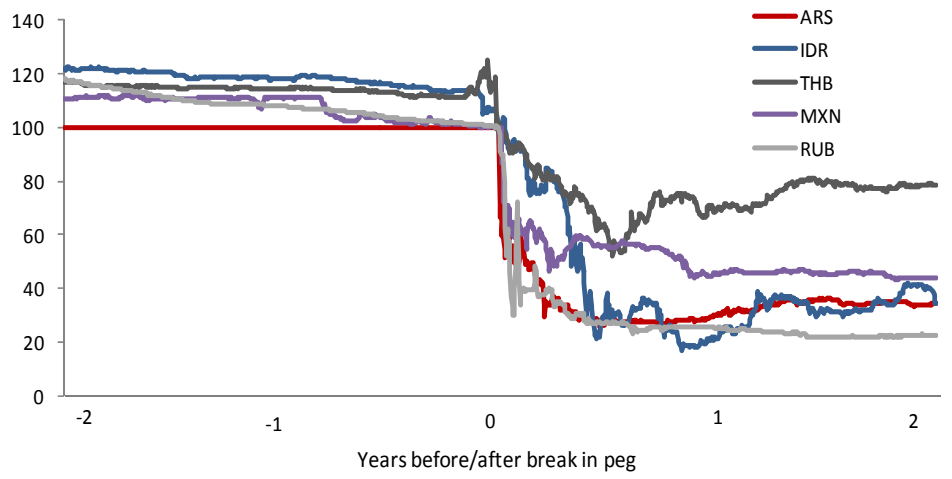
How to interpret the results

Our estimates provide an initial attempt to quantify potential medium-term depreciation risk of individual national eurozone currencies in a break-up scenario.

Our estimates are based on the notion that the real exchange rate in most developed markets tends to have a mean-reverting component, meaning that it settles at a new equilibrium level after the effect of temporary shocks have abated. This again implies that the nominal exchange rate in the medium-term (which we define as a 5-year period) can be viewed as a function of i) the current real exchange rate misalignment, and ii) cumulative inflation differentials.

The framework does not explicitly incorporate effects, which could permanently affect the level of the real exchange rate. Such effects include permanent terms of trade shocks and diverging productivity trends. Since, we are dealing with eurozone countries, which generally have limited commodity resources, we do not think the exclusion of terms-of-trade dimension is likely to be crucial, and we do incorporate an effect from varying inflation pass-through when accounting for inflation risk in our framework. We recognize that structural reform initiatives could have a significant impact on productivity growth, and may need more consideration over time. At this stage, however, it seems almost impossible to quantify such effects, and we have not yet made the attempt.

Fig. 18: Depreciations of currencies in the 2 years surrounding breaks from pegs



Source: Nomura, Bloomberg

The framework also does not incorporate cyclical effects, which could be material. A break-up scenario would likely involve important growth underperformance in Europe overall, relative to the Americas and Asia, for example, with implications for real interest rate dynamics. But this effect would come in addition to the effects analyzed here.

Our estimates are explicitly dealing with a medium-term concept of currency fair value. In the shorter-term, however, other influences on the exchange rate could be significant. This is the experience from previous currency crises. In the Argentine crisis, for example, the Argentine Peso staged a dramatic drop of 72% in nominal terms in the five months following its break off the peak, and this move arguably exceeded what turned out to be justified from a real exchange rate analysis perspective.

In general, the short-run path is likely to be influenced by the interaction between a number of forces. Certain extraordinary risk premia are likely to be required by investors and other market participants to compensate for risk associated with excess volatility and illiquidity. In addition, there may be additional risks associated with capital controls, including taxes on capital flows. High local interest rates may provide partial compensation for such risk, limiting the need for a depressed currency value, although this may again depend on the condition of the banking system, which could well be in a very fragile state.

Do you remember the ECU?

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A full-blown break-up of the eurozone would necessitate redenomination into new *currencies*. A *new European Currency Unit (ECU) would make this re-denomination process more orderly for a myriad of contracts and obligations currently in EUR. Before the euro came into existence,* the *ECU was the unit of account in the European Union. When the euro was born in 1999, ECU obligations were re-denominated into EUR. We believe that a new ECU is likely to play an important role in the case of a* full-blown *eurozone break-up*. I*nvestors should start to think about the future value of a new ECU (or what we might call, the ECU-2).*

Developments over the last few months imply that the risk of a eurozone break-up has increased materially. As previously discussed, there is rising risk of both a limited break-up and a full-blown break-up:

- A ***very limited break-up*** scenario would involve one or a few smaller countries exiting the eurozone, while core eurozone countries continue to use the euro. A Greek exit from the eurozone would be an example of this.
- A ***"big bang" break-up*** scenario implies the euro ceases to exist and that all eurozone countries move to new national currencies (or possibly new currency unions). An Italian default could see this scenario become a distinct possibility, in our opinion.

Fig. 19: ECU basket currency weights over time

	Original ECU weights			ECB Weights
	Apr 1990 - Nov 1992	Nov 1992 - Mar 1995	Mar 1995 - Dec 1998	
Belgium	7.8%	8.1%	8.4%	2.4%
Denmark	2.5%	2.6%	2.7%	-
Germany	30.5%	31.7%	32.7%	18.9%
Greece	0.8%	0.6%	0.5%	2.0%
Spain	5.2%	4.8%	4.2%	8.3%
France	19.4%	20.2%	20.8%	14.2%
Ireland	1.1%	1.2%	1.1%	1.1%
Italy	9.9%	9.0%	7.2%	12.5%
Luxembourg	0.3%	0.3%	0.3%	0.2%
Netherlands	9.5%	9.9%	10.2%	4.0%
Portugal	0.8%	0.8%	0.7%	1.8%
UK	12.1%	10.9%	11.2%	-
Austria	-	-	-	1.9%
Finland	-	-	-	1.3%
Estonia	-	-	-	0.2%
Cyprus	-	-	-	0.1%
Malta	-	-	-	0.1%
Slovenia				0.3%
Slovak Republic	-	-	-	0.7%
Total	100.0%	100.0%	100.0%	70.0%

Note: ECB weights are based on current levels of paid-up capital of euro area national central banks, as reported by the ECB. These figures add up to 70% of all paid-up capital in the euro area. *Source: Nomura, ECB*

In the "*Legal Aspects* of redomination" section of this publication, we analyzed a number of legal parameters which impact the redenomination risk of EUR-denominated obligations in a eurozone break-up. We argued that investors should consider three main parameters when evaluating 'redenomination risk': 1) legal jurisdiction under which a given obligation belongs; 2) whether a break-up can happen in a multilaterally agreed fashion; and 3) the type of eurozone break-up which is being considered, including whether the euro would cease to exist.

Here we provide more detail on the role of a new European Currency Unit (ECU-2) in facilitating redenomination of contracts and obligations in a full-blown eurozone break-up. We make comments about the potential value of the ECU-2 in the next section.

The need for a new European Currency Unit (ECU-2)

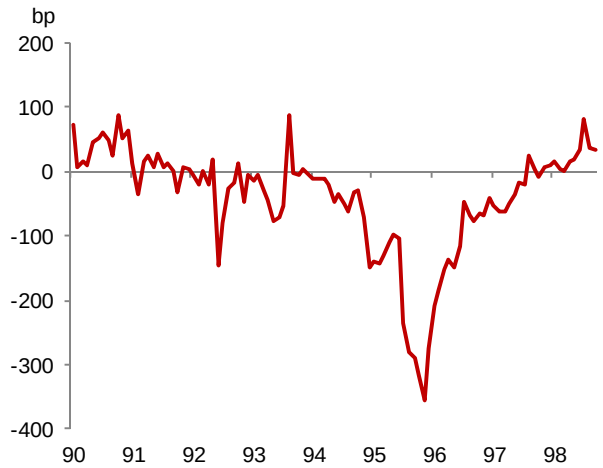
In a full-blown break-up of the eurozone, the euro would cease to exist as a functioning currency and some form of redenomination of EUR-denominated contracts and obligations would be needed.

In this situation, the so-called Lex Monetae principle could help establish a framework for redenomination. If it can be argued that the currency of a given obligation refers to the currency of a certain country, rather than the euro (the currency of the European Union), then redenomination from euro to the new national currency is feasible, and in some cases likely.

How the Lex Monetae principle would be applied to specific contracts and obligations would depend on whether contracts have an explicit nexus to a sovereign state (which is rare) or whether an implicit nexus to a certain country can be established (which is more likely). Whether a clear link to a certain country can be determined may depend on parameters such as the governing law of the obligation, the obligor/debtor's location, and the place of payment.

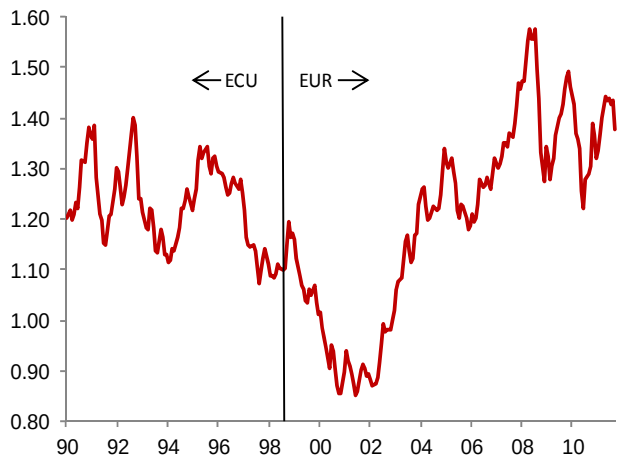
In certain cases, application of the Lex Monetae principle would seem fairly straightforward. One example would be a Greek household's bank deposits in a Greek bank. These would be governed by local Greek law, the debtor would be located in Greece and the place of payment of such deposits would also be Greece. Another example would be Italian government bonds issued in Italy under Italian law. More generally, obligations with a clear nexus (even if

Fig. 20: Spread between private ECU and official basket



Source: Nomura, FRB, ECB

Fig. 21: ECU/USD and EUR/USD



Source: Nomura, ECB

implicit) to a certain country have potential to be redenominated into a new national currency, even if the original obligation was EUR denominated.

Other cases are less straightforward. There are many examples of obligations and contracts where there is no clear nexus to a specific eurozone country. Examples where it would be very hard to link EUR-denominated obligations to a specific country include:

- A EUR-denominated loan from a UK bank to a Polish corporation.
- A EUR/USD FX forward transaction between a Japanese bank and a US asset manager.
- A fixed/floating interest rate swap between a French bank and a German insurance company.

The notional value of contracts and obligations where a re-denomination into new national currencies would be problematic and potentially arbitrary is very large (adding up to trillions of euros, or in the future, ECUs).

This is a major issue, especially since case law suggests that contracts and obligations are unlikely to be 'frustrated' simply due to their redenomination. Contracts and obligations would continue to live on after the euro ceased to exist. Hence, making the redenomination process as smooth, fair and efficient as possible is likely to be an important goal, including in relation to macroeconomic performance, such as growth.

From this perspective, a new ECU (ECU-2) could play an important role in facilitating an orderly redenomination process for the myriad contracts and obligations that do not have a clear country specific nexus.

A brief history of the original ECU

The European Currency Unit (ECU) was created by the European Monetary System (EMS) in March 1979. The ECU originated as a basket of nine national currencies, each with its own particular weight based on such economic factors as the country's GNP and intra-community trade. The ECU basket was adjusted in 1984 to include the Greek drachma and amended again in 1989 to include the Spanish peseta and the Portuguese escudo. The ECU was intended to stabilize the national currencies and eventually create a single composite currency.

There was never an official mechanism to convert private ECUs one for one into the basket of the ECU currencies corresponding to the definition of the official ECU. From 1979 to 1988, a group of private European clearing banks stood ready to convert private ECUs into the basket at par. This 'convertibility' at par ended in 1988, and from then on the private ECU was in principle a free floating currency. Linked to this, a gap between the composite interest rate on underlying ECU currencies at the actual ECU interest rate (a fixing of which was administered by the BIS) also opened up.

Initially, however, the private ECU continued to trade close to par versus the official basket and this period of stability (1990-91) saw significant issuance of ECU-denominated debt instruments by European sovereigns and supranational institutions.

Things changed during 1992 as tensions in European currency markets surfaced. This was the case especially during the ERM crisis, when the private ECU traded at a discount of 250bp to the basket. The exchange bands of the ERM had to be expanded to 15% in 1993, and only France, Denmark, Belgium and the Netherlands managed to avoid devaluations of central ERM parities, while the UK, Italy, Spain, Portugal, Finland and Sweden all had to exit the ERM in some form.

The value of the private ECU eventually converged to that of the underlying basket on increasing expectations (in 1997-98) that the ECB would eventually

enforce par convertibility between the private ECU and the official ECU basket. Finally, on 1 January, 1999, the ECU was replaced by the euro at parity.

The process of re-denominating ECU obligations into EUR is also interesting as it involved an EU regulation that held that the introduction of the euro should not terminate (or alter the terms of) any legal instruments. Moreover, several foreign jurisdictions, including the State of New York, passed legislation to ensure that the euro was recognized as the successor to the ECU. These steps ensured that ECU obligations, whether under local (EU) jurisdiction or foreign (e.g., New York) law, could be smoothly redenominated into euro, with effect from 1 January, 1999.

How redenomination to ECU-2 could work

The process by which ECU-denominated obligations where re-denominated into euro in the third phase of the EMU may serve as a template for how a reverse-re-denomination of certain EUR obligations into ECU-2 could work.

An EU directive could:

- Outline a framework to determine which EUR-denominated contracts and obligations would be re-denominated into new national currencies, in accordance with the Lex Monetae principle.
- Provide guidance for re-denomination into ECU-2 of contracts without a clear explicit or implicit nexus to a certain eurozone state.

Foreign courts and new legislation in foreign jurisdictions may determine how this process would be handled in connection with obligations issued under foreign laws. Alternatively, an EU directive may seek to re-denominate a broader set of EUR-denominated obligations into ECU-2, without application of the Lex Monetae principle to certain obligations.

Following the implementation of the EU directive and re-denomination into ECU-2 of certain contracts, payment on contracts and obligations which were originally in euro would then be affected by delivering ECU-2, or more specifically, an acceptable equivalent in a given new national currency, based on official fixing rates between the ECU-2 basket and national currencies.

As mentioned above, from 1990 to 1998, the private ECU traded freely in the market and there was no private or official mechanism in place to ensure it traded in line with its theoretical value, as defined by the weights of the individual ECU component parts and their market-based exchange rates.

The private ECU was to some degree anchored by expectation of eventual conversion of ECU assets into EUR assets, but the strength of this anchor varied based on the conviction of the market that eventual conversion would happen. However, during a reverse process of re-denominating euro obligations into ECU-2, there would be no such anchor because there would be no expectations of future conversion at a given rate. To avoid problems associated with this lack of determinacy, some provision would likely be needed to allow settlement of ECU-2 denominated obligations in national currencies, in accordance with the market-based value of the ECU-2, as calculated from ECU-2 weights and the exchange rates of its component parts. In the next section, we will estimate potential ECU-2 fair values in the case of a eurozone break-up.

How to value the new ECU

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We have argued that defining a new ECU would be important in facilitating an orderly redenomination process for certain eurozone assets and obligations. We also argued that introducing an ECU would be logical from a historical perspective. A transition process from EUR to ECU-2 for certain EUR denominated obligations could potentially reduce a number of difficult legal problems associated with redenomination, although the process is highly unlikely to be as smooth as was the case in 1999. In this piece, we focus on the potential future value of the new ECU (ECU-2).

Conceptually, there are two key fundamental inputs in the ECU-2 valuation exercise:

- The weights of individual national currencies in an ECU-2 basket; and
- The (expected) FX rates of the individual new national currencies.

We start out with comments on the weights before we turn to the actual valuation exercise based on the previous work we have done on the potential valuation of new national currencies in a eurozone break-up.

Potential weights of the new ECU

The specific nature of any break-up process would play an important role in determining the weights of individual national currencies in an ECU-2.

If the break-up process happens in sequential fashion (rather like peeling an onion) where weaker eurozone countries exit one by one, we could see a situation where stronger eurozone countries have relatively large weightings at the time when a full-blown break-up happens and euros are redenominated to ECU-2s.

However, if a break-up happens more like a big-bang, presumably all eurozone countries (including weaker eurozone countries) would have a weight in the ECU-2, provided that the break-up is multilaterally agreed.

There are other theoretical options, such as an initial German exit from the eurozone, but we regard these as highly unlikely. Hence, the main question to ask, in our opinion, is how likely a sequential break-up is and how far this process could extend.

As we argued in the chapter on “possible break-up scenarios, two types of break-up scenarios are possible in our view: a very limited break-up scenario and a ‘big bang’ break-up scenario. A sequential ‘onion peeling’ type of break-up process, which would see only stronger core countries remain in the eurozone, is highly unlikely in our view. Such a process would break down when it reached larger countries, such as Spain or Italy. One reason for this is that it would likely trigger a collapse of large parts of the eurozone banking system, including the very core. Hence, when determining weights for the new ECU, we focus on scenarios where all *major* eurozone countries will have a weight (as would be the case in a big-bang break-up). We also run scenarios where Greece, Ireland and Portugal are excluded, based on the idea that they could exit the eurozone before a big-bang collapse. But given their small size and small equity weights in the ECB, it does not make a large economic difference whether they are excluded or not.

The original ECU weights were determined based on the size of the economy and the magnitude of intra-EU trade, although no strict mathematical formula

was applied. A similar approach may be applied in the future, but it is more likely that the ECB equity weights (derived from the size of the national population and GDP) will be used.

The current ECB equity weights are shown in column A in Figure 1 below. Our baseline ECU-2 weights are shown in column B of the table. Note that we have excluded six of the smallest eurozone countries from this calculation (Luxemburg, Cyprus, Malta, Slovenia, Slovakia and Estonia). This is because their weights are likely to be very small (their combined ECB weight is 1.9%) and partially because having very small and illiquid basket components in the ECU may make it harder to manage from an operational perspective.

One caveat in relation to the weights is that the ECU would only work if new national currencies remain convertible and actively traded. This is similar to the considerations behind the IMF's SDR basket, which only consists of highly liquid convertible currencies (USD, EUR, JPY and GBP). In order to use the ECU basket effectively for settlement and delivery purposes, its component parts would need to be transparently priced (likely with the BIS as pricing agent) and actively traded. If severe capital controls are imposed, it may make sense to exclude a certain currency from the ECU-2 basket for operational reasons, similarly to how certain currencies were excluded from the original ECU basket.

Expected FX rates for new national currencies

Turning to the potential value of the ECU-2, we will rely on the initial estimates of new national currencies we have published separately (see Currency risk in a eurozone break-up: Valuing potential new national currencies - December 5, 2011 of Figure 17 of this document). We note that these estimates are based on a simple, two-factor framework, and should be viewed as longer-term equilibrium estimates, rather than an attempt to predict where currencies would trade immediately following a break-up. All estimates are expressed versus the USD.

Fig. 22: Fair value estimates of a potential ECU-2

ECU-2 fair value estimation					
	ECB Weights (A)	Baseline ECU-2 weights (B)	ECU-2 weights (ex. Greece) (C)	ECU-2 weights (ex. Greece, Ireland, Portugal) (D)	Fairvalue in breakup (E)
Belgium	2.4%	3.5%	3.7%	3.8%	1.02
Germany	18.9%	27.7%	28.5%	29.8%	1.36
Greece	2.0%	2.9%	0.0%	0.0%	0.57
Spain	8.3%	12.1%	12.5%	13.1%	0.86
France	14.2%	20.8%	21.4%	22.4%	1.21
Ireland	1.1%	1.6%	1.7%	0.0%	0.96
Italy	12.5%	18.3%	18.8%	19.7%	0.97
Netherlands	4.0%	5.8%	6.0%	6.3%	1.25
Portugal	1.8%	2.6%	2.6%	0.0%	0.71
Austria	1.9%	2.8%	2.9%	3.1%	1.25
Finland	1.3%	1.8%	1.9%	2.0%	1.25
ECU-2 calculations	-	Sum (B * E)	Sum (C * E)	Sum (D * E)	-
ECU-2 valuation	-	**1.13**	**1.14**	**1.16**	-

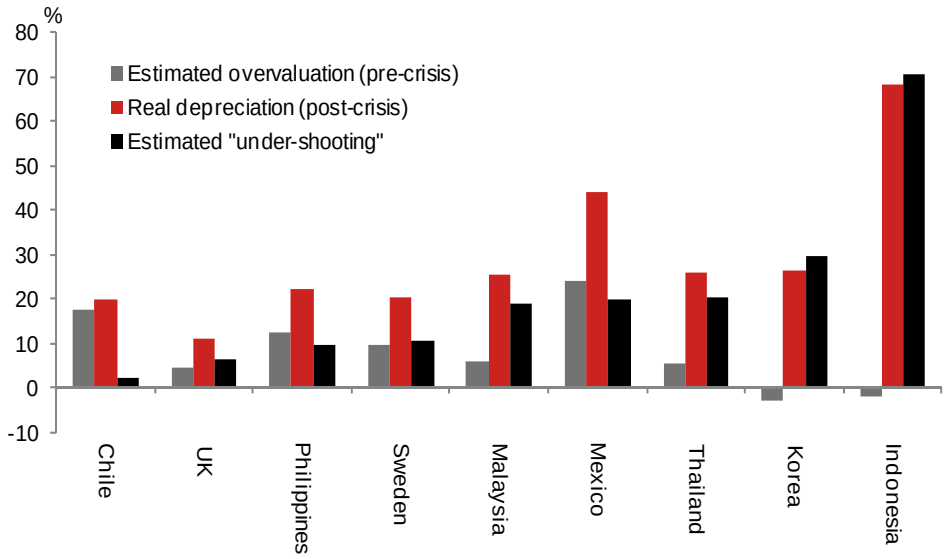
Note: ECU fair values are expressed in ECU/USD terms. Source: Nomura, ECB

Figure 22 shows potential ECU-2 valuation of 1.13 (USD per ECU-2) in our baseline case where all current eurozone countries, except the smallest ones, have a weight in the ECU basket. The estimate rises to 1.16 (USD per ECU-2) if Greece, Ireland, and Portugal are excluded. The estimate is higher since these countries' currencies are expected to be particularly weak in a break-up scenario. But the size of the difference is small given their small weight in the basket in the baseline case. The range of estimates 1.13-1.16 is well within the range where the euro has been trading versus the dollar since inception, and from a longer-term perspective, these estimates may be reasonable. However, one should expect potentially significant under-shooting of individual new national currencies and the ECU-2 basket in the immediate aftermath of a break-up.

There is a large academic literature on currency 'undershooting' in connection with currency crises[7]. Without going into detail, we think the same type of mechanics would apply in a eurozone currency crisis, certainly for a number of the currencies in the ECU basket. Figure 2 below, derived from an IMF study by Baig and Goldfajn[8], illustrates the magnitude of the 'undershooting' effect in certain historical currency crisis.

The historical examples highlighted here indicate an "average" undershooting effect of 21% in past currency crises. Whether this magnitude of an undershooting effect would be appropriate for eurozone countries as well would depend on an evaluation of country-specific parameters, such as external reserves, default risk, political stability, and net foreign asset positions, among others. How these effects interact with long-term inflation risk is likely to depend on country-specific dynamics, but that analysis will require another paper.

Fig. 23: Depreciation and "under-shooting" in past currency crises



Source: Nomura, IMF

[7] For example, see Cavallo, Michele, Kate Kisselev, Fabrizio Perri, and Nouriel Roubini. "Exchange rate overshooting and the costs of floating." Federal Reserve Bank of San Francisco Working Paper. May 2005.
[8] Baig, Taimur and Goldfajn, Ilan. "Monetary Policy in the Aftermath of Currency Crises: The Case of Asia." International Monetary Fund. December 1998.

Changing eurozone capital flows

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The Euro weakened meaningfully in H2 2011 as the European debt crisis escalated and tensions migrated from the smaller peripheral countries (Greece, Ireland and Portugal) towards Italy, Spain and even France. This escalation of the crisis and increasing fear of a eurozone break-up have been accompanied by a clear shift in cross-border capital flow dynamics. Specifically, foreign demand for eurozone debt instruments has waned, and significant liquidation of Belgian and Italian debt holdings has started.

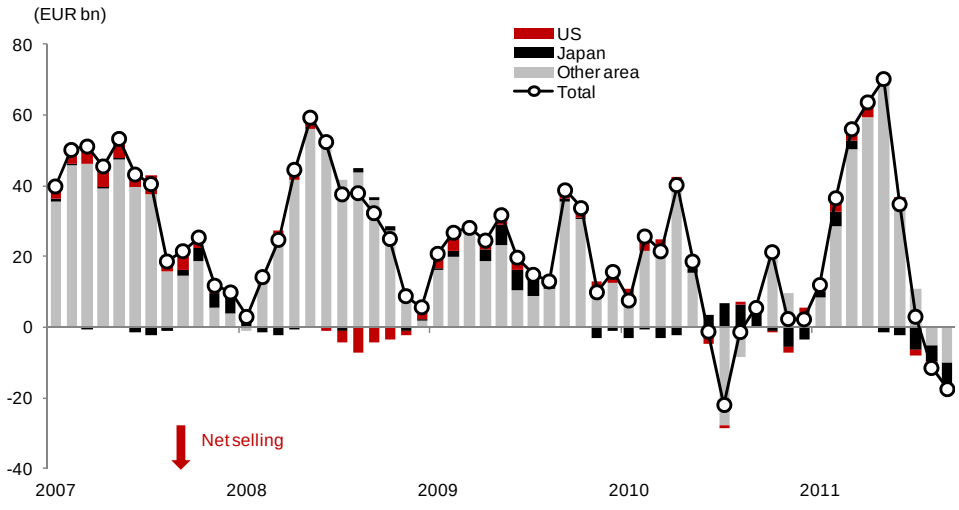
In the July to October period, foreign investors sold eurozone fixed income instruments to the tune of EUR88bn, or EUR264bn annualized. This compares to an inflow of EUR320bn in H1, or EUR641bn annualized, and is a very large swing (see Figure 24).

From an asset allocation perspective, the key take-away is that only a small part of the eurozone bond market continues to trade as a risk-free asset. Downgrades have hit Italian and Spanish bonds, and all major rating agencies have recently warned that France could see its AAA rating put in question. S&P warned it may downgrade 15 eurozone countries and the EFSF in the near future. More generally, there is now a certain type of stigma associated with European exposures, making it more difficult for US banks to hold such exposures.

These factors point to a more structural form of weakness, which is less likely to be impacted by short-term changes in risk sentiment. The fact that weakness in inflows has persisted over the July-October period, through ups and downs in risk assets, supports this notion.

Importantly, investors are no longer substituting from the periphery to the core. This was the case in 2010, when weakness in the periphery tended to generate additional demand for German and French bonds. But in the second half of 2011, there has been no evidence of a substitution effect. In fact, foreign sales appear to be broad-based, including the core.

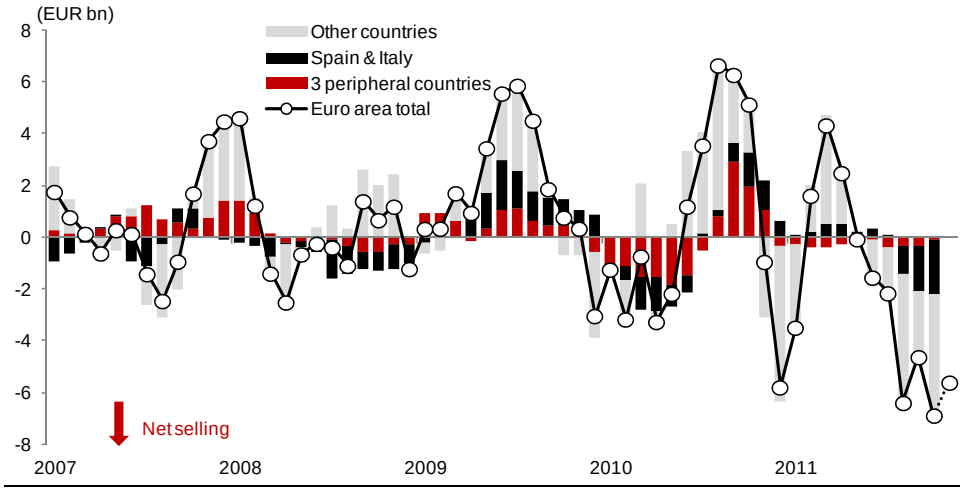
Fig. 24: Fixed income investment into eurozone (monthly by region of investors)



Note: 3 month moving average. Source: Nomura, Bloomberg, MOF, US Treasury.

Investment in eurozone assets has slowed, both from private and official investors. Private investors in Japan, for example, were large net-sellers of eurozone fixed income assets during August – October (see Figure 25). Global central banks accumulated less reserves than normal, and we judge that flows into eurozone fixed income from this source also moderated. Our tracking of reserve trends clearly slowed since August. We estimate global EM central banks accumulated just USD245.7bn of reserves in H2 2011, compared to USD573.0bn in H1 2011.

Fig. 25: Japanese investment in eurozone fixed income (periphery, Spain/Italy, and core)



Note: Monthly figures calculated as 3-month moving average. November figure is Nomura estimate. Source: Nomura, MOF, Bloomberg.

Rising volatility poses challenges for EUR asset allocation

From a fundamental perspective, the elevated concern about the future of the Euro should warrant a negative risk premia on eurozone assets in general, including the Euro. But this argument could have been made since early 2010, and nevertheless the Euro has traded resiliently for most of the time.

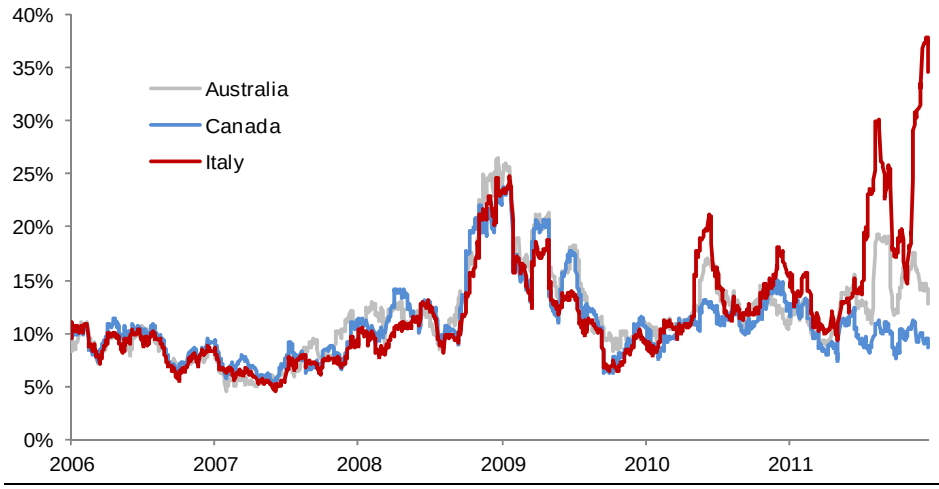
However, there is a new element in the equation from a portfolio management perspective: The market risk associated with holding unhedged eurozone fixed income positions has spiked since summer in 2011, including in eurozone bond markets which were up to recently perceived as ‘essentially risk-free’.

Figure 26 shows the realized 30-day volatility of returns on positions in Italian bonds with a 7-10year duration with no currency hedge, from USD and JPY-based investors’ perspective.

This spike in volatility of returns has to do with the widening spread on those bonds, but also with the fact that the Euro is negatively correlated with those spreads (bond prices are positively correlated to the Euro). This means that volatility in bonds is amplified by currency movement. In the past, the correlation was different and often had a dampening effect on total return volatility within G10 fixed income (when bonds where trading as risk free assets).

Importantly, volatility in Italian bonds for foreign investors now exceeds the volatility in Australian and Canadian bonds (Figure 26). In the past, Australian and Canadian bond holdings tended to have mor volatile returns. However, Italian bonds are now far more volatile than Australian and Canadian bonds currently. While volatility is not the only measure of risk, credit risk in Italian bonds is also much higher. Unless the eurozone authorities are able to stabilize bond markets, foreign investment in eurozone bond markets is likely to remain low or investors may continue to sell, in our view.

Fig. 26: Volatilities of Italian, Australian, Canadian bonds in USD terms (30days)



Note: Volatility is calculated based on daily returns, 30-days rolling window. Total return index based on 7-10 years maturities. *Source: Nomura, Bloomberg*

How much is left to sell?

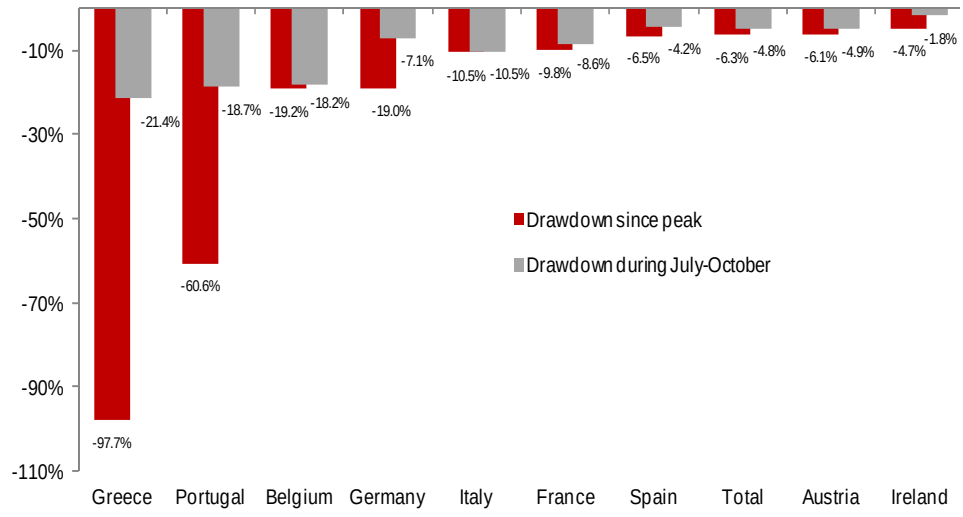
We have shown that foreign investors have acclerated their liquidation of eurozone assets in recent months.

Japanese investors sold almost all Greece bonds (98%) and most of Portuguese bonds (61%) by October, while they sold only 10.5% of Italian bonds. Overall, Japanese total exposures in eurozone bonds have declined by 6.3% since its peak.

In fact, in just the four months since July, Japanse investors sold nearly 20% of Belgian bonds and more than 10% of Italian bonds (Figure 27). Japanese are estimated to have liquidated 7.1% of German bonds and 8.6% of French bonds in four months. Note that the entire liquidation from the peak of Italian and French bonds has happened over the last four months.

Against this background, it is now relevant to think about the implications of a scenario where foreign investors start to liquidate eurozone assets on a broader

Fig. 27: Japanese estimated drawdown of eurozone bonds



Source: Nomura, IMF, MOF

scale. To evaluate the possible impact of large scale selling of eurozone assets by foreign investors, we compiled estimates of outstanding eurozone assets held outside the region.

The upper part of Figure 28 shows current foreign holdings of eurozone debt:

- Current external holdings of eurozone debt amount to about EUR 4tn.
- German and French bonds account for almost EUR 2.5tn.
- Japanese exposures in eurozone bonds amount to around EUR 500bn and exceed US exposure of around EUR 400bn. Additionally, 45% of Japanese investment is estimated to be in Germany and France.

Overall, these results suggest there is still room for foreign selling of eurozone assets in 2012 in the absence of a clear improvement in eurozone fiscal/financial problems. We think a 25% liquidation scenario is worth thinking about for the following reasons:

First, both US and Japanese investors sold some peripheral bonds on a large scale (50-100%), hence assuming a more conservative 25% liquidation of eurozone bonds may be reasonable if we see further deterioration in eurozone bonds market dynamics. Second, the pace of sales in Italian and French bonds by Japanese investors since August suggests monthly drawdown of 2-5%, which could be extrapolated to 12-30% over a 6 month horizon.

In the lower part of Figure 28, we have calculated the flow resulting from a 25% liquidation of eurozone fixed income assets by foreign investors:

- Total private eurozone bond selling is estimated to reach EUR 544bn of which EUR119bn is from Japanese investors and EUR94bn is from US investors. Even after excluding German bond exposures, total selling would amount to EUR416bn.
- It is not clear how reserve managers trade when they see large private selling of eurozone assets. However, in the extreme case where they follow private investors, the impact would double to around EUR 1tn.

These numbers are clearly very large, and the lack of market liquidity makes it hard to liquidate in this size. However, we think this is still a scenario to consider seriously to gauge potential selling pressure.

Fig. 28: Estimated outstanding eurozone assets held outside Eurozone and possible liquidation (EUR billion)

			Germany	France	Luxembourg	Netherlands	Italy	Ireland	Spain	Belgium	Austria	Finland	Portugal	Greece	Total	Total (excl. Germany)
Outstanding (stock)	Total assets held outside Eurozone	Equity	306	310	319	170	81	195	91	34	19	56	8	8	**1,602**	**1,296**
		Debts	1,274	1,060	243	525	266	189	176	106	113	82	18	14	**4,075**	**2,802**
	held by Japanese	Equity	15	18	13	7	4	6	5	2	1	2	0	0	**72**	**57**
		Debts	116	94	66	65	48	34	19	11	12	10	2	0	**477**	**360**
	held by US	Equity	155	185	26	92	39	78	49	22	9	21	4	5	**684**	**529**
		Debts	37	78	80	76	(0)	35	8	45	(0)	12	5	0	**376**	**339**
	held by other area	Equity	131	101	280	69	34	110	36	10	9	33	4	3	**823**	**692**
		Debts	358	268	91	223	132	100	78	(13)	45	25	5	11	**1,330**	**972**
	Total private	Equity	301	304	319	167	77	195	89	34	19	55	8	8	**1,579**	**1,278**
		Debts	511	439	237	364	180	169	106	42	57	47	11	12	**2,183**	**1,672**
	Reserve money	Equity	6	7	0	2	4	0	2	1	0	1	0	0	**23**	**17**
		Debts	762	620	6	162	87	20	70	64	56	36	7	2	**1,892**	**1,130**
			Germany	**France**	**Luxembourg**	**Netherlands**	**Italy**	**Ireland**	**Spain**	**Belgium**	**Austria**	**Finland**	**Portugal**	**Greece**	**Total**	**Total (excl. Germany)**
25% liquidation (flow)	Flow by Japanese	Equity	4	4	3	2	1	2	1	0	0	0	0	0	**18**	**14**
		Debts	29	23	16	16	12	8	5	3	3	3	1	0	**119**	**90**
	Flow by US	Equity	39	46	6	23	10	20	12	5	2	5	1	1	**171**	**132**
		Debts	9	20	20	19	(0)	9	2	11	(0)	3	1	0	**94**	**85**
	Flow by other area	Equity	33	25	70	17	9	28	9	3	2	8	1	1	**205**	**172**
		Debts	89	67	23	56	33	25	20	(3)	11	6	1	3	**331**	**241**
	Total private flow	Equity	75	76	80	42	19	49	22	8	5	14	2	2	**394**	**319**
		Debts	128	110	59	91	45	42	26	11	14	12	3	3	**544**	**416**
	Reserve money	Equity	1	2	0	1	1	0	0	0	0	0	0	0	**6**	**4**
		Debts	191	155	2	40	22	5	18	16	14	9	2	0	**473**	**283**

Note: EUR billion. Japanese and US data are our estimate using MOF monthly flow data and TIC, as of end-September. Total and other area are data from IMF as of end-2010. Reserve money is based on IMF data and we multiplied them by about 1.8 to consider unallocated reserve. Total urozone exposure includes five small countries. Source: Nomura, IMF, MOF, US Treasury, ECB.

Eurozone break-up trades

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In this chapter, we look at potential trades (hedges or outright position) in the case of a eurozone breakup. We focus on a number of ways of expressing a breakup via bonds, futures, basis trades, CDS, and FX. These trades include long German treasury bills, long German treasury bills on repo, and long KFW. We also like to be short EFSF bonds and short local law bonds versus foreign law bonds in high quality (non-German) names, although liquidity is an issue. Finally, short EUR positions versus other major currencies (USD, JPY and CNY) should perform well on a path towards a eurozone break-up, although there may be uncertainty about the settlement process in a full-blown disorderly break-up.

We premise these trades on the assumption: that Germany's relative economic strength vs. the rest of the eurozone continues and that the introduction of DEM would significantly appreciate vs. other European currencies whether there remains a euro or they impose an ECU-2..

Long Schatz on balance sheet

The sequence of events that leads to a breakup event is likely to be somewhat disorderly, with a rapid flight to quality assets ensuing, particularly those with short maturities. In the event of a eurozone break-up, we would see flight to quality flows into AAA countries, with Germany likely to be the key beneficiary due to the depth of its financial markets. An immediate trade with relatively lower downside risk is to buy the Schatz. Of course the corresponding trade for peripherals would be short (local law) peripheral bonds, with repos documented under GMRA or MRA benefitting from devaluation of the new peripheral currency.

In a full-blown break-up, Germany would likely introduce its own currency (which we call DEM for the purposes of this note) via an act of parliament. *Lex Monetae*, the internationally recognized right of a government to introduce its own currency, as applied in the case of Germany would naturally allow the government to introduce the DEM as legal tender, meaning that all liabilities including trade settlement, taxes, debt are payable in DEM. Schätze instruments are issued by Bundesrepublik Deutschland – Finanzagentur GmbH (a German legal entity based in Frankfurt/Main) and is governed by local law.

Furthermore following issuance the notes are listed for regulated market at the German stock exchanges (Berliner Börse, Börse Hamburg-Hannover, Frankfurt Stock Exchange, Börse München, Börse Stuttgart) meaning that the location of obligor and place of payment is Germany.

While it is not altogether certain that Germany would choose to redenominate all its old obligations into the new DEM if there still is a euro or an ECU substitute, a new currency law establishing legal tender, would likely redenominate **all** local law obligations in the new DEM. While there is the possibility of carving out some portion of old debt from redenomination, we believe this scenario as unlikely. Meanwhile, bank deposits would largely redenominate into DEM, making for possibly banking asset-liability mismatches.

Moreover, any currency law which distinguishes between old and new obligations in a seemingly arbitrary way does run the risk of not being recognized by courts internationally. This could invalidate any redenomination by English and NY courts and the application of principles of Lex Monetae. We think this slice-and-dice method is therefore rather unlikely.

The actual gain on holding Schatz on balance sheet depends on a firm‘s means of financing itself. If euro-based financing does not automatically redenominate (i.e., in most cases, say, except for say German firms which borrow under German law), then the DEM asset is expected to make significant gains against the EUR liability, and this should remain the case if the EUR liability is redenominated into ECU-2.

Alternatively, although far less liquid, buying out of the money call options on Schatz (typically documented under ISDA) would be a method for going long the same risk but moderate some of the downside.

Long Schatz on Repo

While outright Schatz trades may depend on an investor’s ability to fund the trade and hold it on balance sheet, a similar but somewhat more straightforward trade is to buy Schatz on repo. Essentially the investor buys Schatz, and subject to any haircut (margin) amount, receives the price from the repo counterparty.

According to GMRA or MRA, a repo is merely a secured loan on a fixed amount of bonds (e.g., a repo on EUR 200mn notional of Schatz), and cross currency repos (where assets and repo notional are in differing currencies) are always possible. There is no means for re-denominating the principal of the loan even when the collateral changes denomination. Consequently, if the Schatz is redenominated into DEM the investor still owes EUR on the cash leg. If after redenomination, there is a gain on the Schatz mark-to-market, the repo counterparty will be forced to pay more euro to cover margin (which will then have to be reinvested). Upon closing the trade, the investor receives a DEM asset and closes the EUR liability.

This trade may involve extra legal hurdles on insolvency, due to the fact that the repo counterparty holds title to the underlying Schatz. But, in the event of an insolvency, this is termed a default event and both legs of the repo (and all other repos with the same counterparty) are valued (according to the valuation methodology in the English law GMRA or New York law MRA) and a net figure will be determined. This then leads to a single figure which must be paid on unwind by the investor to the failed repo counterparty or vice-versa. So, while title transfer may prove more legally delicate, standard master agreements do have provisions involving default and netting, which make this trade much more straightforward giving all the economic benefit of a leveraged long in Schatz. On the other hand, GC Repos in place with LCH/Repoclear will face far less counterparty risk due to the exchange‘s rules on margining. What is less clear though is the benefit that one could obtain repoing through the exchange. In particular, as is true of other exchanges, although transactions are documented by English law (see link), if the exchange determines it appropriate to change the rules on outstanding transactions (e.g., to re-denominate repo notionals at the same time the Schatz re-denominates), it can ask members to sign up to this retroactive rule change. Members will willingly do so to ensure that they remain members of the exchange going forward.

Repos are usually documented under GMRA or MRA master agreements but may be documented under German law DRV (Rahmenvertrag für Finanztermingeschäfte) and we note as well that redenomination of the loan principal is much more likely for repos documented under German law.

Long Schatz on ASW

Asset swaps, although initially tied to a given bond and effectively transforming the fixed coupon of a Schatz into a floating (Euribor-Spread or EONIA+Spread) instrument, are documented under standard ISDA agreements (or other swap master agreements) and are merely off-market fixed-floating swap.

Consequently, the swap itself may require variation margin due to mark-to-market, but there is no recourse to the (initially referenced) Schatz. Consequently, it is straightforward to own a Schatz (on balance sheet or on repo) and enter into a separate ASW contract. The ASW contract, like other swaps, is likely to remain in EUR if documented under New York or English law (with some possible variation feasible if it is documented under Spanish, French or German law). One benefit of paying swaps is the likelihood of EURIBOR spikes due to bank funding concerns in any move towards exit or breakup.

Long Schatz (DU) Futures, Long Calls on Schatz Futures, Short BTP Futures

Schatz futures (DU) trade on the Eurex exchange and are documented under German Law. The various voluminous master agreements allow initial margins to be posted in CHF, EUR, GBP and USD, with variation in the same currency, for a variety of different underlyings, some for physical delivery, some for cash-settle. Being documented under German law and trading on an exchange in Frankfurt, it is relatively clear that Eurex futures contracts will be redenominated into DEM . Meanwhile, upon redenomination, margin amounts, which are held in cash are also likely to be redenominated into DEM.

For DU, this means that any redenomination is likely to have little to no effect whatsoever. For underlying asset re-denominates, the margin will also re-denominate. Meanwhile, upon delivery, the long is required to pay the (factor-adjusted) futures-price in DEM for a DEM-denominated Schatz. In all likelihood, the DU contract is a complete wash in terms of re-denomination risk. And similarly, going long calls on DU will not benefit at all from re-denomination, as the futures price itself is unlikely to be greatly affected by re-denomination. In fact, as we argue below, the future may even trade down on a re-denomination, especially if buying pressure pre-DEM came from non-German domiciled institutions.

A somewhat more interesting trade could be going short the BTP futures. In the event of a re-denomination, the BTP will be denominated in ITL, while settlement in Eurex may remain in EUR or in DEM. Consequently, upon re-denomination, the contract effectively turns into a ITL-DEM forward trade. One negative of this trade is it may be feasible for Eurex to change the terms of business (which will have to be accepted by all exchange members if they wish to continue to trade with the exchange), which will either retroactively alter the terms of existing trades, or alter all future trades, or terminate and cash settle all existing trades. Consequently, if a re-denomination event is particularly disruptive to Eurex, it may be possible that any viable benefit (particularly from the short BTP futures trade) will be made far less certain, and the most likely end product would be to have BTP futures being denominated (and re-margined) in ITL, again making the trade a wash.

Schatz Basis Trades (Long Schatz, Short Schatz Futures)

As we have said above, the sequence of events that leads to a breakup is likely to raise the bid for shorter dated quality assets. Both Schatz and Schatz futures are likely to be well bid through this period, but we think that the domicile of the investor base along with currency re-denomination could lead to a sharp preference in cash over the future as the future expiry nears. This is due partly to the fact that a re-denomination event will possibly benefit the bond holder without passing on any undue benefit to the long futures position.

To position for this one buys the CTD on the Schatz contract, which given the Finanzagentur‘s issuance schedule is the on the run Schatz, and sell the Schatz future (DU) against this. The position is effectively a basis trade.

This demand for quality collateral and resultant difficulty in locating the CTD as well as tightness in funding markets could also cause a repo squeeze, which should positively affect both the cash and Futures positions.

The main consideration for the long futures positions comes at contract expiry, where any holders who do not roll out, will likely be required to buy DEM in order to complete the purchase of the CTD. If the investor is domiciled in a country which does not use DEM as legal tender, the exchange rate differential is likely to make receiving/purchasing the underlying relatively more costly. This additional cost and/or the fear that there is potential for this to occur could in fact drive down the Futures price.

Holding this structure the investor could choose to deliver the bond into the future and exit, with the DEM cash differential or choose to close the short futures position prior to expiry and be left holding the DEM Schatz. Bonds at the front end of the German curve are currently rolling to negative yields, which should be of benefit to cash investors while this general risk-averse outlook persists. Owning the bond outright avoids any counterparty issues, with the futures position margin posting as the exchange also offers additional to adverse events.

Long KfW

KfW has recently begun repricing (although not completely in synch with repricing of the remainder of the SSA asset class). Given the explicit and direct guarantee of the Federal Republic of Germany for KfW Bankengruppe (see link) under German law from 1948, later amended in 1969, KfW retains the full faith and credit of the German republic. According to the Anstaltslast, Germany must keep KfW in a position to pursue its obligations through allocation of funds as need be. The German banking regulator, BaFin has given it a risk weighting equivalent to that of Bunds (see link), and consequently, a long in KfW, will similarly benefit from re-denomination in DEM. We note however that KfW has a multiplicity of funding instruments and some are issued under English and New York law and would likely remain in EUR (or in ECU) and may not benefit from re-denomination.

One downside to holding KfW is the illiquidity and its recent underperformance. While KfW has not underperformed nearly as much as other eurozone SSAs, its recent widening subsequent to the failed Bund auction does underscore some of the market-perception of the risk in holding this asset, and consequently, going long KfW is only recommended for those who do not have tight stops. An alternative would be to go long a German law and short a similar maturity English law KfW bond, with the hope of owning a DEM-denominated asset and being short a EUR-denominated asset, liquidity provided.

Buying Sovereign CDS Protection

Sovereign CDS triggers in the event of re-denomination, but not if the re-denomination of the sovereign obligation is into:

1. the legal tender of any Group of 7 country (or any country that becomes a member of the Group of 7 if such Group of 7 expands its membership)
2. the legal tender of any country which, as of the date of such change, is a member of the Organization for Economic Cooperation and Development and has local currency long-term debt rating of either AAA or higher assigned to it by Standard & Poor‘s, Aaa or higher assigned to it by Moody‘s Investors Service, or AAA or higher assigned to it by Fitch Ratings.

Group of 7 isn't defined in the ISDA documentation (and cannot expand its membership according to most definitions of "G7" and linguistic interpretations of the number "7", see e.g., link), but ultimately it would be up to the ISDA Determination Committee to decide if there was a Restructuring Credit Event and they would have to decide whether a country was a G7 country. It isn't reviewed per se, it would be looked at the relevant time the question of whether a Restructuring Credit Event had occurred was put before the ISDA DC. Similarly, OECD membership would be looked at as at the date of the restructuring by the ISDA DC as well, but presumably countries cannot be expelled.

Based on the above definitions, it is clear that Germany, France and Italy can re-denominate without triggering based on being part of G7, while Netherlands, Finland, Luxembourg, and Austria are AAA OECD countries and similarly would not trigger, although the possibility of a downgrade would leave Austria more at risk and may make payout far less certain. Similarly, in some extreme event of Ireland seeking to join a currency union with the UK (G7, see Niall Ferguson, 2021: the New Europe), this too would not trigger CDS.

Irrespective of the vagaries of individual re-denominations the process of any exit or breakup could come with plenty of other reasons for CDS to trigger based on restructuring events, moratoria, or failures to pay and there would be relatively few countries which we would recommend paying protection. On the other hand, purely from a re-denomination vantage, it would make sense to buy protection in Spain, Portugal, Ireland, Belgium, and of course Greece.

Sell (and if possible go short) EFSF

The EFSF has come under considerable pressure due to concerns over AAA guarantor countries retaining their ratings, the frequently changing mandate of the EFSF, the complexities of its structure, as well as the repricing of the entire SSA asset class. While we have previously mentioned the EFSF has a great many positives including the irrevocable nature of the English law guarantees issued by the eurozone sovereign countries, which are technically (de facto) senior to local market bonds[9] there are many reasons why this is not considered credible by the market (see e.g. The CDO at the heart of the eurozone, EFSF Revisited, European Financial Stability Facility where we touch on a number of concerns), and the guarantees are treated as less valuable than local market bond obligations. Certainly changing the EFSF into a CDO backed by Bunds, OATs, Dutch Bonds, BTPs, SPGBs would at least give the confidence that investors would have access to pari passu obligations of the different states. But changes to the EFSF are not easily undertaken at this time.

In fact the primary concern over EFSF is the nature of the guarantees. If there was a euro, each guarantee (for a specific euro obligation) would not easily be redenominated. But, in the event of complete breakup, each guarantee could arguably be considered to be in the local currency. Presumably, DEM and NLG guarantees would be far more valuable than say ITL and ESP and the complication of having guarantors approached on a pro rata basis is hard to imagine, let alone the inter-guarantor obligations documented in the Framework Agreement. Given the relative intractability of the basket of differing currency guarantees, this raises the probability of non-payment rather dramatically. While it would be a relatively easy for Germany or France to make whole their currently small obligations on outstanding EFSF bonds, should only one AAA sovereign attempt to renege on its guarantees, it could default the bonds. Meanwhile, the serious funding stresses that Italy and Spain (both guarantors), and the AAAs themselves could experience during a breakup, together with questions as to the nature of the collateral in the AAA cash-buffer make EFSF a relatively

[9] The English Law guarantee is irrevocable, there is a waiver of sovereign immunity, judgment can be pursued in an English court. In effect, it has many more provisions than any local law government bond.

straightforward short recommendation. In fact, many clients have sought to short EFSF throughout the crisis and in many cases will go long EFSM (EU or EEC bonds) as a switch, given the fact that they are backed by the EU budget (which we note historically was ECU denominated) and joint and several obligations by EU members according to the Treaty. There may be some hope that in the event of a break-up EFSM/EU/EEC bonds, historically among the first ECU denominated instruments, once again revert to their historical ECU basis. This is not easy to determine from a legal stand-point, but a possibility to consider.

While EFSF has underperformed during the past few months with widening of between 60-70bp in ASW, the momentum can of course be furthered given market concerns over exit or breakup. In terms of SSA space, an asset allocation from EFSF into KfW would be of particular benefit to investors concerned about euro breakup.

Short the Euro versus other major currencies

We have been on a path of clear Euro underperformance versus the USD, JPY and CNY since August, and we think this underperformance is likely to be sustained in a scenario where break-up risk is increasing. This view is linked to i) clear growth underperformance as a function of financial instability, ii) rising risk premia linked to risk of sovereign default and redenomination risk, and iii) structural capital flow weakness, especially in relation to inflows into sovereign and bank debt (see FX after ECB: Taking stock, 8 December 2011).

How the Euro performs versus other currencies, including EM and commodity currencies, will likely be a function of the force from banking sector deleveraging and global growth dynamics. It is less clear to us that there is a strategic trade in this space, although there may be more tactical opportunities from time to time.

These views relate to how the Euro would trade on the path to a break-up, not in the break-up itself. At the time of break-up, the specific nature of the Euro exposure and the nature of the break-up will determine how redenomination will take place.

In a situation where EUR contracts are redenominated into new ECU, according to an EU directive, short EUR positions (such as those implemented through FX forwards) will be settled in relation to the market value of the new ECU, which is likely to be substantially weaker than the Euro's current value (we have estimated fair value around 1.15 versus the dollar). But in the absence of an EU directive, there will be legal uncertainty about how to settle such short positions, and the specific outcome may depend on the legal jurisdiction (foreign or local to the eurozone) underlying the position (spot, forward or option based).

There is currently no market for non-deliverable forwards (NDFs) for local currencies of countries currently in the eurozone. But as banks, investors and corporations become increasingly aware of redenomination risk, it would be natural for an NDF market to develop in order for counterparties to transfer and mitigate some of the underlying risk. The contract would be relatively simple. In the case of a German USD NDF, it would pay the legal currency of Germany versus the USD, being EURUSD should there be no redenomination event, and settlement based on the official DEMUSD rate (paid in USD alone) should there be a redenomination event.

Conclusion

The eurozone in 2012 and Beyond

A break-up of the eurozone is not our central case. But a limited break-up, likely involving Greece, is a high risk. Moreover, the risk of a full-blown break-up scenario is no longer negligible, and it will rise further as long as European policymakers fail to bring key sovereign bond yields back to sustainable levels.

A break-up scenario is clearly negative for eurozone assets in our view, as the process is likely to involve significant sovereign defaults and will be disruptive to economic growth in the region. Importantly, we only view two types of break-up scenarios as realistically possible:

First, a very limited break-up where one or a few smaller countries leave is a possibility. This scenario could result from a breakdown in the political process around fiscal austerity in the periphery, making it impossible for the EU and the IMF to disburse additional tranches of financing. In this type of break-up scenario, concerns about the sustainability of the eurozone would likely persist, and contagion effects to remaining peripheral countries could be severe for some time. This is especially the case if the European and global backstop infrastructure have not been bolstered significantly ahead of the event.

Second, a full-blown 'big bang' break-up scenario is also becoming a distinct possibility. The typical argument against this scenario is that 'policy makers would never allow it'. But policy makers have already allowed the crisis to spread much further than initially feared. Moreover, the high implied default probability in Italian bond and CDS markets (around 30% for 5-year contacts) suggests that this possibility has to be taken seriously.

How the risk of a break-up evolves from here and how risk premia on eurozone assets and the Euro behave is likely to depend on a number of macroeconomic and political parameters:

Fiscal performance in the eurozone, and especially in the larger countries now in the limelight, will be key to market sentiment and systemic stability. Against this background, budget performance and political developments in Italy and France will be very important.

Growth in the eurozone has suffered from financial market instability and deleveraging in the banking system in the final part of 2011. How regulators behave is likely to play a key role in relation to deleveraging, credit and growth dynamics in the eurozone in 2012.

Capital flows dynamics in and out of the eurozone have started to change. Foreign investors have begun to significantly reduce positions in sovereign bond markets, creating negative implications for sovereign debt service cost and for the Euro. Whether foreign investors, potentially including central banks, will accelerate the liquidation process and whether eurozone investors will start to shift capital abroad (in a capital flight dynamic similar to what is typically observed in emerging markets) will play a key role both in relation to asset prices and in relation to debt sustainability.

ECB policy has so far failed to generate any positive confidence effects, although the recent 3-year financing operation did provide a significant boost to liquidity in the system. The 'missing bazooka' effect played an important role in the continued deterioration in market condition in H2 2011. Whether the ECB will turn more forceful, including opening the door to more asset purchases, is likely to be an important determinant for future path for the eurozone.

European leaders took a step towards **fiscal union** at the December 2011 summit. But the step was a relatively small one, based largely on more severe budgetary restriction, rather than any transfer mechanism. Whether European

leaders move in the direction of a transfer scheme, which can boost the changes of successful austerity programs, will be important to the future of the eurozone. Meanwhile, the political process entails risks, especially if a referendum is needed as part of the ratification process in one or more countries.

The outlook for the eurozone is highly uncertain. European policy makers face a very challenging set of circumstances, given internal imbalances, weak growth, tension in the banking system, and unsustainably high bond yields in a handful of countries. There is little doubt that the risk of a break-up in some form has risen over the past six months: We cannot take for granted that policy makers will manage to quickly guide the eurozone to a stable new equilibrium.

Since the risk of a eurozone break-up is no longer negligible, investors will have to account for break-up and redenomination when evaluating the risks associated with eurozone exposures within their portfolios. This is something new, and it is likely to have an important influence on sentiment and capital flows for some time, even if the worst break-up scenarios are ultimately avoided.

Risk premia associated with break-up and redenomination risks are likely to play an important role in eurozone asset performance in 2012 and beyond. As such, the analysis of these new risk factors for the eurozone will continue to feature prominently in our analysis of eurozone fixed income markets and in relation to our strategy views on the Euro.

Disclosure Appendix A-1

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