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Eurosystem debts do matter

Since September 2015, the European Central Bank has been publishing Target2 balances – the debts between the national central banks of the eurozone. But this presents an incomplete picture of intra-eurosystem debts because it does not include those arising from the issue of banknotes.

The ECB also plays down the importance of Target2 debts as a “*normal feature of the decentralised implementation of monetary policy in the euro area*”. But if Greece were to leave the euro and its eurosystem debt (currently €98bn) were written off, other eurozone countries would bear the loss, in addition to losses on official loans.

The irremovable flaw in the structure of the eurosystem is that there is no effective mechanism for limiting eurosystem debts. And exit risk – the risk that Greece or some other eurozone country with large eurosystem debts will leave the euro – will always be present.

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<http://www.lancs.ac.uk/staff/whittaj1/EurosystemSept16.pdf>

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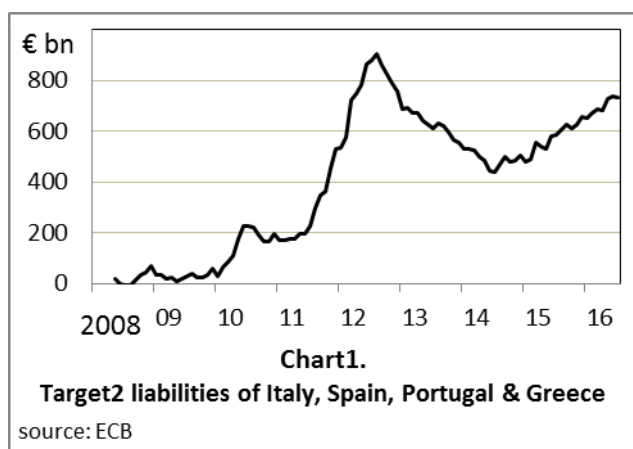
Intra-eurosystem debts

Target2 balances

An essential feature of European monetary union is that each national central Bank (NCB) in the eurosystem can borrow from the others. This is necessary for clearing cross-border payments through the banking system. If a deposit is moved from a Greek bank to a German bank, for instance, the Greek bank makes up for its lost deposit by borrowing more from its NCB (the Bank of Greece, BoG); the current account of the German bank at its NCB (the Bundesbank) is credited; and the Bundesbank acquires a claim on the BoG. The accumulation of these debts between the NCBs are the Target2 balances which the ECB (2015) has now begun to publish.

The broad features of the Target2 balances are that 'core' countries such as Germany have claims, whilst the greatest liabilities are those of the 'peripheral' countries Italy, Spain, Portugal and Greece, largely caused by capital flows from the periphery to the core since 2008. Chart 1 shows the combined Target2 liabilities of these four countries, which reached a peak in mid-2012 then fell until mid-2014.

It has been rising again since then, mainly driven by renewed flows out of Italy and Greece.



Euro banknotes

Cross-border payments can also be made by drawing banknotes from banks in one eurozone country and depositing them in another, and this is another source of intra-eurosystem debts. Banks in each euro country obtain their banknotes from their NCB and, to account for cross-border movements, each NCB is allocated a

¹ An NCB's 'banknote allocation key' is 92% of its capital key with the remaining 8% allocated to the ECB.

proportion of the total stock of eurozone-wide issue outstanding at any time, according to its share in the capital of the ECB (its 'capital key').¹ If the value of banknotes issued by an NCB exceeds its allocation, this excess is recorded as a eurosystem liability, and an NCB that has issued less than its allocation has a eurosystem claim. As an example, if €100 of banknotes is drawn in Greece and deposited in Germany, the total issue is unchanged and allocations are therefore unchanged, but Greece's eurosystem liability rises by €100 while Germany's claim rises by €100.

The increase in a country's eurosystem liability (or decrease in its claim) is thus equal to net cross-border out-payments via banks and banknote movements, which could be current account payments or capital outflows unrelated to trade.²

Table 1. Intra-eurosystem claims

	December 2015		€ billions	
	Target2	banknote ¹ adjustment	total	total as % of GDP
Austria	-29.2	28.2	-0.9	-0.3
Belgium	-7.8	11.9	4.1	1.0
Finland	20.1	4.0	24.1	11.7
France	-29.2	88.0	58.8	2.8
Germany	584.2	-297.8	286.4	9.8
Greece	-94.4	-19.6	-114.0	-64.2
Ireland	-3.0	-16.3	-19.3	-10.2
Italy	-248.9	32.3	-216.6	-13.4
Luxembourg	147.6	-92.7	54.9	112.3
Netherlands	54.7	44.7	99.4	15.0
Portugal	-61.7	34.7	-27.0	-15.5
Spain	-254.1	83.7	-170.4	-16.4
ECB	-83.8	86.7	2.9	
others	5.3	12.2	17.5	
sum	0.0	0.0	0.0	

Negative numbers indicate amounts owed to other NCBs.

¹ An NCB with a negative banknote adjustment has issued a greater value of banknotes than its allocation.

source: ECB (Target2); NCBs (banknote adjustment).

² The increase in a country's eurosystem liability is identically equal to its overall balance of payments deficit, if the balance of payments is defined to include the current account and all capital flows excluding changes in the eurosystem balance of the NCB. Appendix 1 gives relevant accounting identities.

Table 1 shows current intra-eurosystem balances, including both Target2 balances and banknote adjustments.³ The banknote adjustments, which have built up more gradually since each country joined monetary union, make considerable differences to overall intra-eurosystem debts.⁴ For instance, Germany's negative banknote adjustment offsets more than half of its Target2 claim.

Risks

Should Germany and the other creditor countries be concerned about their eurosystem exposures? If Greece left the euro and the BoG did not pay off its eurosystem debt, the resulting loss would be shared among the NCBs of the other euro countries in proportion to their capital keys.⁵ The Bundesbank has the largest capital key (25.6%) and so it would suffer the largest loss. All profits and losses of the Bundesbank accrue to the German government; hence, if the Bundesbank were to write off part of its eurosystem claim, this would be a loss for German taxpayers.⁶

For these reasons, while eurosystem debts are formally debts between NCBs, they are properly considered as debts between respective governments. This applies to eurosystem debts arising from both payment channels: cross-border transfers via the banking system (Target2 debts) and payments via banknote movements, despite the fact that the ECB has chosen to publish only the Target2 component.

The ECB (2015) plays down the importance of Target2 debts (and, by implication, total intra-eurosystem debts of each country which include the banknote adjustment), describing them as a

“normal feature of the decentralised implementation of monetary policy in the euro area.”

³ We disregard NCB claims on the ECB resulting from foreign assets transferred to the ECB (a total of €40.5 at end 2014, allocated across the NCBs according to their capital keys).

⁴ Further discussion of the pattern of euro banknote issues and more detail of the accounting practices appear in Whittaker (2011).

⁵ The eurosystem balances of NCBs are considered as liabilities to or claims against the ECB, but the shareholders of the ECB are the NCBs themselves. For a description of the accounting see, for instance, [ECB Annual Report](#), December 2015, page A23.

⁶ Even in an uncooperative departure of a country from the euro, some recovery of its eurosystem liabilities might be expected. Legally, the ECB could seize the collateral security held by the NCB against its refinancing but this would be unlikely to cover more than a fraction of losses.

Further, (ECB, 2013)⁷

“- the size of the TARGET balances does not pose additional risk to the Eurosystem or the NCBs given the irreversibility of the euro - -“

However, the euro is not irreversible. Indeed, we argue below that exit risk is an unavoidable feature of monetary union. Thus, if a country's eurosystem debt presents a risk when it leaves the euro, and if there is a non-zero probability that it will leave, then its eurosystem debt is risky. A contingent risk is a risk.

Eurosystem debts are a peculiar form of debt with no contract or understanding about the terms of repayment⁸. This implies that an NCB cannot default on its eurosystem liability because it has no obligation to repay.

A country's intra-eurosystem liabilities are nonetheless loans from other countries. For a country that has received official loans, its intra-eurosystem liabilities should therefore be added to its official loans when assessing the risk exposure of the creditor countries.

Greece's public debt

As an example, the progress of the public debt of Greece since 2008 is shown in Chart 2, where we define public debt to include the eurosystem liabilities of the BoG, official loans to the Greek government and outstanding government bonds. Greece's public debt to foreign governments, shown as the solid line, stood at €346bn in June 2016⁹.

As a result of capital flight, the Target2 debt of the BoG had already reached €80bn by May 2010. Thus, the Greek state was already enjoying a 'loan' of €80bn from other eurozone governments via their NCBs,

⁷ Similar statements appear elsewhere, for instance Bundesbank (2011).

⁸ This contrasts with the US where there is annual settlement of the inter-district balances of the Feds (Federal Reserve Banks), using Federal government debt or agency debt. The US system also differs from the eurosystem in that the Feds are not associated with states: each Fed deals with banks in several states and Fed profits go to the US government. Intra-eurosystem settlement would be infeasible because debtor NCBs do not have sufficient suitable assets.

⁹ Note that official loans are reported at their nominal values, which is a poor indicator of their sustainability, given the reductions in interest rates and extensions of maturity. The ESM ([annual report 2014](#), page 30) estimates that these concessions have reduced the NPV of EU loans to Greece by 49% of 2013 GDP, which amounts to €89bn.

even before it received any official loans. Then in May 2010, Greece began to receive tranches of official loans under the first bailout programme from the EU and the IMF, which arrested the rise of the BoG's Target2 debts. When the government of Greece receives a tranche of a loan, this capital inflow causes an equal reduction in the Target2 liability of the BoG, leaving the overall exposure of creditor governments to Greece unchanged (appendix 1). The debt merely becomes routed through the IMF or an EU fund (e.g. the European Financial Stability Fund) rather than through the NCBs.

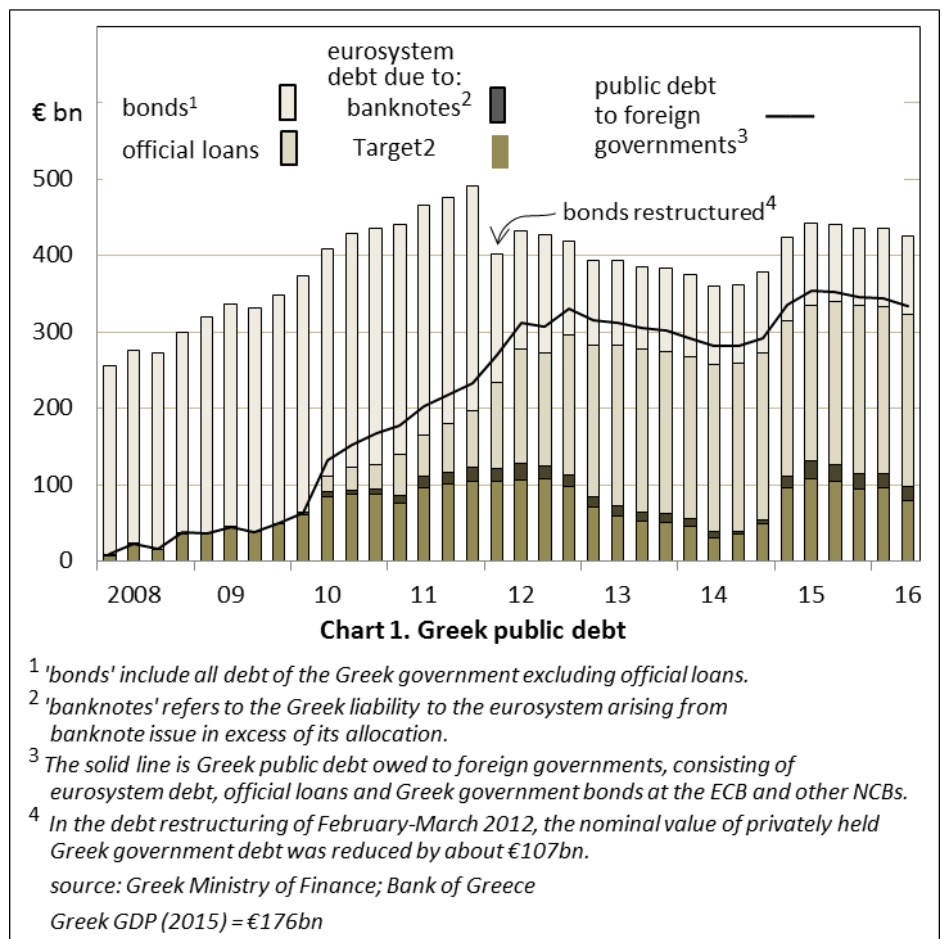
Private funds continued to leave Greece until mid- 2012, as rising yields on Greek government debt indicated fears of default and/or departure of Greece from the euro. A major component of the withdrawals was by foreign banks (see Merler, 2015). But

instead of causing higher Target2 debt, those outflows were mostly offset by further inflows of official loans. At the same time, there was a marked rise in banknote issue by the BoG, for hoarding and/or as a means of sending funds out of the country.

The outflows reversed in late 2012 following the ECB's promise to purchase government debts (Outright Monetary Transactions, OMT, described below). This set the Target2 balances of all the peripheral countries on a downward path as private funds returned, responding to reduced fears of sovereign defaults and euro-exit. In April 2014, the Greek government was even able to issue €3bn of new 5-year debt at only 5% yield.

From September 2014 to June 2015, the eurosystem debt of the BoG rose again as a result of capital outflows during the protracted negotiations between the Greek government and its creditors, while inflows of official loan funding ceased.

Greek eurosystem debt at the end of June 2015 was €130bn, (similar to the peak of €128bn in June 2012). It has since receded to €98bn (July 2016), mainly a result of loans received under the latest bailout package; excess banknote issue accounts for €18bn of this total.



Eurosystem debts

should have been restrained by the collateral requirements for refinancing

The experiences of Greece and other peripheral eurozone countries since 2008 invite consideration of the mechanism that should have restrained the growth of intra-eurosystem debts.

No central bank, in any monetary system, lends to its banks unsecured. In the eurosystem, the routine provision of liquidity by NCBs to banks (refinancing) is via repurchase agreements in which the NCB lends to banks against collateral approved by the ECB. But it is costly to tie up assets as collateral for NCB refinancing. Hence, this collateral framework should have given an incentive for banks requiring liquidity to seek cheaper borrowing in the interbank markets.

This incentive appears to have been effective until 2008 as Target2 balances across the eurozone remained generally small.¹⁰ Although there were

¹⁰ The ECB (2015) notes that total Target2 claims before mid-2007 were around €100bn; by mid-2012 they had risen to over €1,000bn.

sizable current account deficits in several peripheral countries, these were approximately matched by investment inflows and lending from core to peripheral banks (ECB, 2013).

After 2008, the financial crisis brought substantial capital flight from the periphery to the core, while cross-border interbank markets dried up as a result of counterparty risk.¹¹ As deposits were withdrawn from banks in the periphery and transferred to banks in the core, this led to increased liquidity provision by the peripheral NCBs, with corresponding reductions in liquidity provision by the core NCBs (or increases in the core banks' deposits at their NCBs). In turn, the periphery NCBs built up increasing Target2 debts to the core NCBs, which still largely persist (table 1).

To enable the periphery NCBs to continue providing liquidity, the ECB's collateral standards were progressively relaxed. Among the measures adopted, minimum credit ratings for government debt and other securities were reduced several times, banks own-issued bonds with a government guarantee were accepted, and very long maturity refinancing was offered under advantageous terms.¹²

Instead of serving to restrain the growth of intra-eurosystem balances, the rules for refinancing were eased as necessary to allow the balances to grow unhindered. When the quality of available collateral became so poor that further easing could no longer be justified, the ECB has always permitted NCBs to extend Emergency Liquidity Assistance (ELA) where the NCB itself approves the collateral and the risk is purportedly borne by the NCB (and thereby the relevant government) rather than pooled via the ECB.¹³

¹¹ *A recovery of the unsecured short-term (less than 30-day) interbank market is unlikely even as counterparty risk recedes, given the Basel III liquidity coverage rules (BCBS, 2013) which require banks to hold 100% statutory liquid assets against such borrowing*

¹² *The ECB also had to change to 'full allotment' (satisfying all banks' demands for liquidity in full), because the 'normal' auction system in which supply was limited to net eurozone-wide demand had relied on functioning interbank markets to distribute the liquidity. Sinn (2014) provides a thorough analysis of the eurosystem, including detail of the decline of collateral standards.*

¹³ *The ECB's [ELA procedures](#) permit temporary ELA to solvent banks, provided that this does not "interfere with the objectives and tasks of the Eurosystem". This gives latitude for judgement and interpretation, as discussed by Whelan (2015).*

The ECB has always been keen to signal that permission for continuing ELA should not be taken for granted. For example, as deposits were withdrawn from Greek banks during the negotiations in 2015 over the third bailout, the ECB permitted the value of ELA granted by the BoG to rise in a series of small increments that were just sufficient to allow the banks to remain liquid. But the cap always stayed ahead of demand: it was never binding.

Continuing liquidity support is necessary for countries to remain in monetary union (see appendix 2). Monetary union cannot be made to function as originally intended, with intra-eurosystem balances restrained by rigid rules governing central bank liquidity supply.

Asset purchases

have reduced the banks' need for liquidity

As this behaviour illustrates, the ECB has two conflicting objectives. On the one hand, it is supposed to allow NCB lending only to solvent banks and against high-quality collateral. On the other hand, it has a treaty responsibility 'to promote the smooth operation of payment systems'¹⁴, which means the NCB lending tap must remain open. Irrespective of treaty commitments, the ECB would not welcome the political fallout if it caused a country to be expelled from the euro by failing to provide enough liquidity.

This is the dilemma that caused the ECB to relax its collateral standards. It also gives the ECB an incentive to find ways of holding back the banks' demand for liquidity.

While the various asset purchase programmes were designed to reduce sovereign yields and stimulate economic growth, central bank asset purchases also directly reduce the banks' need for liquidity. If the stimulus serves to arrest capital flight, a further helpful result is a reduction in eurosystem liabilities.

Eurozone asset purchases began with the Securities Market Programme (SMP) of 2010-12, in which the NCBs bought over €200bn of peripheral government debt.¹⁵ However, any useful effects from this initiative were transitory and yields and eurosystem liabilities continued to rise.

¹⁴ *Article 127(2) of the Treaty on the Functioning of the European Union.*

¹⁵ *The SMP purchases were initially of the government debts of Greece, Ireland and Portugal, then later of Spain and Italy. The ECB has published [details of holdings](#) as at 31 December 2012.*

Then, at the height of crisis in mid-2012, the ECB President declared that the ECB would

“do whatever it takes to preserve the euro”,

later specified as a conditional promise to purchase government debt (named Outright Monetary Transactions: OMT), as necessary - -

“to address severe distortions in government bond markets which originate from, in particular, unfounded fears on the part of investors of the reversibility of the euro.”¹⁶

Asset purchases under this OMT programme, which would be essentially the same as SMP purchases, have never been carried out. However, the commitment to do so has largely been given the credit for bringing down sovereign yields and reversing capital flight.¹⁷

A new asset purchase programme began in March 2015 which mostly consists of purchases by NCBs of their own government debt, up to a total of €60bn per month, since raised to €80bn.¹⁸ This amount is spread across countries according to their capital keys, (excluding Greece because of the poor rating of its government debt). The intention to provide economic stimulus and to raise inflation rates, emulating quantitative easing as practiced elsewhere.

Regardless of the success or otherwise in providing stimulus, these purchases have had the benign effect of reducing the need for refinancing in peripheral countries. In Italy, for instance, the purchases have enabled capital flight to continue (and Italy's Target2 liability to rise) without adding to Italian bank refinancing. But they have had the adverse effect in core countries of increasing banks' excess reserve balances which currently suffer from the ECB's negative 0.4% interest rate.

Bailout loans

have displaced Target2 liabilities

What happens when lending by a country's NCB to its banks becomes so large and/or the quality of the

banks' remaining collateral becomes so poor that the ECB finds it hard to justify continued lending, even via ELA? The official loan programmes for the governments of Greece (2010, 2012 and 2015), Ireland (2010), Portugal (2011) and Cyprus (2013) can be seen as an attempt to address this problem.¹⁹

First, a large part of banks' collateral typically consists of government debt and government-guaranteed debt. The ECB used the commitment of the above countries to the conditions of their loan programmes as a basis for condoning continued lending against these assets when sovereign ratings had been downgraded to 'junk'.

Second, by supporting government budgets (and banks), official loans should help to hold back capital flight and thereby restrain the banks' demand for liquidity, in the same manner as the asset purchase programmes.

Third, as noted above for the case of Greece, the receipt by a country of a tranche of a loan causes an equal reduction in lending by that country's NCB to its banks, and in the Target2 liability of the NCB (appendix 1).

In other words, official lending displaces lending via the eurosystem: one form of bailout is displaced by another. However, while official loans and lending via the eurosystem both represent exposure for the creditors, the important difference is that all official loan programmes have included 'austerity' conditions. These have invariably required budget deficit reduction (which the Stability Pact rules failed to deliver) and structural reforms intended to improve governance and competitiveness, with the payment of each loan tranche dependent on the continuing fulfillment of the conditions by the recipient government.

The objective of these conditions may be seen as making governments better able to repay the loans. But the total stock of government borrowing from other eurozone governments, including official bailouts and eurosystem debt, can only fall as private

¹⁶ [ECB press statement](#), 6 September 2012.

¹⁷ *Buchheit and Gulati (2012) have pointed out that, if an OMT purchase programme were ever commenced, there might not be enough political support to enable the programme to remain credible.*

¹⁸ *'Monetary financing' (central bank lending to governments) is prohibited by treaty (article 123 TFEU). However, all these actions are purchases by NCBs of government debts in the secondary markets which, in the case of OMT, has been condoned by the [European Court of Justice](#).*

¹⁹ *It is commonly argued that the motive for the 2010 Greek bailout was to save private creditors, particularly French and German banks (e.g. Mody, 2015). This is not inconsistent with the view that the purpose was to give the ECB cover for the continuation of liquidity provision, as both of these motives can be construed as preserving the fragile 'financial stability' of the eurozone. Davies (2015) notes that a default by the Greek government would have ruined Greek banks, which also had large holdings of Greek government debt.*

funds flow in as a result of a current account surplus or inward investment.

Even if the Greek government runs large budget surpluses which it uses to repay its official loans, this will merely cause an equal rise in its eurosystem (Target2) debt, unless the budget surpluses induce private financial inflows (appendix 1).

While 'austerity' may be given the credit for turning round the Irish economy, the loan programmes for Greece have been notably unsuccessful and there has been mixed success elsewhere. The argument has been made (*e.g.* Varoufakis 2015) that austerity in Greece may have improved economic efficiency and budget balances, but the dominant effect has been to depress economic activity and create political instability, making the repayment of loans less likely.

The IMF has received repayment of its share of official loans as they have matured. However, there have been no repayments so far of the larger loans from EU funds. Instead, the repayment terms for the EU loans to Ireland, Portugal and Greece have been considerably eased, both by reducing interest rates and pushing payback dates well into the future. The average residual maturity of EU funds lent to Greece under the first two loan programmes (€184bn) is now around 30 years (EFSF, 2015; ESM, 2014).

The net result is that one form of lending that Greece has no obligation to repay (eurosystem liabilities) has been partially replaced by another where repayments are not due for 30 years (official loans). There is not much difference.

The euro as a fixed exchange rate regime

If Greece had kept its own currency (drachma) and fixed its exchange rate to the euro, the outflow of foreign (euro) reserves from the BoG would long ago have forced it to abandon the fix.

But under monetary union, the 'fix' (of the value of euros in banks in one country to those in another) is maintained by the commitment of all NCBs to accept unlimited intra-eurosystem claims against each other. A country's NCB does not need to be concerned about keeping 'foreign' reserves to maintain its fixed exchange rate, because other NCBs automatically lend to it as necessary.

This structure has a problem. When a country fixes its currency against some different currency, its government has an incentive to avoid policies such as large budget deficits that lead to financial outflows

and the depletion of its central bank's foreign reserves. In monetary union, this incentive is absent as there is no corresponding limit to the growth of eurosystem balances.

In its place, eurosystem liabilities should have been restrained by the collateral requirements for NCB lending to banks but, as discussed above, these requirements have always been diluted as necessary to allow NCB lending to continue, or lending has been allowed via ELA. And the Stability Pact rules which should have restricted budget deficits have not been consistently applied. For those countries that have received official loans, the 'austerity' conditions attempt to reproduce the incentive for prudent fiscal behaviour which exists naturally under a fixed regime.

In the absence of effective restraints on the rise of eurosystem liabilities, there is nonetheless a disciplining force. That is the threat of expulsion from monetary union. A fixed exchange rate breaks when the country defending it runs out of foreign reserves; monetary union breaks when the country is denied eurosystem credit.

Exit risk

The departure of any country from monetary union would involve large political and financial costs and uncertainty, particularly for that country but also for other eurozone members, given the absence of agreed exit procedures. This makes monetary union more durable than a fixed rate regime between separate currencies.

Yet, there must be a limit to the tolerance of creditor countries. There must be some threshold level of exposure to Greece or any other debtor country, or expected future exposure, beyond which Germany and the other creditors would refuse further credit (either via the eurosystem or official loans), accept their losses, and expel.

Despite the ECB's assertion that monetary union is irreversible, exit risk will always be present, just as it is in any ordinary fixed exchange rate regime. The difference with monetary union is that it raised the stakes by cementing all financial claims into a 'foreign' currency.

The Greek government is aware of the costs of exit. Indeed, the fear of being deprived of ELA and forced out of the euro was the main reason why it accepted the conditions attached to the latest bailout. Likewise, it was the threat to cut ELA that persuaded the Irish

government to accept an official loan programme in November 2010²⁰ and the Cypriot government to accept a programme in March 2013.

Exit risk for Greece has receded since the agreement of August 2015. And exit risk for other countries is lower than it was in 2012 thanks to the OMT promise and, more recently, the latest asset purchase programme.

But exit risk has not gone away. The next country to see rising exit risk, along with accelerated capital flight and higher sovereign yield spreads, might not be Greece. It could be any of the peripheral eurozone countries which still have large eurosystem liabilities and government debts relative to GDP, ongoing concerns about their banks, and uncertain politics.

²⁰ In [letters](#) to the Irish government in November 2010, the ECB explicitly threatened to cut liquidity to Irish banks unless the Irish government agreed to a programme of financial support.

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Appendix 1: The public debt of Greece to foreign governments: accounting identities

We are interested in the exposure of foreign governments to Greek 'public debt', defined as the debts of both the government and the BoG. Then, as illustrated in Figure 1:

$$\begin{aligned}
 &\text{Equation (1)} \\
 &\text{Public debt of Greece to foreign governments } (A) \\
 &= \left\{ \begin{array}{l} \text{Greek government bonds held by the ECB} \\ \text{and other NCBs}^1 (B) \\ + \text{ outstanding EU and IMF loans to} \\ \text{the Greek government } (C) \\ + \text{ the eurosystem liability of the BoG} \\ \text{(owed to the ECB)} (D) \end{array} \right.
 \end{aligned}$$

where the debt to the ECB is included because the ECB is owned by NCBs and the profits and losses of each NCB accrue to its government.

The balance of payments identity

An increase in the eurosystem liability of the BoG, (arising both from bank transfers and banknote movements) is equal to the overall balance of payments deficit, which may be decomposed as:

$$\begin{aligned}
 &\text{Equation (2)} \\
 &\text{Increase in eurosystem liability of the BoG } (\Delta D) \\
 &= \left\{ \begin{array}{l} \text{net private financial outflows} \\ + \text{ repayments less receipts of loans } (-\Delta C) \\ + \text{ net redemptions of ECB-held Greek} \\ \text{government bonds } (-\Delta B) \\ + \text{ interest on public debt to foreign govts} \end{array} \right.
 \end{aligned}$$

where private financial outflows comprise current account payments and capital outflows² unrelated to trade, including net purchases by the Greek private sector of foreign-held securities.

Equations (1) and (2) imply:

$$\begin{aligned}
 &\text{Equation (3)} \\
 &\text{Increase in public debt to foreign govts } (\Delta A) \\
 &= \left\{ \begin{array}{l} \text{interest on this debt} \\ + \text{ net private financial outflows} \end{array} \right.
 \end{aligned}$$

These identities show:

1. Capital flight from Greece:

Capital flight (net private outflows) causes an increase in borrowing of the BoG through the eurosystem (ECB), unless this is offset by official loans to the government (eqn. 2). In other words, private exposure to Greece is converted into exposure of other governments to Greece through the eurosystem.

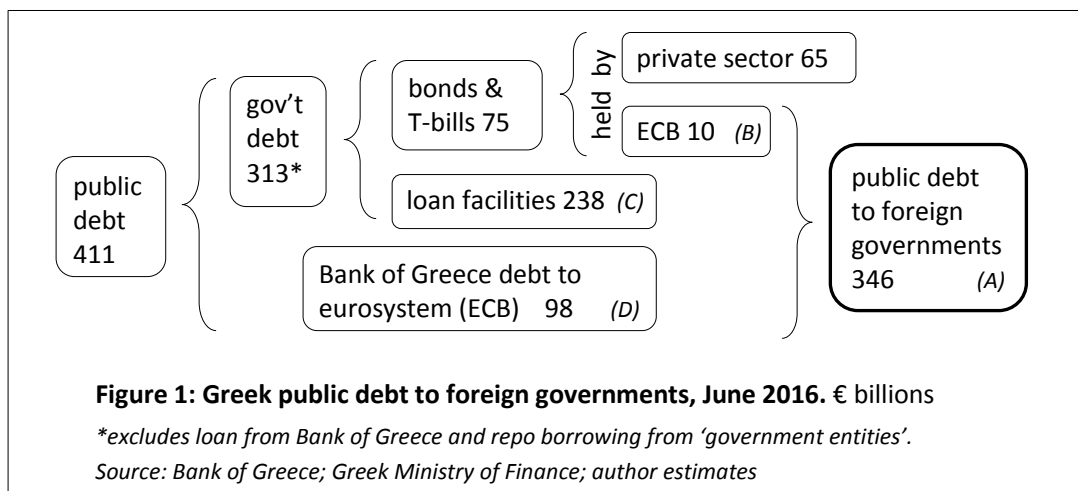
2. Repayment of Greek public debt to foreign governments:

Barring default or forgiveness, the total of Greek public debt to foreign governments can only be reduced by private financial inflows, *i.e.* by current account surpluses or net inward investment (eqn.3).

In the absence of private financial flows, the redemption of a Greek government bond held by the ECB or the repayment of a loan to the EU or the IMF causes an identical increase in the eurosystem (Target2) debt of the BoG to the ECB (eqn. 2). The same applies to payments of interest on ECB-held government bonds and official loans.

¹ Bonds purchased under the SMP programme.

² 'Capital flows', as used herein, include both the 'capital account' and the 'financial account' of the balance of payments as named under the accounting practices of the EU and the IMF.



Appendix 2: The meaning of ‘in the euro’

In considering exit risk – the risk that some country will leave the euro – it is helpful to clarify what defines a country as being ‘in the euro’ or ‘in monetary union’.

Any country can use the euro as its currency without being a member of monetary union, existing examples being Kosovo and Montenegro. The ability of these ‘euroised’ countries to use euro banknotes and to make foreign payments depends on their central banks keeping sufficient stocks of foreign assets, the same condition that would apply if these countries had their own currencies but held a fixed exchange rate against the euro.

The distinguishing feature for a country that is a member of monetary union is that its national central bank (NCB), on behalf of its banks, can obtain banknotes and make foreign payments by borrowing from the ECB and other NCBs in the eurosystem. We shall therefore take this as the necessary and sufficient condition for a country to be in monetary union: that its banks have access, via its NCB, to eurosystem credit.

However, while NCB borrowing from the eurosystem is unconditional, the NCB’s supply of liquidity to its banks (by refinancing or ELA) is subject to collateral requirements. The implication is that a bank would have to close if its liquidity need were greater than the value (after haircuts) of its stock of eligible collateral assets.

In principle, NCB liquidity could be withdrawn from an *individual* bank without implication for membership of monetary union for the country in which the bank resides. However, during the financial crisis, *all* banks in certain eurozone countries lost deposits due to capital flight, and continued membership of monetary union meant that they *all* needed more NCB-supplied liquidity. To meet that general need, the collateral rules were weakened and ceilings on liquidity supply were raised as necessary. Despite several occasions on which the ECB has threatened to restrict liquidity supply, it has always been sufficient to meet demand.

Granted, at the end of the recent Greek negotiations, this was only achieved with the aid of capital controls. When the Greek government called a referendum on the bailout package on 27 June 2015, the ECB declined Greek requests for further increases in the ELA ceiling. The Greek authorities then declared a bank holiday during which cash withdrawals from ATMs and foreign payments were still permitted but under strict limits. This held back capital flight enough for the demand for liquidity to stay below the ceiling. The liquidity tap remained open and Greece has stayed in the euro.¹

If the BoG had reached the ECB-imposed ceiling on its ELA, the only liquidity that the BoG would have been able to supply to the banks would have been claims against itself (new drachma) with no guarantee of convertibility into euros². And the only way that banks could have met all demands for deposit withdrawal – the only way to stay open – would have been by using the new currency. Whatever the precise arrangements to issue new banknotes and to redenominate claims into the new currency, Greece would no longer be in monetary union.

To sum up, if a country is ‘in the euro’, this requires the supply of eurosystem credit to its banks to be determined by demand. Conversely, if a country loses access to eurosystem credit, it is expelled from the euro.

¹ *This illustrates (as in the case of Cyprus in 2013) that a country can remain in monetary union with capital controls in place. However, with capital controls, euro deposits in Greek banks would tend to be less valuable than euro deposits in banks elsewhere, just as capital controls under a fixed exchange rate regime lead to an informal foreign exchange market in which the exchange rate may differ from the official rate.*

² *We disregard the possibility that the BoG might defy the ECB and supply euro liquidity to its banks in excess of the ceiling, on the presumption that the ECB and other NCBs would then restrict the BoG’s access to eurosystem credit, implying non-settlement of cross-border payments and non-supply of euro banknotes to the BoG. This would force the BoG to restrict euro liquidity to its banks, which is the same outcome as if the BoG had adhered to the ceiling.*