

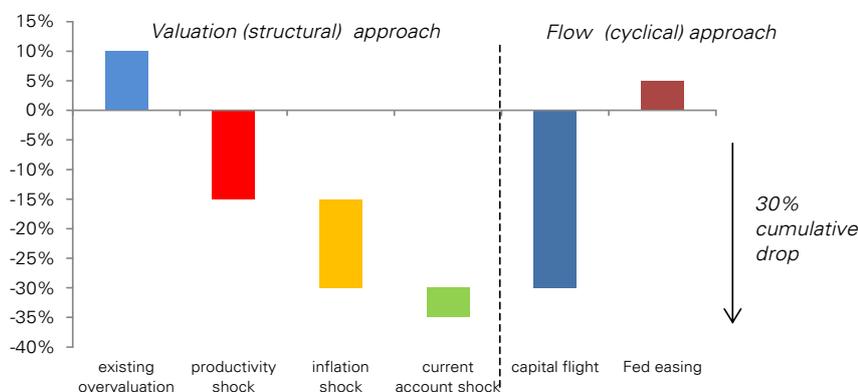


Understanding Eurozone break-up: how much would the euro drop?

- In this piece we analyze how much the euro and its legacy currencies would weaken in the event of a Eurozone break-up. Under conservative assumptions we calculate that EUR/USD would fall by 25-30% to 80-75cents just before break-up. Some legacy currencies could fall by an additional 40% after the event.
- The defining event of a Eurozone break-up would be a capping or outright suspension of cross-border Target 2 payments. However, the ECB would be unlikely to do this without political validation.
- Four things would drive the euro and its legacy currencies in the event of a break-up. First, the need to correct existing valuation misalignments. We find these to be small. Second, large-scale capital flight as the euro loses its reserve status. Third, a large negative productivity shock across the Euro-area. Fourth, a large negative productivity shock across the Euro-area. Fourth, a large inflation shock in the periphery as central bank credibility is lost. The euro's only silver lining is that the Fed has much greater space than the ECB to ease monetary policy. This would offset part of euro weakness.
- Using a capital flows approach we argue that EUR/USD would drop by 30% pre-breakup assuming reserve re-allocation. Our assumption is very conservative because we don't assume private capital flight. Using an alternative valuation framework we estimate that the euro's fair value would decline by a similar 30% to account for negative productivity and inflation shocks. A powerful Fed response could provide an offset of 5-10%.
- Even though some legacy currencies such as the Deutschmark could end up appreciating after break-up, it is unlikely the cumulative effect of break-up is positive. All currencies would end up weakening versus current "shadow" exchange rates against the dollar. This would range from 15% in Germany to 70% in Portugal. Our estimates are highly sensitive to the degree of capital outflows as well as to the size of the productivity and inflation shocks that materialize.

The French spring Presidential and June legislative elections are the next political event attracting investors' attention. Today, we have published our in-depth analysis of this topic and its likely impact on the [Economic & political scenarios](#), [FX](#), [government bonds](#), [French banks](#), [equities](#), [equity derivative](#) and an [executive summary](#) in seven related articles.

Figure 1: Impact of Eurozone breakup on EUR/USD



Source: Deutsche Bank

Accompanying documents French election:

- [Executive summary](#)
- [Economic & political scenarios](#)
- [Government bonds](#)
- [French banks](#)
- [Equities](#)
- [Equity derivatives](#)



Introduction

A Eurozone break-up is likely to be one of the largest financial and economic shocks in modern history. In earlier work¹ we demonstrated that there is plenty of historical experience of currency union break-ups including Scandinavia, the Latin Currency Union, Yugoslavia and the USSR. But the Eurozone is unique in both size and level of financial integration. This makes historical precedents a poor benchmark for assessing the consequences.

In this piece we introduce a framework to understand how much the euro and its legacy currencies would weaken (if at all) in the event of a Eurozone break-up. We start by investigating current exchange rate misalignments within the currency union. Contrary to popular belief we find that these are quite small.

We then argue that the economic cost of break-up itself would be the biggest driver of currency moves. First, large-scale capital flight would be likely as the euro loses its reserve status and private capital inflows are unwound too. Second, capital controls, re-denomination of paper money and the unwind of complex cross-border exposures would cause a material negative productivity shock. Finally, inflation would likely accelerate in the periphery as central bank credibility is lost and policy is pushed towards eroding the real value of debt. We calculate that the cumulative impact of all these effects would amount to 25-30% weakness in EUR/USD. The near-term drop could be even bigger if capital flight is large. The euro's only silver lining is that the Fed has much greater space than the ECB to ease monetary policy offsetting part of euro weakness.

Current Euro-area misalignments are not that big

A useful starting point to estimate how much the EUR would weaken in the event of a break-up is to calculate valuation misalignments of existing member-state currencies.

We prefer a simple and transparent historical approach to gauge "fair value" post-breakup. Our historical benchmark is the relatively stable period before the formation of the Eurozone, roughly 1980-1998. During that period, exchange rates should have been at fair value on average. We use Purchasing Power Parity (PPP) and Fundamental Effective Exchange Rate (FEER) models to calculate fair value.² The PPP model assumes that real effective exchange rate should converge to its average pre-EMU level. The FEER model assumes that the real effective exchange rates should adjust to whatever level would bring national current accounts to the average pre-EMU levels, this being consistent with domestic saving-investment equilibria.

Our method avoids the assumption that national currencies were converted to the euro at fair value. To the extent that convergence to national conversion rates in the months leading up to conversion meant divergence from fair values, these distortions are minimized by cutting off the baseline in 1998 and using a relatively long look-back period. We also consider long-term averages more objective than the alternative assumption that exchange rate levels in a particular year--say, 1995--represented fair values.³

¹ Sarvelos, George & Brehon, Daniel "2,000 years of monetary union history", September 2011

² See our weekly FX Valuation Snapshots for more details on our valuation frameworks.

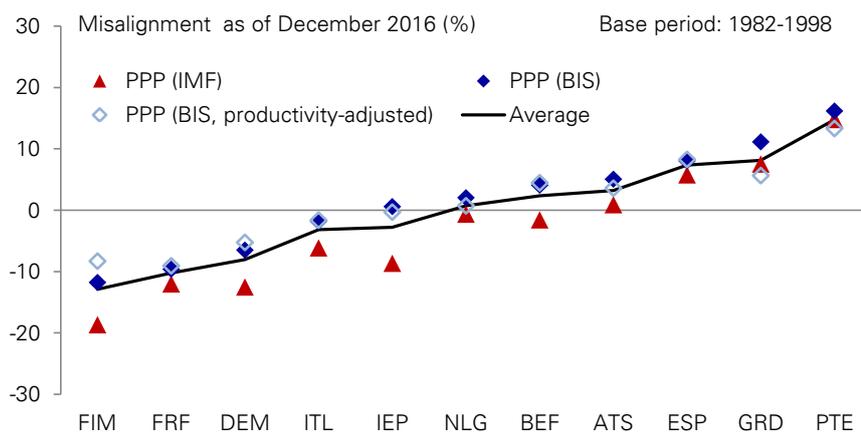
³ For example, Bayoumi et al (2011), "Euro Area Export Performance and Competitiveness", IMF Working Paper choose 1995 as reference period.



PPP misalignments between -15% and +15%

In terms of purchasing power parity, we observe the predictable pattern of the northern member states being undervalued and the periphery being overvalued. At one end of the scale, Finland, France, and Germany are about 10% undervalued (Figure 2). At the other end, Spain, Greece, and Portugal are 5-15% overvalued. In aggregate, the euro is currently cheap. We use a range of real effective exchange rates, and while the general degree of euro misalignment varies with time series, the intra-EMU misalignments are largely the same.

Figure 2: On PPP, northern currencies are cheap, periphery is expensive

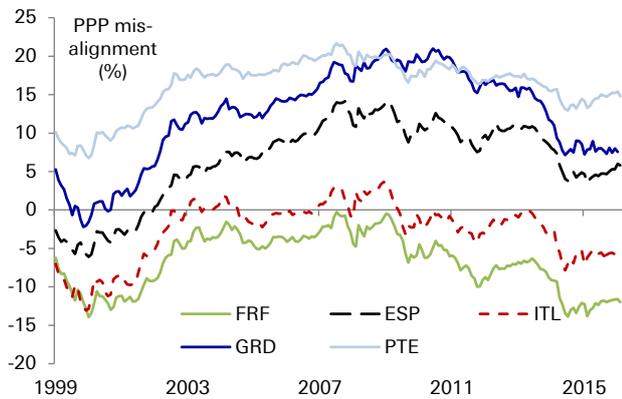


Source: Deutsche Bank, IMF, BIS, Haver Analytics

To many readers, the misalignments may appear surprisingly small. Plotting PPP misalignments over time, always measured against the 1982-98 benchmark, shows that some economies have come a long way in converging since the financial crisis, particularly Greece and Spain (Figure 3). Italy was never significantly overvalued against the pre-EMU benchmark, and in fact benefits from an undervalued currency given the euro's current levels. In contrast to its periphery peers, Portugal has corrected little of its extreme overvaluation, perhaps the result of having joined the euro at the most expensive rate of all member states. The most striking development has been in Ireland, which has overshot in correcting its 15% undervaluation at the outset of the financial crisis to a 10% undervaluation today, close to Germany's current misalignment (Figure 4).

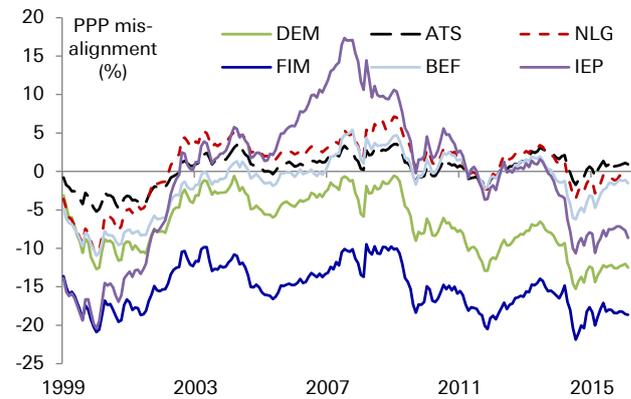


Figure 3: Greece and Spain have converged rapidly since the financial crisis



Source: Deutsche Bank, IMF, Haver Analytics

Figure 4: Ireland has overshoot in correcting its pre-crisis undervaluation

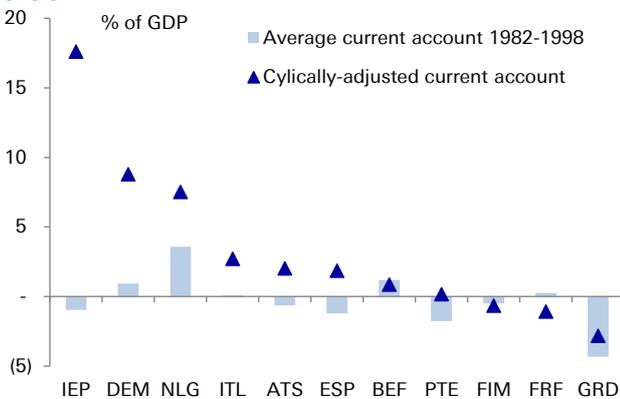


Source: Deutsche Bank, IMF, Haver Analytics

External balances point to more undervaluation

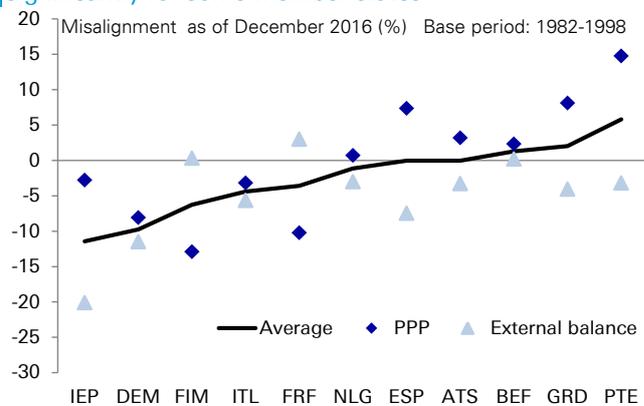
Moving on to the external balance FEER model, the results suggest that the aggregate euro is currently even more undervalued than on PPP, the result of current account balances generally sitting above their equilibrium levels (Figure 5). In the detail, the results are consistent with the PPP valuations for some member states, particularly Germany, Italy, Belgium, and the Netherlands (Figure 6). For other member states the results are less consistent. Most notably, the implicit Greek drachma and the Portuguese escudo are much closer to fair value than on PPP. If this seems surprising, consider that in cyclically adjusted terms the periphery is running current accounts that comfortably exceed pre-EMU averages (Figure 5). External balances have improved considerably since the financial crisis (Figure 7). Portugal in particular has closed an enormous current account deficit of almost 15% of GDP in under a decade, suggesting much faster convergence than on PPP. Among the core member states, Germany and the Netherlands appear to benefit most from the common currency, having raised their current account surplus significantly above pre-EMU levels (Figure 8).

Figure 5: External balances generally above equilibrium levels



Source: Deutsche Bank

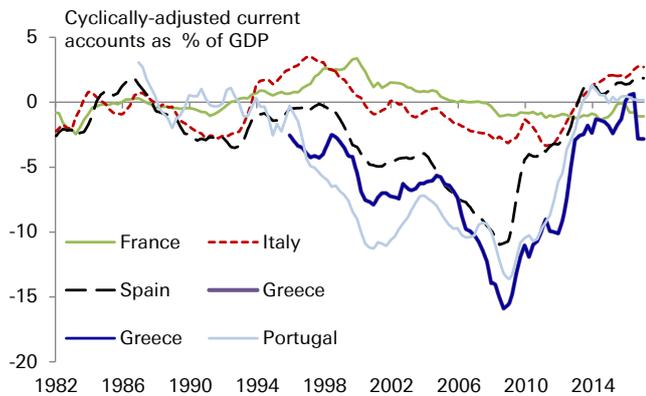
Figure 6: PPP and external balance fair values deviate significantly for some member states



Source: Deutsche Bank

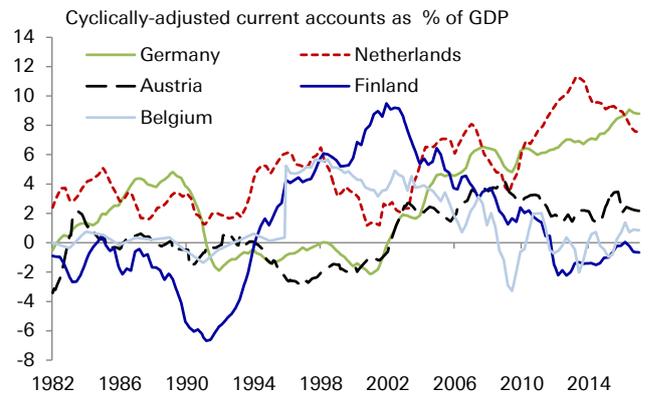


Figure 7: Periphery external accounts improved lately



Source: Deutsche Bank, Haver Analytics

Figure 8: Core balances are at least at pre-EMU levels

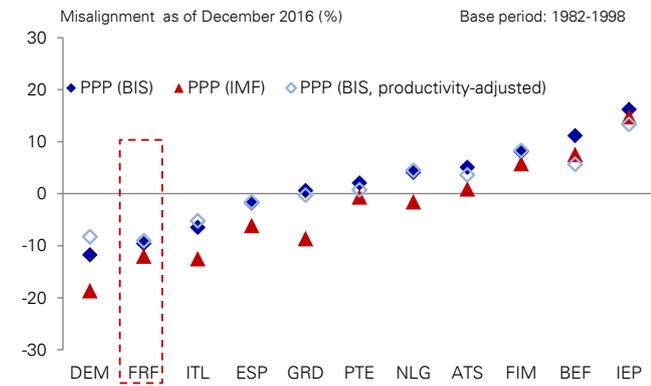


Source: Deutsche Bank, Haver Analytics

A closer look at France

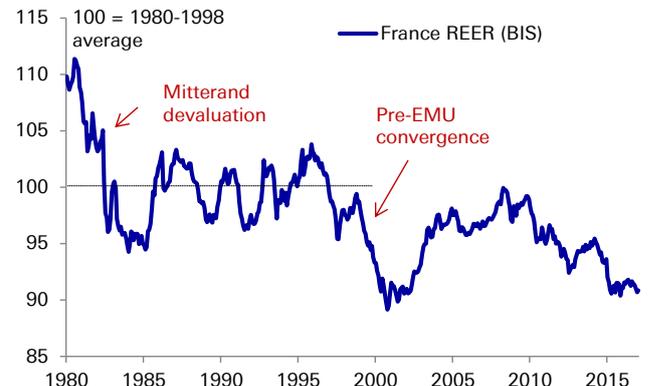
Some investors may think that France could redenominate without breaking up the Eurozone. So let's dig into the current misalignment of the French franc in a little more detail before moving on. Based on a range of PPP models, the implicit franc is about 9-11% undervalued in real effective terms (Figure 9). There is little variation between models using different price measures, and even adjusting for productivity growth relative to trading partners makes no material difference. As for the baseline, certainly the two decades between 1980 and 1998 brought at least two structural shifts, first the post-1979 devaluations and then the depreciation after the announcement of the euro in 1995 (Figure 10). But we get the same results when narrowing the benchmark period to 1982-1995. The PPP valuation is thus reasonably robust.

Figure 9: French franc about 10% undervalued on PPP



Source: Deutsche Bank

Figure 10: The franc was likely in equilibrium 1982-98



Source: Deutsche Bank

On the external balance model, by contrast, we estimate that France's REER is about 3-4% overvalued (Figure 5). This is because France joined the euro having historically run small current account surpluses, as opposed to average deficits of around 1% of GDP since the financial crisis (Figure 6). The deterioration in France's trade balance is most likely home-made insofar as quality-price ratios have declined materially since 1999.⁴ As the issue is price competitiveness rather than poor geographical positioning, an independent

⁴ Bas et al (2015), *In Search of Lost Market Shares*, Conseil d'analyse économique.

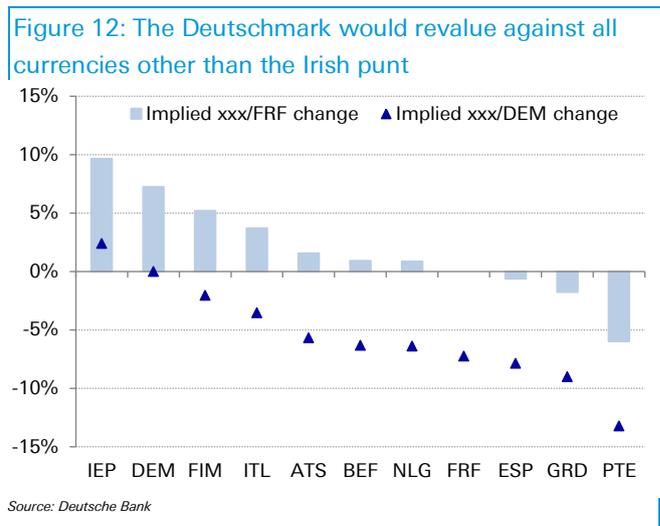
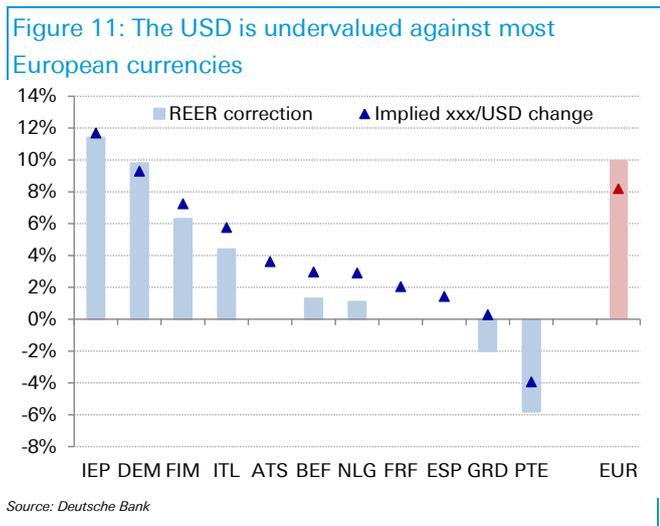


franc should be weaker than the euro. As a cross-check, the IMF’s external balance assessment, based on the staff’s current assessment of internal-external balance, also considers the French REER 3-9% overvalued, our estimate thus falls within the lower end of that range.⁵

Taking both the external balance and PPP models together, our best judgement is that the French franc is more or less at fair value, all things constant. This is an interesting result in implying that there would not necessarily be any meaningful impact on the fair value of the residual euro if France could indeed be managed out of the euro without breaking up the Eurozone and with no collateral damage.

What would happen to legacy currencies after break-up?

Assume that we could indeed unravel the Eurozone at no cost, and that legacy currencies would settle at “fair value” based on our PPP and FEER models after. How much would legacy currencies move? In aggregate – and under the brave assumption of no cost – a trade-weighted basket of legacy European currencies should appreciate. The euro is undervalued by about 10% in trade-weighted terms or 8% against the US dollar (Figure 11). Translating the dollar crosses into DEM-crosses using a simple matrix inversion method,⁶ the German deutschmark turns out to be overvalued against all currencies except the Irish punt (Figure 12). Portugal would devalue by up to 15% against Germany but only 5% against the dollar. A new Greek drachma would not have to devalue at all against the dollar and only 10% against Germany.



⁵ IMF Article IV staff report, 2016.

⁶ There are thousands of potential moves in bilateral exchange rates that generate the same move in trade-weighted terms for each legacy European currency. For the sake of simplicity, we assume that the broad dollar effective exchange rate remains constant.



Introducing a “cost” to breaking up the euro

Clearly, the assumption of a “zero-cost” Eurozone break-up is unrealistic. A break-up would have very large cyclical and structural implications. While it is impossible to predict these shocks with any degree of precision, we introduce a framework to think about their relative impact on the exchange rate. We estimate the impact on the euro in two steps, starting with how much euro weakness would be likely to materialize just before break-up. In a perfectly rational market, the value of EUR/USD just before break-up should be equal to the value of its constituents just after.⁷ Once again, our starting point is our PPP and FEER models.

Introducing a negative productivity shock

Our workhorse PPP model includes a productivity factor⁸: for any given shift lower in productivity, so does “fair value” in the exchange rate need to move lower. Some economists have argued that productivity in the periphery would have been higher outside the Eurozone. Artificially low real rates shifted resources to the relatively unproductive construction sectors and led to capital misallocation.⁹ The counter-argument, which we subscribe to, is that the implications of a Eurozone break-up for trade, financial integration and broader economic growth would be extremely detrimental to productivity growth. This is particularly the case if one believes that Eurozone break-up could risk the disintegration of the European Union.

There is a wide literature that shows significant productivity benefits from the sort of financial integration that came with the Eurozone.^{10 11} It is the direct economic cost of break-up that would likely be the most damaging however. Could it be temporary? The experience of the 2008 financial crisis suggests otherwise.¹²

The defining event of a Eurozone break-up would be a capping or outright suspension of cross-border Target 2 payments, the ECB’s system of real-time cross-border euro settlement. This could happen by the ECB capping or suspending commercial banks’ access to central bank liquidity. Capital controls and a loss of market-access would likely entail financial costs much greater than those experienced by Greece or Cyprus or indeed the 2008 financial crisis.¹³ To start with, and unlike Greece or Cyprus earlier this decade, all Eurozone members maintain strong reliance on cross-border financing for both sovereign bond markets and banks. Financing for both would likely freeze up around an exit event. An EM-style “sudden stop” would be likely until a legacy institutional arrangement was put in place.

⁷ What would be the relative weights of the constituent parts delivered to the holder of a euro? The answer is not straightforward and would be the outcome of a political agreement. Here we assume that it would be weighted by the ECB capital key.

⁸ We use three different productivity metrics: real GDP per capita, total factor productivity, and the ratio of tradeables to non-tradeables prices

⁹ Reis (2013), “The Portuguese Slump and Crash and the Euro Crisis”, *Brookings Paper on Economic Activity*; Benigno et al (2014), “The Financial Resource Curse”, *Scandinavian Journal of Economics*; Gopinath et al (2015), “Capital Allocation and Productivity in South Europe”, NBER Working Paper

¹⁰ Cf. Bonfiglioli (2008), “Financial integration, productivity and capital accumulation”, *Journal of International Economics*, 76(2), pp. 337-55.

¹¹ Cf. Kose et al (2009), “Does openness to international financial flows raise productivity growth?”, *Journal of International Money and Finance*, 28(4), pp. 554-80.

¹² Ball, Laurence (2014), “Long-Term Damage from the Great Recession in OECD Countries”, NBER Working Paper 20185, May

¹³ Cross-border bank and sovereign exposure was materially reduced in the run-up to capital controls in both Greece and Cyprus, both economies subsequently benefited from an IMF/ESM financing program that prevented disorderly defaults. In the event of a Euro-area wide break-up such a backstop is unlikely to exist.



A legacy institutional arrangement – even if arranged in a few weeks – would be unlikely to resolve the costs of exit. Beyond the immediate disruption of redenomination, it is the extremely large pool of unhedged cross-border FX exposure that would be the most economically disruptive. European investors, corporate and banks have transacted in euros under the assumption of zero exchange rate risk. The Eurozone project was partly conceived precisely to achieve this frictionless market with sharply reduced transaction costs. We estimate that intra-EUR cross border assets plus liabilities totaled 46 trillion Euro at the end of 2016. This is an upper bound estimate of EMU exposure that would have no hedge, and be exposed to currency risk in the event of an EMU break-up. Even FX balance sheet ‘mismatches’ that are a small fraction of this number would cascade through the financial system, with wide-spread defaults and unprecedented financial stability implications.¹⁴

Figure 13: Estimate of intra-EMU currency exposures

2016Q3 IIP (EURbn)		Euro Area (external)	All EUR countries	Estimated
			=external+intra	intra
Total	Net	-866	-280	586
	Asset	22851	46075	23224
	Liabilities	23717	46384	22667
L/T portfolio	Net	-2598	-2854	-256
	Asset	7690	15953	8263
	Liabilities	10288	18850	8562
Equity	Net	-2144	-2236	-92
	Asset	3103	6341	3238
	Liabilities	5247	8583	3336
Bonds	Net	-455	-217	238
	Asset	4586	10031	5445
	Liabilities	5041	10284	5243
FDI	Net	1694	2268	574
	Asset	9747	16275	6528
	Liabilities	8053	13983	5930
Other Inv.	Net	-639	-77	562
	Asset	4737	10307	5570
	Liabilities	5376	10396	5020
Reserve	Net	727	1590	863
Financial Derivatives	Net	-49	-10	39

Source: Deutsche Bank

Taking it all together our baseline would therefore be that capital controls, a “sudden stop” and large levels of unhedged FX exposure would generate a deep recession and lasting negative effects on productivity.

As a starting point, we simplistically assume that ten years after break-up European productivity is 15% lower than where it would be under a no break-up scenario. This is similar to the cumulative productivity drops experienced by the OECD countries hit by a large banking crisis over 2007-2011 (chart 13).¹⁵ This drop translates into a 15% depreciation in the REERs given average

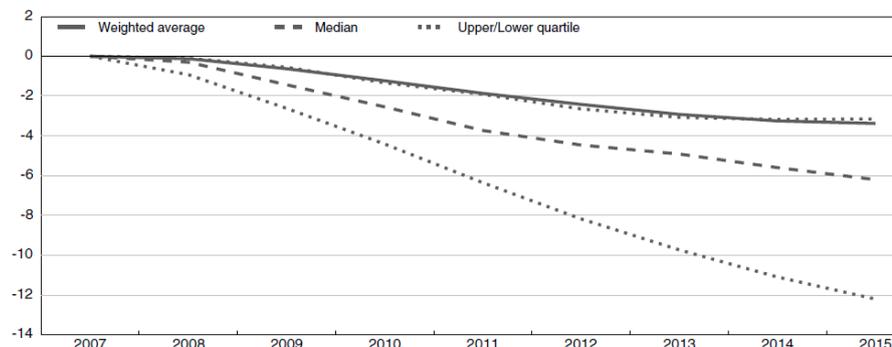
¹⁴ Alan Ruskin, How Brexit badly misleads on Brexit, 22 February 2017

¹⁵ OECD, “The effect of the global financial crisis on OECD potential output”, Volume 2014



elasticities. It is unlikely that the productivity impact is uniform. For peripheral member-states that have been benefiting from Eurozone (and EU) membership as an institutional anchor the cost could be bigger than the core.

Figure 14: Effect of banking crisis on potential output of OECD countries



Source: Deutsche Bank; OECD Journal: Economic Studies; Volume 14

Introducing higher inflation

A differentiating factor between the core and the periphery in the years after break-up would be inflation. The return to national monetary policy-making would likely come with *ex ante* loss of credibility for central banks in the periphery. Inflation-targeting could be seen as playing second fiddle to the temptation of reducing the value of the currency to boost exports as well as the real value of debt. As for the core, disintegration of trade in particular could lead to transient price shocks, but longer term national central banks in Germany, Austria, Luxembourg, Belgium, the Netherlands and Finland would likely be able to pursue 2% inflation targets with at least as much credibility as the ECB has done. As a baseline, we assume that the market would expect inflation in the periphery (including France) to widen by 2.2% *relative* to their trading partners on an annual basis over the next ten years, worth about 25% in the REERs in ten years' time. The overall impact on the EUR REER just before breakup would be around 15% if we use the ECB capital key as relevant weights (40% core versus 60% periphery).¹⁶ The effect would be smaller if we used member-state trade-weights outside of the EMU.

Putting it all together

Combining the estimates of the individual structural shocks from break-up with current PPP misalignments relative to pre-EMU levels, we can come up with estimates of fair value post-breakup. The PPP fair value of the overall trade-weighted EUR would decline by about 30% from 10% over-valued to 20% under-valued. Approximately half of the adjustment would be due to a negative productivity shock and the other half due to a positive inflation shock. Even if this fair value estimate relates to the decade following break-up, our assumption is that the market prices this adjustment upfront

What about individual currencies? Given that we are assuming a symmetric productivity shock, the fair value of all currencies would decline by 15%. The fair value of peripheral currencies would decline by an additional 25% due to the inflation shock. The inflation shocks we are assuming generate some dramatic shifts in the required depreciation. From being under-valued by around 10% the Deutschmark would shift to being moderately cheap. On the

¹⁶ The relevant weights one should use are not straightforward. See the discussion around how EUR would behave pre-breakup later in the piece to understand why.

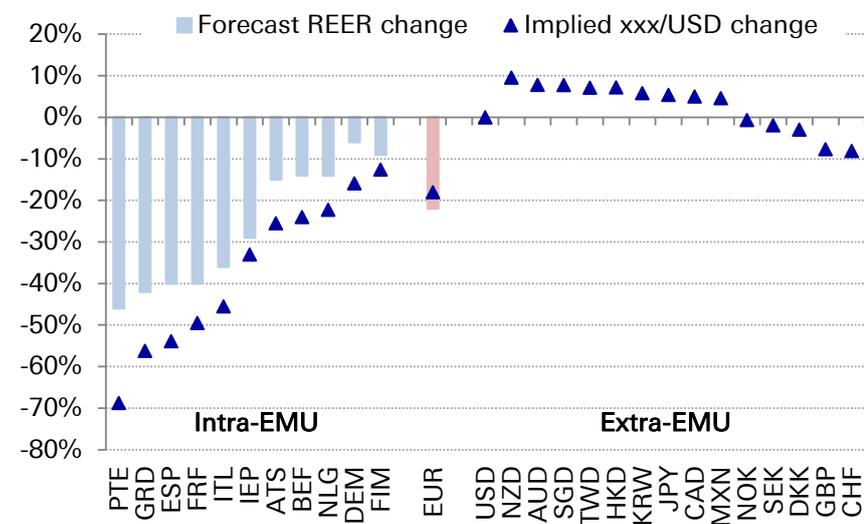


flipside, the periphery would appear dramatically over-valued from current levels: Spain, Greece, Italy and Portugal would all need to devalue by more than 40%. Clearly, our estimates are heavily sensitive to the size of the productivity and inflation shocks. The more inflation credibility can be maintained, the less the required depreciation. The less the hit to productivity, the smaller the depreciation too.

From REERs to bilateral crosses

How would these trade-weighted (REER) devaluations translate into bilateral crosses? There are thousands of potential combinations generating the same trade-weighted effect but under the assumption that the trade-weighted value of the non-EMU crosses stays constant¹⁷, the adjustment of the new Eurozone dollar crosses would exceed the required REER devaluations. The reason is that devaluation would be competitive. For example, if France needs to devalue by 10% in trade-weighted terms, it generally needs to weaken more than 10% against the dollar if her trading partners in Southern Europe are simultaneously devaluing by up to 20%. At one extreme, then, the Portuguese escudo could be almost 70% weaker against the USD (Figure 15). At the other end, the Deutschmark would need to depreciate by 15%, which is required for the REER to remain stable against significantly devaluing European peers.¹⁸ Lastly, we also included other European currencies to show that they would depreciate 2-3% against the dollar to preserve their competitiveness against a devaluing Eurozone. Asia, by contrast, would need to appreciate to preserve the competitiveness of the trade-weighted dollar.

Figure 15: EUR would flip from 10% cheap to 20% expensive after break-up



Source: Deutsche Bank

We would stress once again that our estimated currency moves are highly sensitive to our inflation and productivity assumptions. Inflation expectations in the periphery could rise more aggressively than we assume. The productivity impact of a break-up might be greater or smaller. Equally importantly, keep in mind that the broad euro is currently about 10% undervalued, which provides a 'valuation buffer' against the structural shocks described above.

¹⁷ We use Cline's matrix inversion method

¹⁸ Note that because Germany is so dominant in intra-EMU trade, the results will be particularly sensitive to what adjustment is assumed for the Deutschmark.

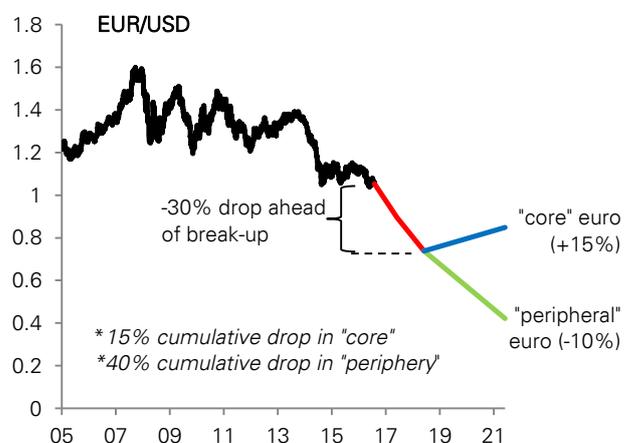


What about EUR/USD before break-up?

For investors, the more relevant question at this stage might be how these effects get priced into EUR/USD before break-up. We have already argued that a symmetric Euro-area productivity shock would push the fair value of all currencies (and the EUR) down by 15%. So the EUR should weaken by at least 15%. What about the inflation shock? The answer here is not straightforward because the shock is not symmetric. Peripheral currencies would need to devalue more than the core.

In a perfectly rational market, the value of the EUR just before break-up should be equal to the value of its constituent parts just after. Assume that for every 100 EUR an investor holds, legacy currencies are delivered according to the ECB capital key.¹⁹ Just after break-up, an investor gets 40% of core European currencies and 60% of peripheral currencies (including France). The value of this currency basket should be identical to the value of the EUR just before breakup when measured against the dollar. Peripheral currencies would have to settle at a level that is 25% lower to account for the inflation shock.²⁰ The core currencies would have to appreciate by an amount equal to the EUR depreciation observed before break-up to keep their fair values unchanged (after accounting for the productivity shock). On top of the weakness related to the productivity shock, a 15% depreciation in the EUR just before break-up is what ensures that the weighted value of a EUR legacy basket is equal to the value of the EUR just before breakup. After break-up, the peripheral currencies would depreciate by an additional 10%, while core would strengthen by 15% keeping the overall value of the EUR legacy basket unchanged.

Figure 16: The EURUSD drop before break-up assuming "no arbitrage" condition for legacy basket



Source: Deutsche Bank

¹⁹ There is huge uncertainty on the legal treatment of EUR-denominated contracts, particularly those under non-domestic EU law such as London or NY-based contracts.

²⁰ We are making two simplifying assumptions in this analysis. First, we are not incorporating the need to correct country-specific valuation misalignments. If we were to include these the drop in the euro would be even greater. Second, we are translating moves in the REER directly to moves in bilateral dollar crosses. In other words, we are not incorporating the effect of intra-EMU currency moves on each country's real effective exchange rate. If the "core" euro strengthens post-breakup, there is an implicit devaluation that happens in the periphery. This effect would reduce the required drop in the "periphery".



What about the current accounts?

Our approach so far has only focused on productivity and inflation shocks. What about shifts in current account equilibria? We again differentiate between France and the periphery on the one hand and the remaining core currencies on the other. The loss of inflation-fighting credibility, capital controls and large economic costs would all make current account deficits unsustainable in the periphery – our assumption is that external financing would dry up and be unlikely to return for a few years after break-up. For simplicity, we assume therefore that periphery economies with structural current account deficits, as defined by the pre-EMU benchmark, will need to fully balance their current accounts after breakup (i.e. bring them to 0%). Our fundamental effective exchange rate (FEER) model is best placed to capture the FX moves required to generate current account adjustments. This implies that Spain, Portugal and Greece are further below their external balances than we estimated above with reference to pre-EMU patterns. Spain and Portugal would need to devalue by 10%; Greece by 15%.²¹ The impact on the overall EUR REER would be around 5%.

Thinking about capital flight

The impact of Eurozone break-up on equilibrium exchange rates is just one approach to understanding how exchange rates would move. An alternative is to look at the impact on capital flows, which may be more relevant in the short to medium-term.

Reserve currency status is eroded

Global reserve managers would likely reallocate drastically in the event of a break-up. The euro contains a reserve currency premium that structurally makes it more valuable than the sum of its parts. The historical evidence for this is that, despite the rise of Asia and the RMB as a new reserve currency, the euro's reserve share of 20-25% has been above the combined 15-18% share of the core European currencies before 1999 (Figure 17). The main explanation is the liquidity that comes with size, as well as the credibility of the ECB and EU institutions.

However, if the Eurozone were to break up, it is doubtful that reserve managers would return to the pre-EMU allocations, for three reasons. First, the French franc may no longer qualify as a reserve currency given the likely political change. Second, the Deutschmark allocation in particular likely reflected a proto-Euro reserve currency premium well before 1999 as the nominal anchor of European currencies. With the common currency project over for good, this premium would no longer be justified. And third, global demand for European reserve currencies is likely lower than in the 1990s, with a far greater share of global trade today being conducted in USD and RMB.

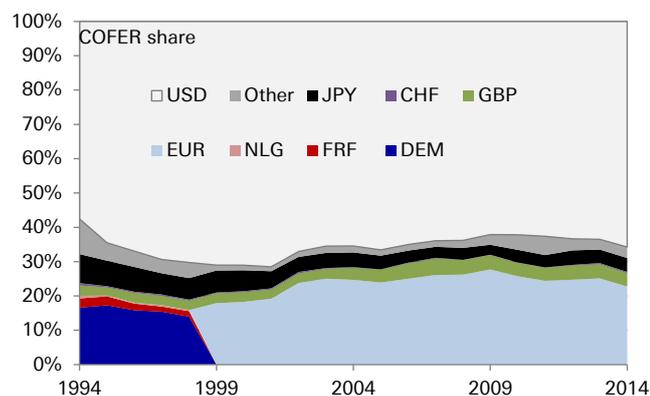
All things considered, we estimate that global reserve managers would retain only an 8-10% allocation to the DEM after break-up. This implies a reallocation of around \$0.5-0.9 trillion of reserve manager's current Eurozone assets of \$1.6trn. How much would this be worth in EUR de-rating? We use a simple relationship between the basic balance and EUR/USD that has proven quite robust since the start of the financial crisis. Assuming that \$0.5trn would be liquid enough to be reallocated to the US over the course of six months, this

²¹ Clearly, the impact/effects of this model are not additive to the PPP model but would be working in parallel. Our aim here is to exhibit the sensitivity of our results to changes in current account equilibrium assumptions.



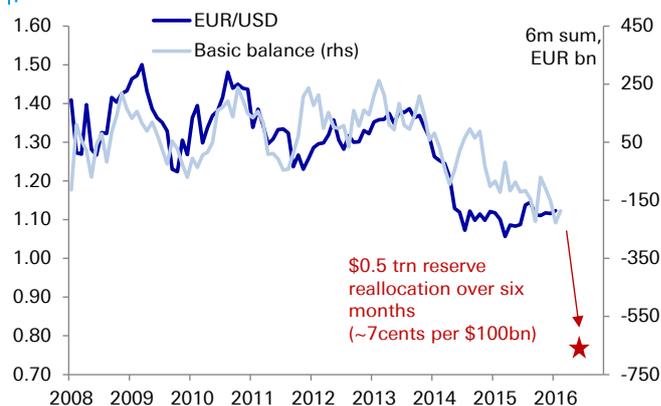
debt reallocation flow would be worth a roughly 30% depreciation in EUR/USD (Figure 18), holding other components constant. This assumption is fair because even if the point of devaluation is to improve the current accounts of the periphery in particular, trade will be slow to respond and the basic balance will likely be dominated by financial flows in the run-up to a referendum.

Figure 17: Deutschmark used to have ~15% COFER share



Source: Deutsche Bank

Figure 18: The basic balance to be dominated by large portfolio reallocation



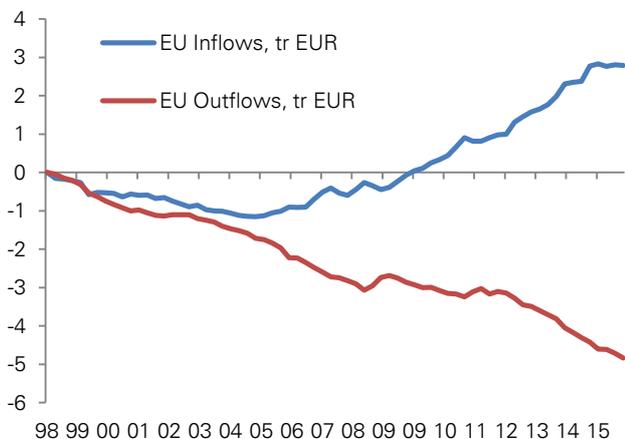
Source: Deutsche Bank

This could be more than a one-off flow effect. If the US dollar were to rule supreme again as the world's only reserve currency, the exorbitant privilege of the US earning positive investment income on a negative international investment position would increase even further and permanently reduce the current account deficit.

Our assumption of capital flight is extremely conservative because *net* private sector flows are assumed to remain unchanged. This assumption is optimistic for numerous reasons. First, in the event of break-up it is unlikely that core European markets can offer sufficient size and liquidity to accommodate safe-haven capital flight from the periphery. Second, the uncertainty around post-break-up arrangements and the cost that this may entail for Germany would reduce the attractiveness of German assets as a safe-haven. This is also likely to reduce the power of re-patriation flows which provided an important offset to capital flight in 2010-11. Finally, there have been 2.5 trillion of capital inflows into Europe since 1999 a portion of which is likely to be attributed to a "euro" premium related to the ECB policy credibility and a (partial) implicit German guarantee on all Eurozone assets. Even though outflows have outpaced inflows in recent year the Eurozone still holds a negative net international investment position: there are more foreigners invested in Europe than Europeans abroad. A 500bn EUR reserve re-allocation would be the lower bound of potential capital flight in the run-up to breakup.

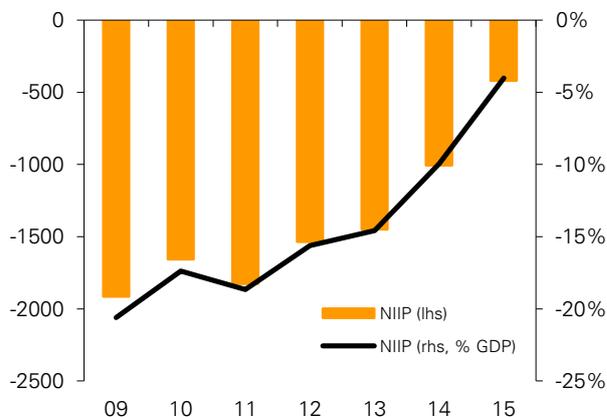


Figure 19: Cumulative portfolio flows in the Eurozone



Source: Deutsche Bank

Figure 20: Europe still has a negative net international investment position



Source: Deutsche Bank

ECB and the Fed response

Lastly, there is the issue of what the required ECB reaction is to keep the Eurozone together. Our baseline is that the ECB would do whatever it takes to avoid capital controls, which would likely spell the end of the Eurozone. Apart from expanding TLRTOs and tapping Fed swap lines, the ECB would likely ramp up APP and potentially cut the deposit rate. As long as the ECB maintained credibility—presuming tacit German consent to escalating Target 2 balances—emergency measures combined with the cyclical shock would lower Eurozone real rates and weaken the euro.

The Fed response could dominate rate spreads

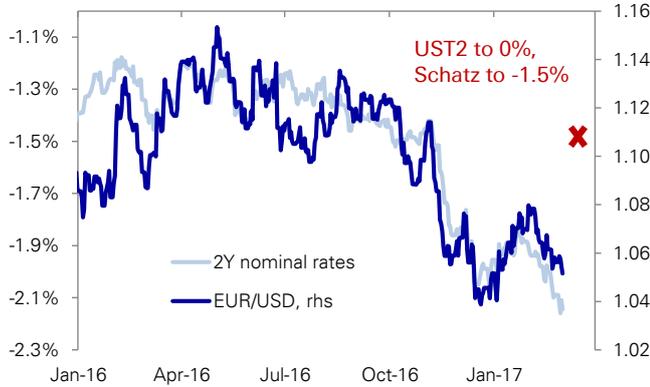
In the immediate aftermath of the French election, if the market started to panic about a referendum, the ECB response could come swiftly. But the market could start repricing Fed expectations just as quickly. In the extreme scenario of Eurozone breakup, US rates could become net supportive of EUR/USD insofar as the Fed would have to bear the lion's share in avoiding global contagion, simply because it has more room to ease monetary policy than the ECB.

Where might nominal rates go? To give a sense of the possible lower bounds, let's assume that both the Fed and the ECB manage to push long-term nominal yields back to their historical pre-crisis lows. For the Eurozone, this would imply ten-year bund yields going to -10bps, the QE peak of last September. The Fed could push ten-year Treasury yields back to 1.5%, close to the lows of both last year and 2012. In that scenario, the beta of roughly 10cents per 100bps implies EUR/USD rising 5-7%. This lift in EUR/USD would also be consistent with the German schatz yield going to -1.5% and two-year Treasury yields falling to zero. An even bigger Fed reaction pushing 10yr UST yields down to 1% would provide a positive offset to EUR/USD that is closer to 10%.

There are wide confidence intervals around these parameters, but the gist of our argument is that even if the ECB did whatever it took to keep the Eurozone intact, the bearish impact on EUR/USD would be more than offset by the Fed switching into crisis mode. We believe it is crucial to keep this reaction function in mind.

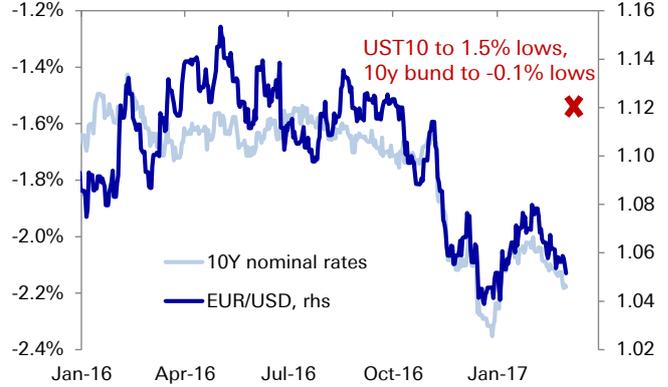


Figure 21: Monetary easing could be more aggressive in the US than in the Eurozone and support EUR/USD



Source: Deutsche Bank

Figure 22: 10-year yields going to historical lows would boost EUR/USD by ~5%

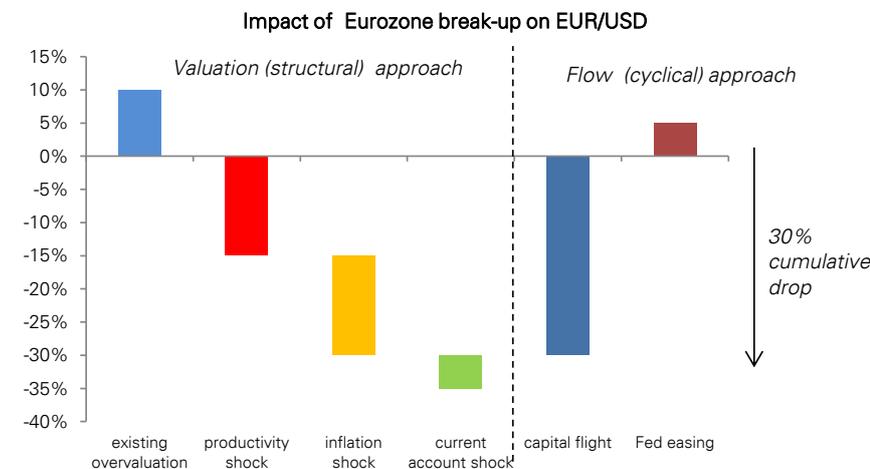


Source: Deutsche Bank

Bringing it all together and comparing to historical experience

We have introduced two separate approaches to calculating the potential impact of a breakup of the Eurozone on the euro. Our PPP approach suggests EUR/USD fair value would decline by 25% from current levels if we were to incorporate a productivity (15%) and inflation shock (15%). An additional current account shock would be worth 5% of EUR weakness on the FEER model. Our alternative flow approach suggests that EUR/USD would decline by 30% assuming 500bn EUR of reserve reallocation in the run-up to breakup. This is likely to be a lower bound assuming private capital flight. The Fed would be able to offset 5%-10% of the decline depending on the aggressiveness of its approach. Our PPP/FEER approach should be considered as the most relevant for establishing medium-term structural fair value in a “trade-weighted” legacy Eurozone basket after a break-up. Our flow approach is likely to be more relevant in the near to medium-term as the crisis plays out in real-time.

Figure 23: Bringing all the effects of break-up together



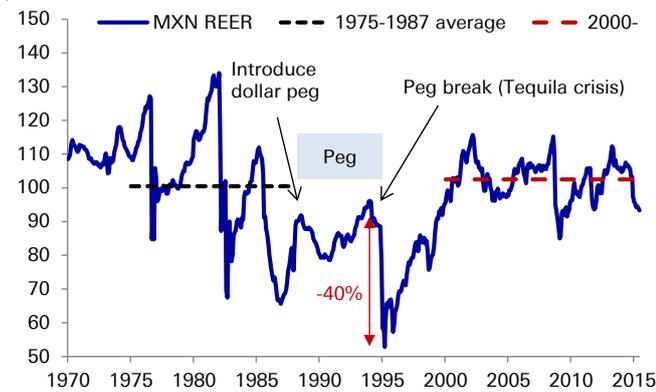
Source: Deutsche Bank



How do these estimates compare to historical experience? The estimate of a 25-30% decline due to capital flight is well within the range implied by historical devaluations. Brexit resulted in a 20% depreciation of the pound sterling. Two of the other currency crises in recent history were the devaluations in Mexico and Argentina. Following Mexico's 'Tequila Crisis', the peso dropped sharply by 40% while Argentina dropped by 50% (Figure 24 and 25).

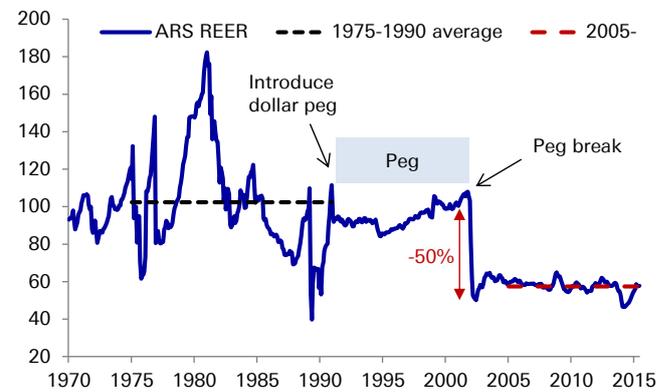
Where currencies ultimately settle will depend on how well the post-crisis adjustment is managed. When Argentina dropped its dollar peg in 2002 the peso plummeted to 50% below the pre-peg levels and never recovered (Figure 25). Mexico regained its pre-peg levels within five years. The crux of the argument is that where currencies may settle after the dust settles can be very different to the run-up and will ultimately depend on the inflation, productivity and current account sensitivities we have discussed in earlier parts of this report.

Figure 24: Mexican peso regain old equilibrium after the 'Tequila crisis'



Source: Deutsche Bank

Figure 25: Argentine peso dropped to a new equilibrium following the end of the dollar peg



Source: Deutsche Bank

France: what's the end-game?

Unless Le Pen won the parliamentary election in a landslide, we doubt that the market would have reason to assume the worst-case scenario of the National Front gaining the requisite majority to change electoral law, which would enable the government to follow through on the promised institutional reforms over and above leaving the Eurozone. In the baseline scenario under our frameworks, the French franc would devalue by 'only' 10%, less than even the National Front appears to believe. The main reason is that the EUR would likely weaken a lot more in the run-up to the event.

If the worst-case scenario materialized, probably following a successful Frexit economy, the French economy could revisit the turbulent period of the late 1970s and early 1980s, which saw structural sclerosis in the labour market, excessive public demand, nationalizations, inflation rates above 10%, and ultimately a series of devaluations of a cumulative 30% between 1978 and 1983.

In our view, the franc's equilibrium would fall significantly following a redenomination even as the market priced the less extreme institutional implications of Le Pen's program. Both our models are well suited to capturing specific structural breaks.



From a PPP perspective, what matters is that French inflation would likely rise materially after redenomination. One reason is that if Le Pen succeeded in reshaping France's economic institutions, the market would worry about inflation overshooting any modern targets. Even if central bank independence is unlikely to be undermined for the time being, the inflation risk premium would rise. Another reason is that the protectionist measures envisaged by *Front National*, particularly the envisaged import tariff, would be inflationary in the short-term.

Moreover, given the structural reforms envisaged by Le Pen—including nationalization and reductions in both working hours and the retirement age—we would expect France's productivity to decline relative to her trading partners, irrespective of the collateral effects of Eurozone break-up. At present, total factor productivity in France is about 5% lower than in the US, but 10% higher than among her (weighted) trading partners. The risk is that France's trading partners would catch up with French productivity levels after the massive structural shock that would result from redenomination, greater protectionism, and supply-side reforms. As the French REER has an almost perfect elasticity to our measure of relative productivity, the franc's structural equilibrium would thus be another 10% lower in five years' time.

From an external balance perspective, markets would likely force discipline on an independent France to run substantial current account surpluses. Recall that the current account is identical to net saving. The public sector of this would likely need to rise if Le Pen were to administer a drop in the retirement age, which would raise dependency ratios, a powerful and positive determinant of economies' saving rates. Correspondingly, the current account would need to improve, implying a weaker real franc than at present. Assuming that France's cyclically adjusted surplus needed to rise from its pre-EMU average of 1% of GDP to 3%, the fair value of the REER could fall by 5-10% from an external balance perspective. This is implied by the current account elasticity to the REER of roughly 40%.

Historically, the devaluations of the late 1970s and early 1980s would present the upper bound. In cumulative terms, the trade-weighted franc devalued by about 30% between 1975 and 1984, the period of excessive inflation, soaring public demand, and severe supply-side disruptions. Unlike today, however, devaluation came from overvalued levels.

All things considered, fair value for the French franc would probably fall by about 10% in real effective terms after redenomination. If Le Pen won a parliamentary mandate to change electoral law, the impact on fair value could be even worse and reach 20%. There are thus wide confidence intervals around this estimate. While readers may be more or less pessimistic on the structural shock to the French economy, there is little doubt that in relative terms France will be less competitive than prior to the EMU and that its REER will therefore need to be materially lower. In our view, it is consistent to believe that the euro has not, as of today, distorted French competitiveness and that nonetheless a rupture with the Eurozone now would significantly distort French competitiveness.



Conclusion

A break-up of the Eurozone would be a financially unprecedented event. In this piece we have identified the main drivers that would likely move the euro and legacy exchange rates in the run-up to, and after the event. We find that current currency misalignments under the euro are probably smaller than many market participants believe. The periphery in particular has recently converged to much better levels of valuation. If the Eurozone could be unwound smoothly, without collateral damage, the currency impact would be limited.

But there will be huge cyclical and structural shocks as a result of Eurozone break-up. Material tightening of borders to capital, goods, services and people will result in a significant productivity shock. In the periphery, central banks would likely lack the credibility to anchor inflation expectations. The periphery would also struggle to finance current account deficits outside the Eurozone, as the market would put pressure on governments to run meaningful surpluses and force painful current account reversals. In all, and using reasonable assumption, these shocks could mean that EUR/USD as a whole would flip from being about 10% undervalued at present to being 20% overvalued after break-up.

Looking beyond this valuation framework, we estimate that reallocation from reserve managers alone could be worth a 30% overshoot upon break-up. If we assume private capital flight, the decline could be even bigger. The only offset would be the fact that the Fed would likely ease monetary policy more than the ECB to contain the global contagion. This could be worth a 5-10% lift to EUR/USD depending on the Fed approach. Where EUR/USD ultimately settles would depend on the scale of the productivity and inflation shocks outlined above.

If the market were to price this scenario after the French presidential elections, EUR/USD could fall by about 25%. Our results suggest that no Eurozone currency would benefit from being on its own—and we would specifically caution against the notion that the Deutschmark would appreciate outside the Eurozone.

George Saravelos

Robin Winkler



Appendix 1

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