A brief history of break-ups

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How monetary unions die

Perhaps the Euro should not exist, but the cost of breaking it up is so enormous as to be almost unimaginable. However, history does contain examples when the unimaginable has not only been imagined but has been implanted. Continuing our series of documents on the Euro, we look at historical examples of monetary union failures and try to draw lessons for the Euro from past breakups.

When is a monetary union not a monetary union?

The importance of defining terms can not be over emphasised. Some entities called monetary unions are not in fact monetary unions. Looking for reassurances about the potential ease of breaking up the Euro in the collapse of the Latin Monetary Union of the 19th century is not comforting – the Latin Monetary Union was not a monetary union as we understand the term today. A monetary union is a single fiat currency, with a single monetary authority (central bank) a single interest and exchange rate, and a single legal entity for that currency across a geographic area. The Euro qualifies for this definition. We have chosen four monetary unions that also satisfy these criteria, and which have broken up in the last century (one of which subsequently reformed – the US monetary union).

Lessons from history

Monetary union break ups in the past have tended to exhibit four key traits. First, any monetary union fragmentation is characterised by a capital flight from perceived weak to perceived strong parts of the union. Second, monetary union breakups have tended to be regarded by governments as an opportunity for seizing cash or assets held by citizens. Third, capital controls tend to be imposed early in the breakup, and foreigners asset holding are often discriminated against. Finally the breakup of a monetary union is normally associated with civil unrest and authoritarian government in at least some part of the former monetary union.

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A brief history of break-ups

With the existence of the Euro being debated, if not outright challenged, inevitably there is an interest in looking back into history to see what happens when monetary unions break up. Unfortunately for the modern economist, there are precious few examples of monetary unions fragmenting. This is, perhaps, not terribly surprising. The consequences of a break up are generally so awful in economic, social, political and humanitarian terms that a break up is rarely if ever the best of the options available.

We set out below what modern evidence we have that may serve as a guide when considering the break up of the Euro. The list is illustrative, not necessarily exhaustive (though the main fragmentations are covered). We also include some non-monetary union break ups, in particular the Latin and the Nordic "monetary unions". These are included not because of what they can tell us, but because of what they can not tell us about a break up of the Euro.

None of this is to suggest that we think a Euro break-up is likely. As we outlined in our Global Economic Perspectives "Euro break-up – the consequences" (6 September 2011) we believe a break up to be a very low probability (and a complete disaster should it occur).

Defining terms

Before considering the historical experience, it is important to get the terms right. What, in fact, is a monetary union? It is not a currency board, or a fixed exchange rate, or a currency union (where different currencies circulate alongside one another). For the purposes of analysing the Euro, it has to be something that resembles the Euro in some way. That implies a single currency across a geographic area, with a single monetary authority, a single exchange rate, and no capital controls restricting the movement of the currency within the geographic confines of the monetary union. So far, so good. But we need to go further than that.

The currency also needs to be a fiat currency – that is to say, it needs to be a paper currency. Allowing gold coins to circulate in one geographic area does not make a monetary union; it just means citizens of that area have an appreciation of the intrinsic value of the gold in gold coin.

Finally, a monetary union must have a single currency in law. A contract written within one part of the monetary union must refer to the same currency as a contract written in another part of the monetary union. This is important in looking for parallels to the Euro. It is far easier to break up a currency area where there are different currencies in different parts of the common currency area – because contracts are not voided in the wake of the break up of the union.

Bearing these definitions in mind, we can now examine past episodes of common currency fragmentation. There is an essential distinction between those monetary unions that depended on specie (generally gold and silver) for their currency, and those that depended on fiat currency (paper). The former have

little to tell us about the current crisis. The latter offer some interesting observations.

The New England Colonies 1744

Before independence, the American colonies of New England had a limited monetary union. Specie payments (gold and silver) dominated, but colonies financed themselves with paper issue as well. Bills of credit were issued, and traded between the colonies at par (that is to say, a bill of credit from one colony would be accepted at face value as a payment in another colony).

This was clearly not a monetary union as we know it today. There was no central bank, no single issuing note authority, and the system was subject to abuse. Abuse was exactly what happened – Rhode Island started printing money aggressively (between 1710 and 1744 bills of credit from Rhode Island grew on average 14.4% per year, and most of them wound up in the other colonies). As a result the various states, starting with Massachusetts in 1749, passed laws prohibiting the circulation of other states bills of credit within their own borders.

There is little to be learned from this episode for modern analysis. This was a currency union of convenience – a temporarily fixed exchange rate system that broke down under the pressure of one economy printing too much of its own "currency". It was never a monetary union in a proper sense.

The United States 1861

The onset of the US civil war saw the Confederacy issuing its own fiat currency (known as the Grayback, owing to the rather primitive printing process which produced a limited colour scheme). This was not an overwhelming success – despite the precaution of bearing a signature on every note, it was readily forged. The Union issued its own fiat currency, the Greenback. California, meanwhile, while part of the Union also allowed contracts to specify that payment would have to be in specie. This "Goldback" currency was (in the view of the Union Treasury secretary) in defiance of the laws governing legal tender in the Union – because a creditor could refuse payment of a thousand dollars of Greenbacks (face value) and insist on payment of a thousand dollars of gold.

The breakup of the US monetary union is an interesting development, because essentially a specie based system was replaced by distinct fiat currency regimes (except in the West). The legal tender status was enforced by law (until such time as the Confederacy ceased to exist, when of course the Grayback lost any status). However, there is little to be learned for the Euro today. This was the introduction of a new fiat currency (or two fiat currencies) that was, theoretically, an extension of the existing specie based dollar. No fiat monetary union broke up as such, because no fiat currency union existed prior to the war (and indeed the creation of fiat currencies was highly controversial. The Union Treasury Secretary, Salmon P. Chase, who introduced the Greenback was also the man who as Chief Justice of the Supreme Court subsequently ruled the Greenback to be unconstitutional).

The Latin Monetary Union

The Latin Monetary Union is often cited as an example of a break up that worked. This was a union in Europe, across several countries, created in 1865.

However, despite the name, it was never really a monetary union – simply a standardisation of specie (it could also be thought of as a fixed exchange rate regime against gold and silver).

The treaty of 1865, between Belgium, France, Italy and Switzerland starts off well. The preamble states the intention of "…forming between them a monetary union…". Right there, in black and white, is the intention to have a monetary union. Unfortunately, the sentence continues "…to the progress of uniformity of weights, measures, and money…".

The union was all about the now rather obscure debate about whether to have a gold standard (as the British did) or a bimetallic or double standard of silver and gold, as a basis for coinage. The French were particularly strong advocates of a double standard, and this view was imposed by the French authorities on the rest of the union. The union aimed to allow the coins of the various member states to circulate unimpeded between the different countries, and to be accepted as legal tender in each of the different countries. However, bank notes (fiat currency) were not treated as common currency, and could not circulate in the different parts of the union. Basically, this was all about having coins of the same size and quality issued by each member state.

What this meant was that the Latin Monetary Union was no monetary union at all. Contracts were written referencing local currencies (the lira, the French franc or the drachma). The coins of these currencies were interchangeable, but then there was no reason why they should not be interchangeable. The coins were specified minutely in the treaties of the union, and so they were (in terms of the gold content, etc) to all intents identical bar the designs upon them. The 100 franc coin, for instance, had a weight of 32.35806 grams and was 0.900 fineness of gold, with a diameter of 35mm. The 2 franc coin was 10 grams of silver of 0.835 fineness and a 27mm diameter. With such precision as to the content of the coins, there was no need to distinguish them from one another.

Bank notes were a different matter, however. Italy issued a lot of bank notes, right from the start of the monetary union. These were not accepted as currency elsewhere in the union, though were legal tender in the issuing country.

The Latin Monetary Union went through a series of convulsions, and effectively transitioned into a gold standard from 1878 (i.e. a fixed exchange rate mechanism).It is telling that, in 1885, the "inferior" silver coinage was to be redeemed (into gold) by the issuing state. There was no sense that the coinage was collective. Prior to its morphing into a fixed exchange rate mechanism, it had really just been a standardisation of weights and measures. In that form it was no more a monetary union structure than is the use of the kilogram or the kilometre. The Latin Monetary Union was no monetary union in the modern sense of the word, and it offers little guidance to the Euro.

The Scandinavian Monetary Union 1905

Sweden and Denmark established a currency union (known to contemporaries as a monetary union) in 1873, which Norway joined in 1875. Initially this monetary union resembled the Latin Monetary Union, in that it was simply a standardisation of weights and measures. A decimal system based on standardised gold coins (the kroner) was established. Bank notes did not

circulate across borders (at least, not as legal tender), and in that sense this was not a monetary union as we would now know it. In fact the three countries had previously seen their distinct national coinage (which was silver based) circulate without much discrimination amongst the three countries. The standardisation was just accepting and normalising what custom had rendered normal.

Subsidiary coins (smaller denominations, which did not contain specie) could be converted into gold at par value. Thus it was technically possible for one of the Scandinavian central banks to manufacture subsidiary coins and distribute these to their neighbours in exchange for gold coin. Self interest and the fact that all subsidiary coin was supposedly redeemable against gold limited this.

The more important change came in 1894 when the Norwegian and Swedish central banks agreed to accept each other's bank notes at par. Denmark joined this fiat currency union in 1901. At this point there was something closer to the monetary union we know with the Euro. It was a fiat currency union, albeit based on specie. Notes were accepted as long as they could be converted into gold (at least in theory) However, the three currencies still existed in distinct form – the bank notes of Sweden were not the bank notes of Norway or Denmark, and it was the individual countries that controlled their supply. The legal money of each country was, in this sense, distinct as well (rather than today when a Euro in a Greek contract refers to the same currency as a Euro in a German contract). Moreover, there was no common interest rate (as there was no common currency – rather three separate currencies that were accepted as having the same value). Indeed for most of the union the Danish discount rate was notably lower than that of either Norway of Sweden.

The fiat currency union broke up in 1905, with the exchange between central banks no longer taking place. The break up was facilitated by the fact that the union was more of a fixed exchange rate regime that saw notes and coins circulating between the three members. Thus, for instance, a legal contract written in Sweden referred to the Swedish kroner. Pre or port the fiat currency union fragmentation, a Swedish kroner was a Swedish kroner. Even if the value changed, there was no default so long as a Swedish kroner in some form was paid.

Again, the fact that this was a specie based union with a currency union (rather than a monetary union) temporarily operating alongside means that there is little in the way of direct precedent for the Euro to look to. It is to the truly fiat currency unions we should now turn, to getter a better idea of the implications of monetary union breakup in the modern world.

The Austro-Hungarian Monetary Union 1919

The end of the First World War brought with it a swift fragmentation of the Austro-Hungarian Empire, and independence for occupied territories. There had been a fiat currency monetary union between Austria and Hungary from 1878 (when the Austro-Hungarian bank was established). The currency issued, the crown, was legal tender in both states. It was also used elsewhere in the Empire, though other currencies also existed. The Kingdom of the Serbs, Croats and Slovenes that came out of the war had crowns, dinars, perpers and leva circulating in its territories.

The Empire had financed the war through the monetisation of debt, coupled with stringent capital controls to defend the international value of the crown. After the war, the Austro-Hungarian Bank had representatives of Czechoslovakia, Italy, The Kingdom of the Serbs, Croats and Slovenes, Poland and Romania along with Austrian and Hungarian representation. These countries all accepted crowns in all or part of their territories.

The monetary union quickly unravelled, however. National feeling, dual currency regimes, and a tendency to inflate the crown led to a centrifugal force that proved irresistible. From 1919 each territory created its own currency.

The process of separation with the disintegration of the Austro-Hungarian Empire is perhaps the closest model we could have for a prospective disintegration of the Euro. States acted independently, and the old Austro-Hungarian crown effectively ceased to exist at the end of the process. The main method was stamping existing notes.

Thus in the Kingdom of the Serbs, Croats and Slovenes, all Austro-Hungarian notes within its territory were called in and stamped with the national emblem. This then became legal tender (while unstamped notes were not). Unfortunately for the Kingdom, the stamp was easily forged – and so the process had to be repeated in November 1919. With this second process the government kept 20% of the notes and invested them in government bonds (on behalf of the owner of the notes, of course). The remaining stamped notes were then exchanged for (existing) Slovakian dinars at a fixed exchange rate in 1920. The rate was worse than the market exchange rate for crown-dinar conversion in Vienna.

The Czechoslovakian state also stamped notes in 1919, and owners also had to surrender some of their cash to be “invested” in a government bond. This forced loan paid 1% interest (which, when considered against prevailing US Treasury bond yields today, is perhaps not as bad as it might first seem). Stamped notes were then converted into Czech crowns, and a rate of one for one was set for the purposes of settling outstanding debts.

Austria also stamped notes in 1919, and froze 50% of bank deposits as part of the operation. Obligations in crowns were converted into obligations in stamped crowns at par. However, many citizens held onto their unstamped notes, in the hope of being able to convert them into Hungarian or other currency. Exports from Austria (there were not that many) had to be denominated in foreign currency. A dual currency system also evolved (not dissimilar to the rand in South Africa under apartheid) with foreigners having crowns (in ausland accounts) that were free of restrictions, and Austria citizens having inland accounts that could only be used for domestic purposes.

Hungary was the final country to abandon the Austro-Hungarian crown, stamping notes in 1920. Because it was the last to stamp, and because the Hungarian currency was stronger than the stamped Austrian currency, there was an arbitrage across borders.

In theory this model of disintegration could apply across the Euro area. With capital controls (and some ban on the movement of people across borders), physical Euro could be stamped and converted into national currency. Bank accounts could be first frozen then converted at an arbitrary exchange rate (with

or without a forced loan). Of course, enforced conversion of liabilities into the new currency would be considered a default by foreign lenders, and the government debt would also be considered to be in default – though a forced loan (de facto a wealth tax) might reduce the risks to fiscal policy. Any anticipation of stamping notes would lead to a run on banks in (perceived) weaker currencies – or people hoarding unstamped Euro notes in the hope of being able to convert them in another geographic territory – this was a feature of the Austro-Hungarian experience.

The precedent of the Austro-Hungarian monetary union break-up is not an entirely optimistic one. Austria and Hungary descended into hyperinflation and authoritarian governments – and Austria was forced to summon the League of Nations to manage its currency, which eventually converted to a new denomination (the schilling, which lasted until 1999).

United States 1932 / 33

The break up of the US monetary union in 1932 / 1933 is in many ways an odd episode in the history of monetary unions. It was a break up without new currencies being issued (at least, not in a formal sense). It was also a break up that did not last – the union was reformed in 1933 under the new administration of President Roosevelt.

Although the dollar continued to be the single currency of the United States, and circulated as a fiat currency (albeit one backed by gold), in effect individual states legislated against the monetary union. The banking crises of 1931 saw over half the failures (weighted by deposits) take place in the Federal Reserve districts of Chicago and Cleveland. By the end of 1932, across the union companies were starting to transfer deposits out of local banks and into New York based banks. States began to declare bank holidays – effectively attempting to prevent the transfers – but this only accelerated the process of transfer in those states that kept their banks open. The Michigan bank holiday served as an accelerant. The New York Fed lowered bill purchase rates, but because it was return of capital rather that return on capital that mattered there was no noticeable effect on the pressure of inflows.

In January 1933 the Federal Reserve in Chicago refused to discount the bills of (i.e. lend money to) the Federal Reserve in New York. At this point the monetary union had effectively ceased to operate with any degree of coherence – and banking system regulations were de facto imposing capital controls at state boundaries. By the Roosevelt inauguration in March 1933 thirty five states had bank holidays, and most of the rest had limited withdrawals from their banking systems. The dollar still existed, and was still legal tender, but it was practically impossible to move it across a state boundary except in physical form (and it was increasingly difficult to obtain in physical form). Barter began to replace currency as a medium of exchange.

The situation was remedied with a federal bank holiday in March 1933 – which effectively shut down the entire monetary union for a period of two weeks. Banks then reopened gradually, and interstate transfers where once again possible.

The US example is of interest to the Euro area not because it succeeded, but because the monetary union held together. A combination of labour mobility, banking reform and recapitalisation, and a more complete fiscal union allowed the monetary union to be reconstituted on a more workable footing.

In terms of lessons for a breakup, the process of effectively shutting banking systems at a state level (or limiting deposit withdrawals in some cases) allowed a de facto breakup of the union to occur by imposing what were to all intents capital controls on state borders. Any attempt to secede from the Euro would, inevitably, involve some similar operation. The lessons of 1932/3 may also be instructive as a guide to handling a Greek default. With the fear of contagion focusing on the banking system within the Euro area, declaring a bank holiday or limiting withdrawals from banks across the Euro zone while politicians finalise a more effective solution may be a successful interim measure. It is not a solution, of course (no more than it was a solution with the Federal holiday in 1933), but it gives additional time in which a solution may be found.

The Soviet Union 1992-3

The breakup of the Soviet Union's monetary union was, in many ways, similar to the breakup of the Austro-Hungarian Empire. This was a political and an economic breakup, side by side. Stamping, conversion, and economic and political strife were all part of the process. With the breakup of the Soviet Union in 1991, the Gosbank was replaced by fifteen separate central banks. The Central Bank of Russia had a monopoly over printing rouble notes.

The immediate post-Soviet Union breakup environment could be described as something approaching monetary anarchy. The Russians controlled the printing press, but the local central banks made no attempt to coordinate monetary policies. Credit expanded certain states, putting the system under pressure. The Russians responded by reducing the delivery of rouble notes in 1992 (a rather extreme method of limiting narrow money supply to try to control the broader monetary aggregates). There were also limits on the interstate payment system (effectively limiting the conversion of roubles from one state to another in the former Soviet Union).

The key consequence of the reduced physical money supply from Russia was an unwelcome shortage of cash in several territories. As a result parallel currencies or coupons were introduced (the Ukraine introduced coupons as early as November 1991, and Belarus introduced a coupon in May 1992, for instance).

In the latter part of 1992 Russia began to expand its own credit, and the process of separation was introduced. Estonia introduced the kroon as a parallel currency, which then *subsequently* became sole legal tender. The other Baltic states then followed. Ukrainian coupons morphed into legal tender in November 1992.

Russia then accelerated the process (and sought to prevent large numbers of notes being returned to it) by declaring in July 1993 that notes issued before 1993 would cease to be legal tender. Russian citizens could convert a fixed amount into the new currency. Above the limit money was deposited in accounts that would be blocked for six months (thus effectively subjected to an inflation tax, given the circumstances). Rouble notes printed in 1993 had not been

circulated outside of Russia, and so other members of the former Soviet Union effectively held worthless currency.

The Soviet Union collapse has few immediate parallels with the Euro area, given the relative levels of financial system sophistication, and the political structures of the time. However, the idea of voucher being printed within a monetary union (as took place prior to the breakup of the Soviet monetary union) is an interesting one. A similar "token" production process has been evident in Californian state IOUs.

Czechoslovakia 1993

The Czechoslovakian fragmentation in 1993 was relatively orderly, though the two components of the union experienced different political reactions (Slovakia moving towards a more authoritarian form of government in the immediate aftermath). It gives the Czechs and Slovaks the perhaps somewhat dubious distinction of having participated in two distinct monetary union fragmentations – 1919/20 and 1993.

With the general election of 1992 producing two different policy directions, the Czechs and Slovaks agreed to separate politically. Anticipating a break up of the monetary union, money began to flow from the Slovak to the Czech Republic; there was more confidence in the future economic policies of the Czechs (and their currency was ultimately expected to appreciate). In October, a currency union was announced (de facto a continuation of the existing currency union) for a minimum of six months from 1 January 1993. Announcing a brief monetary union of course, only served to hasten the flight of money from Slovakia (the aim being to get out before it was too late).

The Czech-Slovak monetary union was not an optimal currency area (no more, of course, is the Eurozone). There was low cross border labour mobility, and in spite of the lengthy integration as a single country under communism there were two distinct economic identities. Removing the fiscal union (with the political segregation into two units) therefore made the failure of the monetary union in economic terms a highly probable event.

Once it became obvious that the monetary union was doomed, capital flight across the border into Czech banks was overwhelming. The border between the two countries was sealed to prevent physical transfers, financial transfers were suspended, cash withdrawals from the banking system were limited, and in a move eerily reminiscent of the Austro-Hungarian collapse notes were once again stamped.

Again, there were limits on the amount of money that could be converted. Sums over a predetermined amount were converted into deposits.

The lessons for the Euro would seem to be not to preannounce a breakup, as it will only hasten speculation (this may be thought of as being a fairly obvious lesson and one that should perhaps be known *a priori*). The importance of limiting bank withdrawals (partially used in the case of the United States, of course) is also significant when there is a full scale physical transfer of money already under way.

History lessons

So what can history tell us about the break up of monetary unions that might have relevance to the Euro today? History has only a little to tell us. Fiat currency monetary unions are not that common in history, and their break ups are even less common. Most monetary unions hold together remarkably well – in large part because every successful monetary union has a fiscal union alongside to limit the economic damage of a shared monetary policy, and because there is normally a political union in operation as well. The economic and political consequences of a monetary union break up are also so severe as to deter all but the most determined – or to deter all but those already suffering extraordinary economic distress (occasioned by war or by depression). We would suggest four common trends emerge from the history books.

Common trends 1: Flight of capital

One, notable trend is that when a break up is anticipated, ordinary citizens are remarkably adept at moving their cash into what they perceive as the strongest successor state. The Austro-Hungarian experience demonstrates that most clearly, where citizens chose to not convert Crowns in their locale, and instead hold on to "unstamped" notes in the hope that they would be able to spirit them across the border to a stronger currency region to receive a different stamp at a later date. However, the US breakup also demonstrates this shift – with citizens believing that a dollar in New York was worth more than a dollar in Chicago (at least, when that dollar was deposited in the banking system). The flood of money across the Czech-Slovak border is another instance. This banking system shift was less in evidence in the Soviet breakup, perhaps because it was not immediately obvious which of the alternatives was likely to become the stronger currency.

The consequence of this capital flight is that the residual (perceived) stronger currency block in a monetary union fragmentation may actually end up with an inflation problem. At the very least there is a potential money supply based inflation threat. The Austro-Hungarian break up led to increased money supply flow into Hungary that created inflation during the break up episode. The flow into the Czech Republic in 1993 was relatively brief (given the short-lived nature of the union) but could have been inflationary if unchecked. The Soviet Union breakup was largely an issue of inflation pressures arising from narrow and broad liquidity creation and the potential for that to flow across borders in a monetary union.

The lesson for the Euro is that should it ever decide to embark on the suicidal course of a breakup, the banking system will be the first to show signs of the strain. Perhaps the positive signal at the moment, to counter those anticipating Euro breakup, is that ordinary citizens are not yet queuing outside banks in weaker countries to take possession of physical cash. The Euro area may want to consider limiting bank withdrawals if it starts the downwards spiral of a breakup.

Common trends 2: Seize your citizens' money

A further common trend is that breaking up a monetary union is also an ideal opportunity to seize the assets of your citizens (for the greater good, of course). The Austro-Hungarian enforced investments in bonds above a certain

conversion limit and the Russian deposits over a certain limit that were eroded by inflation are good instances of the government giving itself cheap funding or otherwise taxing the local population. The US monetary union breakup did not seize bank deposits, of course – though they were frozen for some considerable time in some states. What the US *did* do was seize specie (gold coin and gold bullion) from its citizens, which given the US was on the gold standard at the time, and that they devalued subsequent to nationalising gold holdings, is a not dissimilar method of taxation. The Czechoslovakian monetary union limited the amount of cash that could be converted at the outset of the breakup.

In a Euro breakup scenario precedent suggests that it is unlikely that either physical or bank holdings of cash would be exchanged into a new currency without some kind of "tax" being levied upon the asset. This is a means of financing government debt readily, and would be attractive to weaker economies seeking to exit the Euro. Of course, the fact that savings are being seized in this way is not likely to be popular with domestic citizens, which may create civil order consequences. Precedent also suggests that anticipation of this (and in particular, anticipation of which assets will be subjected to this tax) may encourage inflation (through a desire to hold physical goods) and selective asset bubbles in those assets that are believed to be likely to be exempted from the tax.

Common trends 3: Impose capital controls, seize foreigners' money

Fairly obviously, breaking up a monetary union requires capital controls to take place. The combination of capital flight with some kind of domestic tax on citizens' holdings of cash and other assets suggests that capital controls can be combined with a more significant tax on foreigners' assets in the seceding economy. Clearly this is less painful in terms of domestic political and social costs. It is also relatively easy to implement, as capital controls stop money leaving the country. Russia de facto imposed this with the break up of the Soviet Union with its repudiation of older bank notes not held by Russian citizens. Distinguishing foreigners from domestics was common in the break up of the Austro-Hungarian monetary union.

Common trend 4: Civil unrest or worse

Monetary union breakups, when they involve *fiat* currency, risk significant civil unrest. This is inevitable, perhaps. A fiat currency is based on trust in the government as the monopoly issuer of that currency. If trust in the currency is abrogated, then trust in the government (in the system of government) is likely to be similarly impaired. The economic circumstances that surround a monetary union breakup tend to be extremely severe, because the costs of a breakup are so high.

This means that at least some part of the monetary union is likely to be subject to risks of significant civil unrest. This could be met with a more authoritarian form of government, and that indeed has tended to be the response with monetary union fragmentations in past century. Civil war is also, however, a possibility given that political unity is often called into question.

The paucity of evidence

Because the economic, social and political costs of a monetary union breakup are so considerable, breakups are not that common. As a result, there is a limited

data pool from which to extrapolate – particularly when we seek to concentrate on the fiat currency monetary unions that are most relevant as parallels today. Extrapolating from, essentially, four data points is not something economists are ever going to be entirely comfortable with.

Perhaps the best examples of the consequence of a monetary union breakup are to be found, not in breakups themselves (the instances being so rare) but in parallel instances. Our assessment, in "Euro breakup – the consequences" used Argentina's de-pegging of the peso from the dollar in 2001 as one case study from which to draw lessons. Another parallel to a Euro break up, in terms of the consequences of breaking faith in a fiat currency, maybe the hyperinflation episodes of Zimbabwe or Weimar Germany. The growth consequences we envisaged were not too dissimilar in scale from the scenarios we have posited for a Euro breakup.

Monetary Union Breakups: Summary

Name	Countries	Collapse	Fiat currency?	Single interest rate?	Capital controls?	Single currency	A "proper" monetary union?
American colonies	New England colonies	1744	Yes (sort of)	No	Introduced at break up	No	No
America 1779-1865	United States	1861	Not as legal tender until breakup	No	No	Yes (specie) no (fiat)	No
Latin Monetary Union	France, Italy, Switzerland, Belgium, Spain, Greece.	1871-8 (de facto) or 1927 (de jure)	No	No	No	No	No
Scandinavian Monetary Union	Sweden, Norway, Denmark	1905	Yes	No	No	No	No
Austro-Hungarian monetary union	Austria, Hungary, other states	1919	Yes	Yes	Yes	Yes	Yes
America 1914-1932	United States	1932	Yes	Yes until break up	Introduced de facto 1932	Yes	Yes
Soviet Union	Former Soviet Union	1992/3	Yes	Yes under USSR, no post USSR	Yes	Yes	Yes
Czech-Slovak	Czech Republic, Slovakia	1993	Yes	Yes	Introduced at break up	Yes	Yes

Source: UBS

Selected UBS research on the Euro

Deo, "Yes, Greece could devalue (while staying in the euro)" 20 July 2011

Deo, Donovan, Hatheway "Euro breakup the consequences" 6 September 2011

Deo, Lueck, Cominetta, Miller "Euro crisis : Crunch-time nearing?" 8 July 2011

Deo, Lueck, Cominetta, Miller "Where is Europe heading?" 10 December 2010

Donovan "Could Germany leave the Euro?" 30 November 2010

Donovan "A Euro Sovereign default – what would it mean?" 9 November 2010

Deo, Lueck, Cominetta, Miller "Fiscal integration" 28 May 2010

Donovan, Hatheway, Deo "How to break up a monetary union" 24 February 2010

Deo "Can Greece default?" 1 December 2009

Chapman, Deo, Donovan, "European Sovereign Default and Euro Break Up? – Conference Call Transcript" 28 January 2009

Donovan, Deo, Constable "Breaking up is hard to do: the Euro and the credit crisis" 13 November 2008

Deo "EMU divergence, not breakup" 4 April 2008

Hatheway, Cates, Donovan "'No': What does it mean?" 2 June 2005

Donovan "Diverging European Bonds: Sovereign credit ratings under EMU" 16 December 1998

Donovan "When inflation is (relatively) good for bonds" 22 July 1998

Magnus, Donovan "European bond markets under EMU" 8 August 1997

Magnus, Donovan "Labour markets and EMU" July/August 1996

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