Understanding TARGET2 imbalances from an endogenous money view.[1]

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1. Introduction.

The Euro Zone (EZ from now) is going through troubled times. Its problems are the consequence of accumulated current account imbalances since the launch of the euro which, in turn, were caused by two complimentary though unsustainable growth patterns implemented in the core and the peripheral countries of the EZ (see Hein *et al*. 2011, Uxó *et al*. 2011). Until mid 2007, current account deficits in the periphery were covered with financial account surpluses, leading to the piling up of negative net international investment positions (NIIP onwards), mirrored by positive NIIP in the core EZ countries. However, since then, massive capital flows have been observed from the periphery towards the core EZ. Therefore, one might think of a balance of payments problem within the EZ.

It is common knowledge that, under a fixed exchange rate regime, a country can endure a balance of payments crisis whilst it holds valuable international reserves. However, conversely to a pegged exchange rate system, the EZ is a monetary union. This fact has had serious consequences for the unfolding of the crisis in the EZ, because there are several fiscal authorities but only one single monetary authority, which should be concerned with the smooth running of a payment system and providing access to refinancing funds on the same footing to all banks within its jurisdiction. The crucial difference, as Bindseil and König, 2012, p. 138 point out, is that "cross-border payments within the monetary union were from [the onset of the monetary union] treated as payment flows within the borders of a single country".

This difference is relevant because capital flows are taking the form of cross-border bank deposit transfers when the interbank money market has almost collapsed and fragmented. In this situation, the Eurosystem has been forced to provide all the required funds to monetize such capital flows, through national central banks (NCBs onwards) and channeled through the so called TARGET2 system (T2 onwards), leading to huge imbalances between NCBs and the Eurosystem.

Hans Werner Sinn, the president of the Ifo Institute, has broadcasted to all and sundry the message that the ECB has bailed out countries holding T2 liabilities, allowing them to avoid the usual painful measures that balance of payment crisis imposes on debtor countries. Moreover, nations holding T2 claims are at risk because those assets are seriously exposed to a capital loss risk in the event of a euro breakup.

In this paper, we provide a description of the working of the T2 system, within the frame of the monetary policy implementation at the EZ level. Then, we discuss whether these T2 imbalances are a bail out of the periphery by the Eurosystem, and funded in the last instance

[1] Earlier versions of this paper were presented at the "Congreso Internacional Crítica de la Teoría Económica y políticas alternativas frente a la crisis global", UNAM, México, and the "XIII Jornadas de Economía Crítica", Sevilla.

with savings from the core EZ, and whether these imbalances pose a true risk for the German economy. We conclude that those statements, the bailout view and the risk for Germany, voiced by Hans Werner Sinn, from the Ifo Institute, in the media and in academic papers are incorrect.

2. TARGET2 System. How does it works? An illustration of the issue.

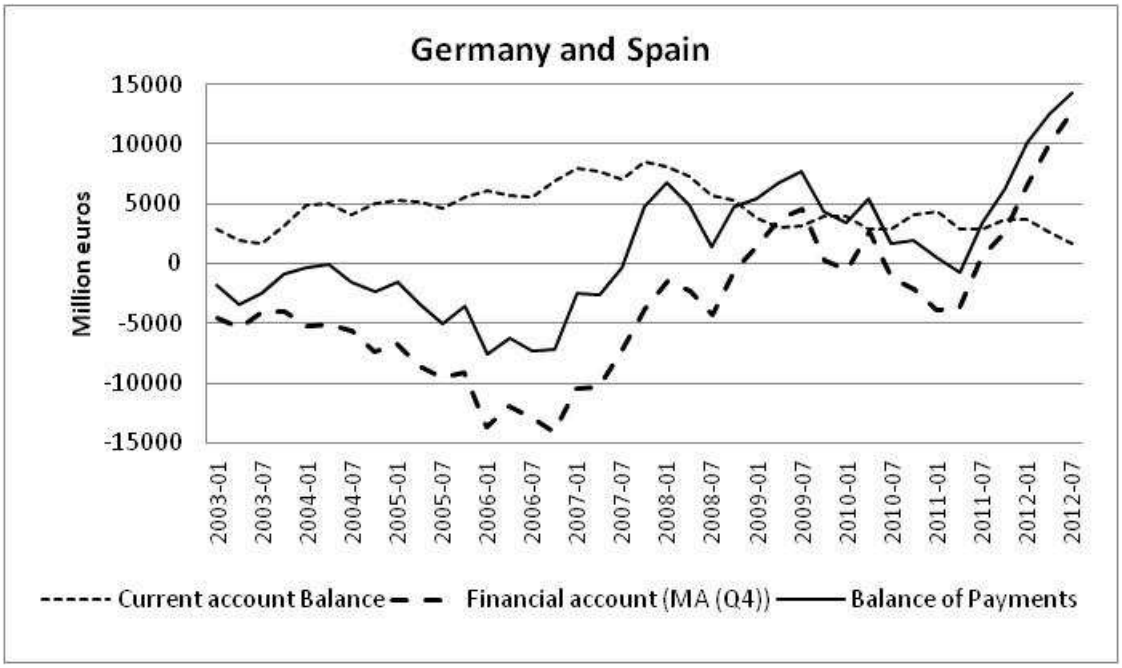
In this section, we provide an explanation of the working of the TARGET2 system (T2 onwards), acronym for **T**rans-European **A**utomated **R**eal-Time **G**ross Settlement **E**xpress **T**ransfer System, which is the system through which private banks in one country of the EZ settle cross-border debts to banks in another EZ country.[2]

We describe what T2 is by means of what it does. We shall assume two private banks in different countries within the EZ, say Spain and Germany (named SPB and GPB), their respective central banks (BdE and Buba), and the European Central Bank (ECB onwards), which manages the T2. We shall take into consideration the following movements, which roughly represent what has happened between Spain and Germany between 2003 and up to mid 2012. Firstly, a Spanish corporation asks for a credit to a Spanish private bank, to fund the purchase of a German manufactured good (thus, leading to a current account deficit in Spain and surplus in Germany); next, the German private bank, where the sale proceeds are deposited, decides to lend them to the Spanish private bank (a capital account deficit in Germany and surplus in Spain offsetting the current account imbalance). Lastly, the German bank decides not to roll over its loan to the Spanish bank, and instead it brings *its* money back to Germany before the credit granted by the Spanish bank to the Spanish corporation matures (a balance of payment imbalance).

The following figure represents the evolution of the current account balance, the financial account balance (total investment balance, the average for the last four quarters) and the balance of payments between Germany and Spain, during the period 2003-2012, from a German viewpoint. The reader will realize that there has been a shift from a German balance of payments deficit against Spain until mid 2007 towards a surplus since then, mostly driven by a reversal in the financial account. Simultaneously there has been a reduction of the trade surplus since 2007 and a shift from deficit towards surplus in the financial account balance.

[2] For further details, see Kokkola, 2010.

Figure 1: Balance of payments, current account balance and total investment balance between Germany and Spain.



Source: Bundesbank: Series BBK01.EC1815 and BBK01.ED0375 and authors' elaboration.

We shall assume the endogenous money view. Therefore, a bank creates a deposit when it grants a credit (Moore, 1998, Graziani, 2003). Compulsory reserves are required as in an overdraft system (see for instance Lavoie, 1992, chapter 4).
Our starting point is the following. We begin by taking into consideration the Spanish private and central banks. Their initial balances are those in the figure below.

Figure 2

Spanish Central Bank (BdE)			
50	MRO	Monetary Base (MB)	50
Spanish private bank (SPB)			
450	Credit	Deposits	500
100	Public Debt (B)	MRO	50
50	Reserves	Equity	50

The BdE, which is part of the Eurosystem (the decentralized system of central banks, comprising the ECB –European Central Bank– and the 17 national central banks of the countries using the euro as the official currency), requires the Spanish private bank to hold a reserve of, let us say for simplicity's sake, 10% of its collected deposits (actually, the reserve coefficient amounts to 1% of collected deposits). This reserve has to be made in central bank money and deposited within the BdE. Therefore, the BdE has to lend this reserve, and it usually does so through a main refinancing operation (MRO), using public debt as eligible collateral. The Spanish private bank creates deposits when it grants credit and also when it purchases public debt.[3]

[3] Therefore, we assume an overdraft system, and a post chartalist view. See for instance Lavoie, 2013.

2.1. Target2 imbalances arise when a private bank makes a cross-border payment to another bank in the EZ.

Let us assume that a Spanish transport corporation asks for a credit amounting to 80 monetary units (m.u. from now on) to SPB in order to fund the purchase of a German car, which has to be produced. In turn, the German car manufacturer has to ask for a credit to a German private bank to fund the assembling of the car (which, for simplicity's sake, requires only labour). In terms of bank balance sheets, we have:

Figure 3

Spanish Central Bank (BdE)				Deutsche Bundesank (Buba)			
50	MRO	Monetary Base (MB)	50				
8	New MRO	Additional MB	8	8	MRO	MB	8
SPB				German private bank (GPB)			
450 100 50	Credit Public Debt (B) Reserves (R)	Deposits MRO Equity	500 50 50				
80 8	New credit Additional R	Deposit New MRO	80 8	80 8	Credit R	Deposit MRO	80 8

Once the car is finished and ready to be shipped to Spain, the Spanish transport corporation orders its bank in Spain to make the payment to the German car maker. How is the payment made? SPB needs to transfer 80 m.u. of central bank money through the BdE to Germany. However, it only has 58 so that it has to borrow 22 more m.u., from the BdE.[4] The BdE lends this amount, provided SPB has enough collateral, otherwise the payment could not be made. When SPB has got all the central bank money it needs, it orders the BdE to make the transfer to the German private bank (GPB). The BdE debits SPB's reserve account and credits the Buba's account held in BdE by the corresponding amount (80 m.u.). Now, the BdE orders the Buba to transfer 80 m.u. to GPB. Buba does so, crediting GPB's reserve account, which leads to an excess reserve for GPB, owned by the car manufacturer. At this point, the German borrower can cancel its debt to GPB. Within these movements, the debts between private agents in Spain and Germany become debts between their respective central banks and banks within their jurisdictions; those debts between central banks have to be netted out at the end of the day, and the remaining liabilities are shifted to the T2, within the ECB. Therefore, at the end of the day, T2 imbalances are not bilateral but *vis-à-vis* the ECB.

The following figure encapsulates the final situation.

[4] As Graziani, 2003, p. 62, puts it: "payments among commercial banks have to be intermediated by a third agent, being usually a central bank".

Figure 4

ECB							
80	T2 Claim against BdE			T2 liability against Buba			80
Spanish Central Bank (BdE)				Deutsche Bundesank (Buba)			
50 8 22	MRO New MRO Loan to SPB	Liability against T2	80	8 80	MRO Claim against T2	MB Additional MB	8 80
SPB				German private bank (GPB)			
450 100 80	Credit Public Debt (B) New credit	Deposits MRO Equity New MRO **Liabilities against BdE**	500 50 50 8 **22**	 **80** 8	 **Excess R** R	 Deposit MRO	 80 8

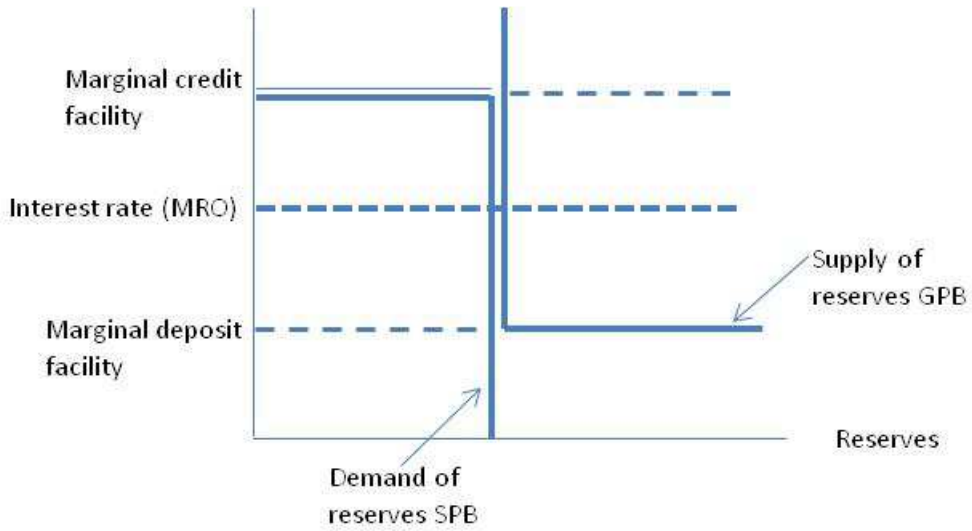
2.2. The Target2 imbalance caused by a current account deficit is offset by a capital account surplus. Implications for the control of the interest rate by the ECB.

Now, SPB does not comply with the level of compulsory reserves required by the ECB, whilst the GPB has an excess reserve. The debt between private banks, when cancelled, has become a debt of SPB to BdE, of BdE to ECB, of ECB to Buba, and of Buba to GPB.

The loan granted by BdE to SPB has to be settled (amounting to 22 m.u.) at the end of the day; also, the reserve requirement on deposits has to be fulfilled (50 m.u), and the 8 m.u. (new MRO) corresponding to the reserve for the deposit created as a consequence of the granting of the new credit, has to be paid back to BdE, because the corresponding deposit has been removed from the SPB's balance sheet. All liquidity requirements in terms of central bank money add up to 80 m.u. How can SPB pay back its debt and obtain the required reserves if it cannot create money for its own use? Under normal conditions SPB has to look for central bank money in the interbank money market. There, it will find the GPB offering its 80 m.u. excess reserves.

The following figure may help the reader (see Lavoie, 2005, p. 694):

Figure 5



The demand and supply of central bank money are very inelastic. In the figure above, we see that there are several interest rates at which demand matches supply. However, under *normal*

conditions, this market does not remain undetermined. On the one hand, SPB will not pay for reserves at more than the interest rate offered by the Eurosystem on the marginal credit facility; on the other hand, GPB will not lend its excess reserves at less than the interest rate offered by the Eurosystem on the marginal deposit facility. Usually, SPB and GPB reach an agreement at the middle point between both interest rates: the interest rate on main refinancing operations (MRO).[5] Then, GPB lends its excess reserves usually against a repo agreement on an eligible asset (public debt of the Spanish Treasury, or a mortgage backed security).[6] This loan is channeled through the T2 system, offsetting the previous imbalance between the two NCBs.

Within this financial architecture, the Eurosystem reaches two related goals. Firstly, the payment system runs smoothly: an agent in Spain can make a payment to another agent in Germany. And secondly, the Eurosystem controls the interest rate at which banks lend to each other.

In terms of balances, once GPB lends it excess reserves to SPB:

Figure 6

ECB							
0	T2 Claim against BdE			T2 liability against Buba			0
Spanish Central Bank (BdE)				Deutsche Bundesank (Buba)			
50	MRO	MB	50	8	MRO	MB	8
SPB				German private bank (GPB)			
450	Credit	Deposits	500				
100	Public Debt (B)	MRO	50				
80	New credit	Equity	50	8	R	Deposit	80
50	Reserve	Loan from GPB	80	80	Loan to SPG	MRO	8

Claims and liabilities against the T2 system cancel out as reserves are exchanged in the interbank market, so do debts and credits against central banks. And reserve accounts are replenished by SPB.

It should be noted, additionally, that these operations are quite similar if we consider two banks within the same country, with the obvious exception that there is one single central bank and no mention to the T2 system should be needed. This point is relevant because the working of a monetary union is rather similar to that of a single country.

2.3. A financial account imbalance leads to a Target2 imbalance. Repatriating German funds.

Now we consider what happens if GPB does not wish to roll over its loan to SPG once it matures. In this case, we are in a situation quite similar to that of Figure 4: SPB will have to borrow 30 m.u. from the BdE and then order it to transfer that money, plus its reserves held with BdE as reserves, to GPB;[7] BdE will order Buba again to credit GPB's account with Buba for

[5] According to current information provided by the ECB when this was written (March, 2013), the interest on the marginal credit facility is 1.5%, the interest on the marginal deposit facility is 0% and the interest rate on main refinancing operations is at 0.75%.

[6] As Lavoie, 2005, makes it clear, compulsory reserves are no longer needed by a central bank to conduct the interest rate.

[7] Bindseil and König, 2012, pp. 145 and ff. and footnote no. 17, inform that private banks intraday borrowing from the ECB is limited by the amount of eligible collateral which can be pledged. If banks exhaust their funding liquidity (the amount of deposit withdrawals that a bank can absorb before fire-selling its assets within a given time horizon), their corresponding national central bank may lend them through emergency liquidity assistance (ELA), though this is not an automated process (contrary to marginal lending facilities). And the debt which can be generated between national central banks within

such an amount; through this transfer BdE becomes temporarily indebted to Buba but, at the end of the day, debts between central banks are shifted to the ECB, so that BdE is indebted to the ECB and the ECB to the Bubba. GPB accumulates excess reserves amounting to 80 m.u. again.

Figure 7

ECB							
80	T2 claim against BdE			T2 liability against Buba			80
Spanish Central Bank (BdE)				Deutsche Bundesank (Buba)			
50 30	MRO Loan to SPB	Liability against T2	80	8 80	MRO Claim against T2	MB Additional MB	8 80
SPB				German private bank (GPB)			
450 100 80	Credit Public Debt (B) New credit	Deposits MRO Equity **Liabilities against BdE**	500 50 50 **30**	 **80** 8	 **Excess R** R	 Deposit MRO	 80 8

2.4. The ECB is forced to manage the efflux / reflux of liquidity in the interbank market, thus ensuring that the payment system runs smoothly. Otherwise, the monetary policy transmission mechanism does not work properly.

Finally, on the one hand, SPB has to cancel its very short term debt to BdE (30 m.u.) and fulfill the reserve requirements, and on the other hand, GPB has to decide what to do with its excess reserves.

Regarding SPB, it has at least two alternatives to obtain central bank money when the interbank market has collapsed. It can borrow from the BdE through the marginal lending facility (this happens at the initiative of SPB) or, alternatively, the BdE (we remind the reader that it is part of the Eurosystem), provides liquidity, on its own initiative, to SPB through an open market operation (a MRO or a long term refinancing operation, LTRO), or else through the outright purchase of an eligible asset (usually public debt). Since 2008, the Eurosystem has been providing liquidity to the market through MROs and LTROs (in full allotment) and, since May 2010, and to a lesser extent, through the Securities Market Program (SMP), which consists of outright purchases of an extended list of eligible collateral (which includes private debt as well). See ECB, 2011.

And with respect to the second question, about the use of excess reserves held by GPB, there is a potential problem for the ECB. If excess reserves are not removed from the GPB's balance, they can drive the interest rate from the MRO level to the marginal deposit facility level, since GPB will try to obtain a profit lending them at a slightly higher rate than the one at which ECB remunerates deposits. If a central bank cannot control the interest rate in the interbank market, the transmission mechanism of the monetary policy fails and it may become ineffective.

The GPB has at least three options to use its excess reserves: first, it can try to lend them, leading to a downward shift of the interest rate as commented above; second, it can redeposit them, directly, at the ECB; and third, it can cancel some pending debt, in this case with the Buba.[8] As Borio and Disyatat, 2009, or Lavoie, 2010 have pointed out, the ECB can keep control

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the Target2, as a consequence of a cross-border payment, has no limit and needs no collateral. See ECB, 2007.

[8] The latter option is a clear case of monetary reflux. See for instance, Lavoie, 1999.

on the interest rate in the interbank market just rising the interest on the deposit facility until it coincides with that of the MRO. German banks appear to have used a relevant amount of reserves to cancel debt with the Buba and also to fund the purchase of German public debt.
The following figure illustrates the fact that GPB cancels debt with the Buba:

Figure 8

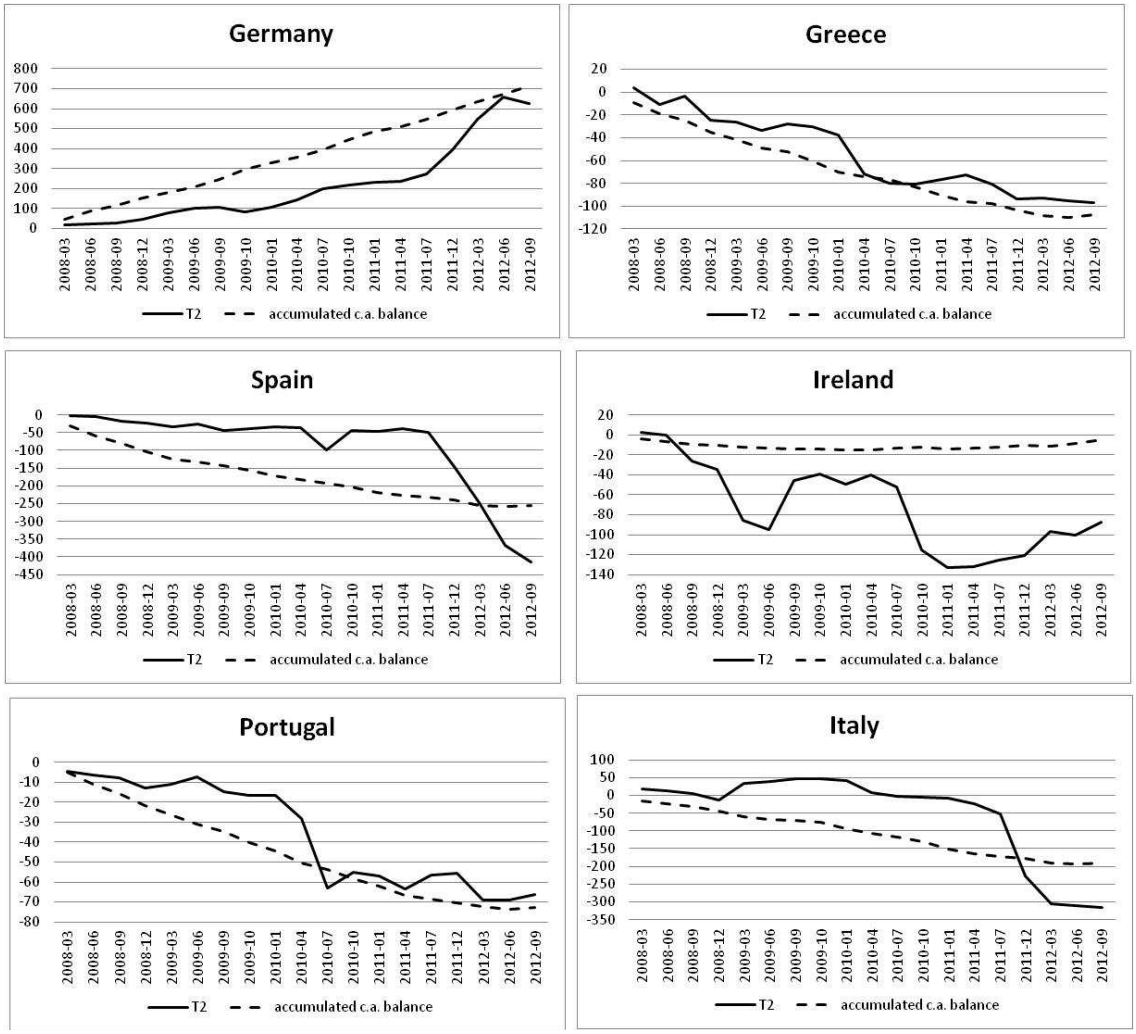
ECB							
80	T2 Liability against BdE			T2 liability against Buba			80
Spanish Central Bank (BdE)				Deutsche Bundesank (Buba)			
50 80	MRO LTRO	Liability against T2 Monetary Base	80 50	80	Claim against T2	Monetary Base Deposit of GPB	8 72
SPB				German private bank (GPB)			
450 100 80 50	Credit Public Debt (B) New credit Reserve	Deposits MRO Equity LTRO	500 50 50 80	72 8	Deposit in Buba Reserve	Deposit	80

The reader may wonder whether the Eurosystem can avoid lending to SPB. The obvious answer is that the Eurosystem has to lend overnight to SPB to make it possible the deposit transfer to GPB. Otherwise, the payment system collapses. Nevertheless, it could stop refinancing the SPB if the latter's assets fall short of liabilities plus equity in its balance sheet (e.g. the 'New credit' does not perform) and it fails to get the eligible collateral to be pledged. However, if a group of banks cannot get funds in the interbank market because the latter becomes fragmented and banks with excess reserves only lend to banks within their respective countries, the Eurosystem has to act as a market maker.
In essence, a T2 balance arises when a bank deposit is transferred from a bank in an EZ country to another bank in another different EZ country. T2 imbalances are the defensive consequence of the ECB's purpose of keeping under control the monetary policy transmission mechanism and the smooth working of the payment system. T2 claims and liabilities are not bilateral, i.e. against other national central banks, but against the ECB, which is owned by central banks of the EZ countries in percentages which are roughly proportional to the size of national economies. The size of T2 balances is, in principle, limited by the amount of collateral that private banks hold and can pledge to their corresponding central bank. However, in practice, this amount is almost unlimited if central banks enlarge sufficiently the list of eligible collateral. T2 liabilities have no maturity, but they require an interest payment. The reader may realize that if we consolidate both central banks balance sheets, plus that of the ECB, the description provide above is quite similar to that related to two banks within one single country. Finally, T2 imbalances may revert to *normal* levels if confidence returns to the interbank market. Confidence requires the ability of borrowers to pay back debts, and this, in turn, requires economic growth.

3. Some empirical evidence.

In this section, our aim is to discover what has caused TARGET2 imbalances. Firstly, we compare the evolution of T2 balances with accumulated national current account imbalances in Germany and GIIPS since 2008. Both variables begin at zero level in early 2008.

Figure 9: TARGET2 balances and accumulated current account balances since 2008.

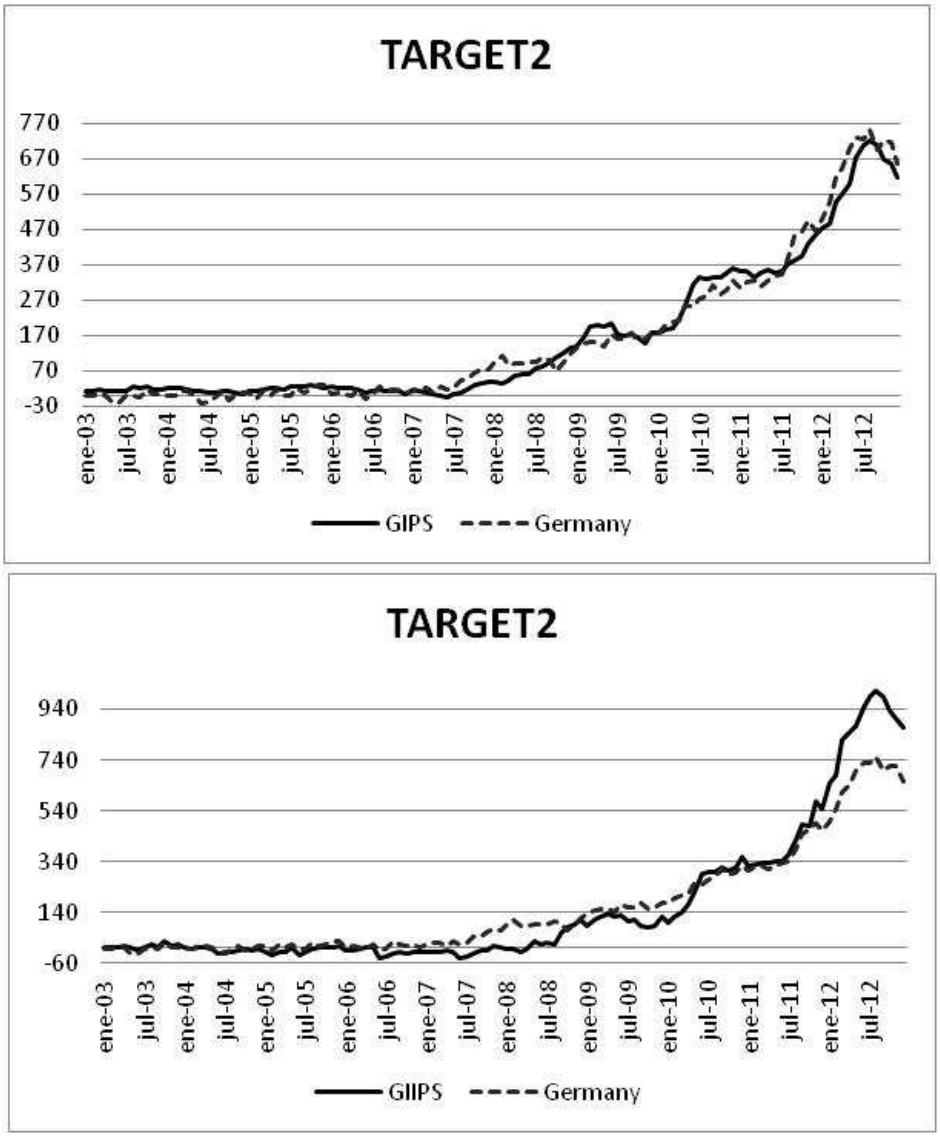


Source: NCBs, Eurostat and authors' calculations.

Correlation has being high between the accumulated current account balance and the T2 balance for Greece and Portugal since early 2008; it is much lower for Italy and Spain, and it is almost nil for Ireland. In the German case, correlation is relatively high. In Spain and Italy, negative TARGET2 balances have increased substantially since mid 2011. The opposite holds for Germany. Therefore, T2 imbalances are not funding current account deficits in Ireland, Italy or Spain.

There is a high degree of correlation between the TARGET2 balances of Germany and GIPS, however correlation is a little lower if we add Italy to the GIPS.

Figure 10: TARGET2 balances. Germany, GIPS and GIIPS.

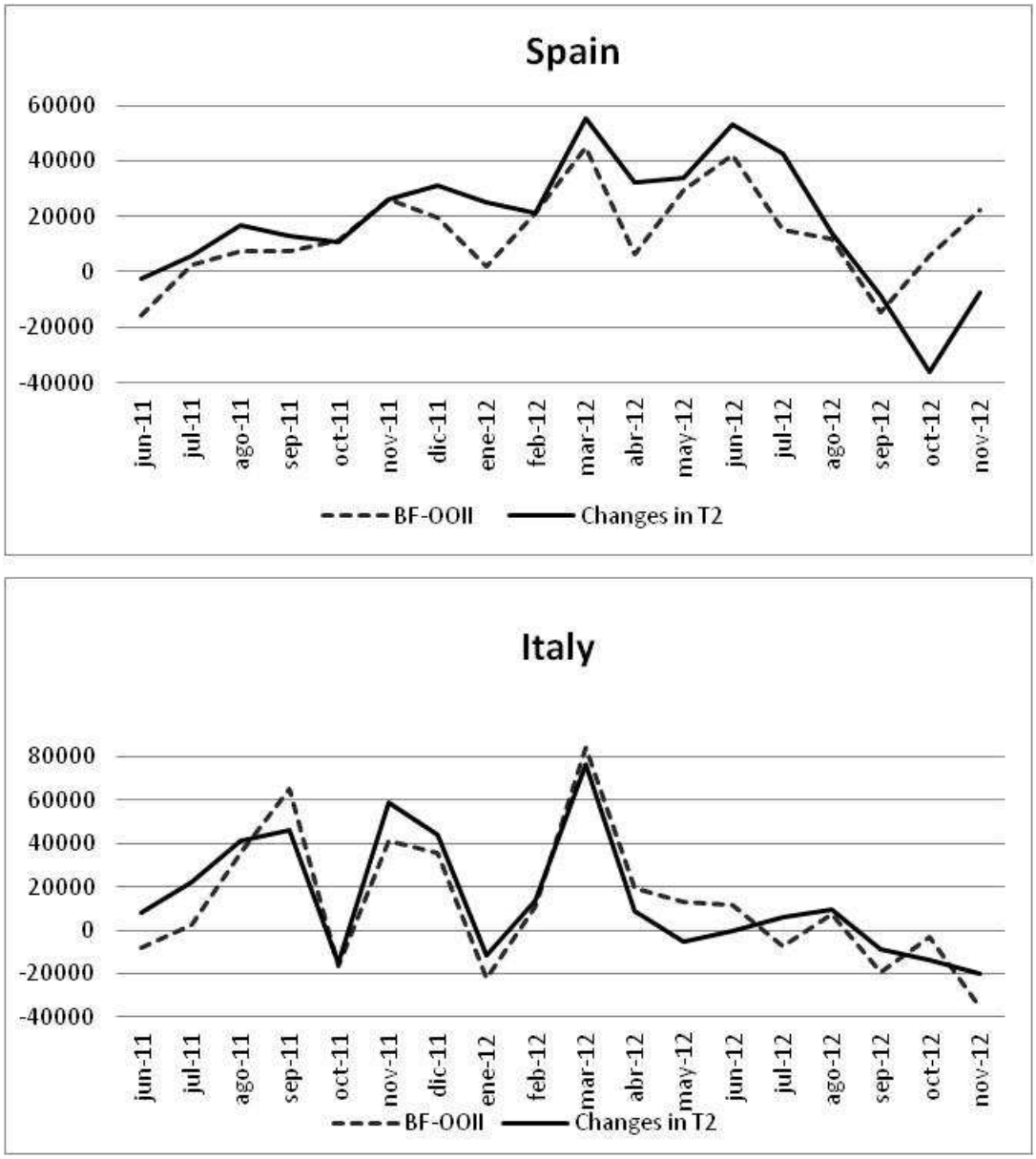


Source: NCBs and authors' calculations.
Note: The sign of TARGET2 balances for GIPS and GIIPS has been changed in order to make it easier for the reader to compare the evolution of both series.

TARGET2 balances begin to grow in mid 2007, though they rocketed sky high from June 2011, when financial capitals leave Italy and Spain *en masse*. Between mid 2008 and late 2010, capital flows from Greece, Ireland and Portugal (at the end of 2012, GIP's T2 liabilities represent 30% of GIIPS's T2 liabilities). In the following figures we can see the high correlation between the change in T2 balances and the 'other investment balance' included in financial account balance, mostly made up of bank loans, bank deposits and temporary operations for Spain and Italy. This leaves us to draw that it is the financial account and not the trade balance which drives T2 balances.

In short, GIIPS's T2 imbalances are mostly explained by financial account deficits which, until 2007 for GIP and until mid 2011 for Spain and Italy, had experience a surplus balance covering current account deficits in the past (but see Mody and Bornhorst, 2012, De Grauwe and Yi, 2012, and Borio and Disyatat, 2011).

Figure 11: Financial account and Changes in T2 balances. Spain and Italy.



Source: Banco de España, Banca d'Italia and authors' calculations.
Note: BF-OOII stands for the financial account balance, other investments. Positive values of BF-OOII mean a capital outflow. Positive values of Changes in T2 mean growing T2 liabilities.

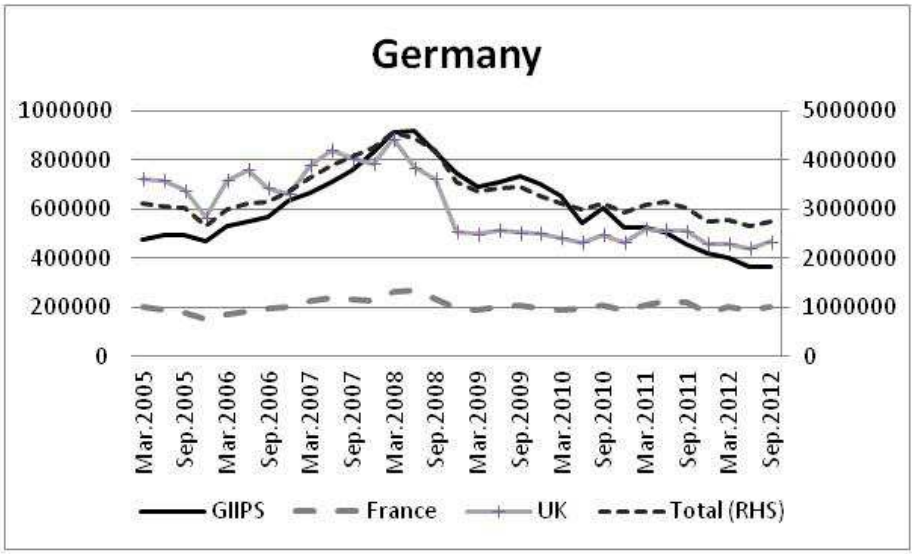
Lastly, we provide some evidence on the evolution of the cross-border exposure of banks in Germany, France and the UK to the periphery and to core EZ countries. In Germany and France, banks have reduced their exposure to banks in GIIPS and the UK since mid 2008, a little earlier than the fall of Lehman, and this drove total exposure down until the end of 2012. Exposure to GIIPS declines smoothly since mid 2008. German exposure to French and UK banks has been rather stable since early 2009.

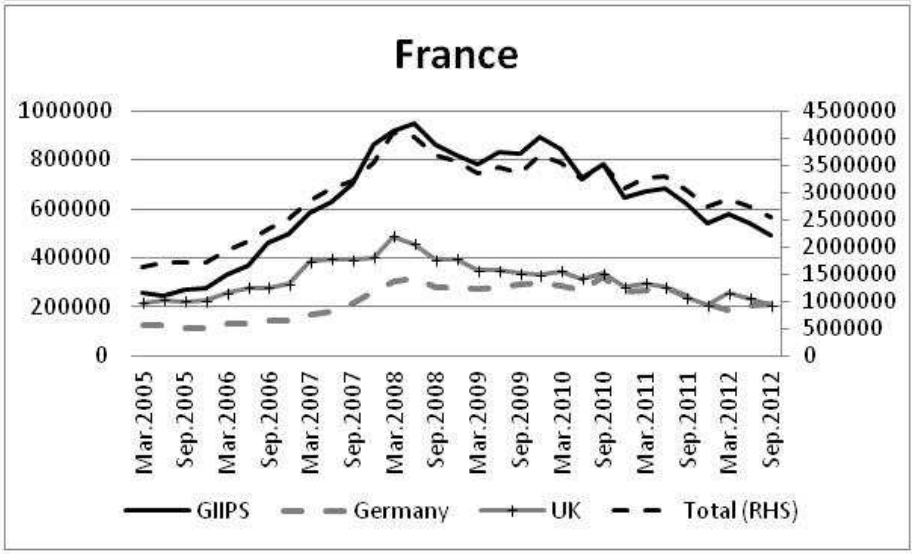
French banks began to reduce their exposure to banks in GIIPS and UK in the same period as German banks. French exposure to GIIPS has fallen more quickly since mid 2011 (when it reduced its exposure to Italy and Spain). Exposure to German banks increased in 2007, then remained rather stable until late 2010, and it has declined since early 2011.

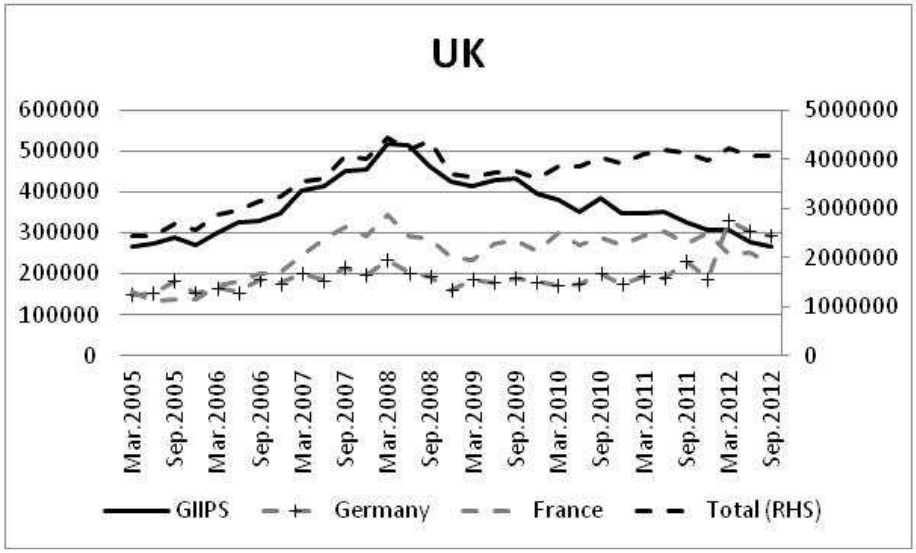
Finally, banks in the UK reduced their exposure to GIIPS though their total exposure first began to fall in late 2008 and then it increased. Exposure to France was stable between mid 2008

until 2011, and then it declined. This fall was offset by an increase to German banks (Cechetti et al. 2012).

Figure 12: Cross-border exposure of Banks (ultímate risk basis) in Germany, France and the UK (millions of US dollars).







Source: BIS and authors' calculations.

4. Interpreting T2 imbalances: a stealth bailout or a defensive response by the Eurosystem?

Once we have presented the mechanics of the Target2, we aim to provide an interpretation. Particularly, we discuss whether the accumulation of T2 liabilities against the Eurosystem mean a stealth bailout of the GIIPS countries by the ECB, at the expense of German savings, an argument championed by, e.g. Sinn and Wollmershäuer (S&W onwards), 2012, or rather, a defensive and automatic monetary policy response by the European monetary authority to the crisis in the EZ, a position defended amongst others by Bindseil and König, 2012, and to which we are sympathetic.

In this section, we provide a brief account of the stealth bail out argument; next we raise some criticisms to this view, grounded on the automatic response standpoint, and also to the presumed risk on Germany in case of a disorderly euro breakup.

4.1. *The ECB's stealth bail out view.*

Hans Werner Sinn, president of the very much influential Munich based Ifo Institute, has a great deal of responsibility for the wide interest on the evolution of the T2 imbalances. He has changed his view on some aspects of the T2, but in essence his argument is as follows (shorter versions are Sinn 2011a and 2011b).

After the launch of the euro, EZ peripheral countries run ever-larger current account deficits, leading to a piling up debt to the rest of the world (in 2009, the net international investment position of GIIPS reached between 90 and 100% GDP of GIPS). These deficits were funded, until the onset of the international financial crisis, by EZ core countries, which were experiencing surplus current account balances (i.e. S&W hold an international version of the loanable funds theory). Once investors lose their confidence on the ability of GIPS to pay back their debts, they stopped rolling over financing deficits and decided to repatriate their investment saving funds to safer harbors.[9] Consequently, GIPS' financial accounts went into the red at the same time as the interbank and other funding markets dried up. S&W view this situation as a typical balance of payments crisis in which GIPS should adopt painful measures (wage deflation and fiscal austerity, even leaving the euro) to be able to restore external equilibrium as a *conditio sine qua non* to collect the funds to pay back their debts to the EZ core countries. However, they could avoid adopting such measures, because the Eurosystem, through the corresponding national central banks (NCBs onwards), has provided them with the funds to pay back cross border debts.[10]

The cancelation of private debts between commercial banks has been transformed into debts between commercial banks and their respective NCBs and between NCBs within the EZ which, in the last instance, mean that core EZ savings are funding peripheral balance of payments deficits. Furthermore, this means a big risk for core EZ countries because, in case of a euro breakup, claims against the Eurosystem would become a capital loss, to be born by taxpayers in the core EZ.

The main arguments developed by S&W, 2012, can be summarized as follows.

[9] This decision was very much affected by the debacle of the American subprime morgages.

[10] Sinn, 2011b, initially held that T2 loans funded CAB deficits; this was criticized by several authors (Bindseil and König, 2012, Buiter, Rahbari and Michels, 2011, Whelan, 2013) on the basis of a lack of correlation between current account deficits and changes in T2 liabilities. Later, and due to these criticisms, S&W, 2012, shifted towards linking T2 to FAB imbalances (but see S&W, 2012, p. 12).

Figure 13: S&W's view of the working of the T2 system.

	Peripheral Central Bank		Core Central Bank	
Stage 1	10 Marketable assets 10 MRO	Reserves 20	50 Marketable assets 150 MRO	Reserves 200
Stage 2		Reserves -10 Target liabilities +10	+10 Target claims	Reserves +10
Stage 3	-10 Marketable assets	Target liabilities -10	+10 Marketable Assets -10 Target claims	
Stage 4	+10 MRO	Reserves +10	-10 MRO	Reserves -10
	Private bank in periphery		Private bank in core	
Stage 1	20 Reserves 80 Loans	MRO 10 Deposits 80 Due to private bank in core 10	200 Reserves 690 Loans 10 Due from peripheral bank	MRO 150 Deposits 750
Stage 2	-10 Reserves	Due to private bank in core -10	+10 Reserves -10 Due from peripheral bank	
Stage 3	- X Loans	Deposits -X	+X' Loans	Deposits +X'
Stage 4	+10 Reserves	MRO +10	-10 Reserves	MRO -10

We distinguish two countries, one in the peripheral EZ (e.g. Spain) and another one in the core EZ (e.g. Germany), two central banks and two private banks.

Four stages are considered. Firstly, the private bank in Spain is indebted to the private bank in Germany, because of an import in the past by the peripheral country which is compensated by a capital inflow from the core country. In this first stage, central banks in both countries have marketable assets (e.g. gold) and refinancing loans to banks on the asset side of their respective balance sheets, and reserves deposited by private banks as a liability, which stand for the monetary base. This stage represents the EZ before the unleashing of the financial turmoil at the end of 2007.

In the second stage, the private bank in Germany does not wish to roll over its loan to the bank in Spain. The cancellation of the debt between private banks requires central bank money. The peripheral central bank, BdE, reduces the reserve account of the private bank in its jurisdiction and increases its liabilities to the Target2 system. In turn, the core central bank, the Buba, increases its claims against the Target2 system and, simultaneously, increases the reserve account held by the private bank in Germany. Then, the German private bank gets rid of its claim on the Spanish counterpart whilst it increases its reserves at Buba. Up to this point,

things are formally the same as in the second section of this paper. It should be noted, however, that S&W state that the new reserves held by the German private bank are backed by an indirect claim on Spain which can be understood as German savings still being loaned to Spain, although indirectly: the debt between two private banks is transformed into a debt between the Spanish BdE and the ECB and between the latter and the Buba.[11] If Target liabilities are not paid, German tax payers, in the last instance, will have to recapitalize the Buba to cover the loss of that asset.

The third stage illustrates the solution proposed by S&W for the Target2 imbalances (see also Sinn 2011b, and Whelan, 2011): that Target2 liabilities should be paid back periodically with marketable assets. In a fixed exchange regime, a country experiencing a balance of payments crisis can keep its exchange rate constant whilst its central bank has international reserves to match capital withdrawals. Once these reserves are over, the economy is forced to adjust its external imbalance. This adjustment is assumed to take place in a textbook manner (see Bundesbank, 2012): the monetary base in the periphery shrinks when the central bank loses international reserves, leading to a fall in the money supply (this is the textbook logic of the exogenous money view) and to a rise in the interest rate.[12] This is described in the figure above with the fall of loans and deposits in an amount -X. The domestic aggregate demand is then depressed, making GDP to fall and unemployment to increase. As unemployment grows, money wages fall, restoring international competitiveness. Further, the rise of the interest rate would attract foreign financial capital. In this process, exports are expected to balance the fall in investment caused by the rise of the interest rate whilst, simultaneously, equilibrating the balance of payments. This adjustment process would be faster if the government in the country under stress balanced its budget for two reasons: firstly, the fall in wages would be faster, helping restore competitiveness sooner, and secondly, international investors would recover confidence in the sustainability of external debt faster.

In the core country, things happen the other way around. When the central bank receives marketable assets from the periphery, it stops granting credit to the peripheral central bank and then savings return to the core country. Newly created reserves are the consequence of the purchase of assets from the private bank. These reserves, according to the textbook money multiplier, lead to more loans and deposits in the core country, since now national savings remain within the nation's borders.

The fourth stage describes what has actually happened, replacing stage 3. On the one hand, the central bank in the periphery has lent newly created money through MRO to private banks, to replenish their reserve accounts held at the central bank, at low interest rates. According to

[11] S&W, 2012, p. 12 and ff., compare the evolution of the German economy and the evolution of TARGET2 balances since 2008 to the present with the German-US trade balance during the Vietnam war, before the bust of the Bretton-Woods system (p.13). At that time, the US printed new dollars to fund its current account deficit with Germany. These dollars flooded German banks with international liquidity which they transferred to the Buba in exchange for D-marks. In turn, the Buba recycled these dollars towards the US, investing in US Treasury bills, in order to keep constant the exchange rate between the D-mark and the US-dollar. Additionally, Germany tolerated this capital export as it was its contribution to help the US to finance the war. Therefore, Target2 claims against the Eurosystem currently held by the Buba are analogous to past claims on the US Treasury. In both cases, S&W claim, German savings fund excess spending abroad.

[12] New Consensus Macroeconomics (NCM) assumes that the variable under control for central banks control is no longer the money supply but the interest rate. In such a case, the adjustment takes place as follows. If the peripheral country losses all of its international reserves it has to look for funding in capital markets. These markets will force this borrowing country to pay a higher interest rate, reflecting risks. This interest rate (ruled by markets, not by the central bank) will push up the one that domestic agents have to pay when borrowing from banks within national borders. A higher interest rate means less borrowing, less investment and, therefore, less aggregate demand. Additionally, less borrowing leads to less bank deposits.

Sinn, this allows the troubled country to avoid the adoption of painful measures to correct its external position and to continue living beyond its means. On the other hand, private banks in the core use their excess reserves, which are the consequence of the Target2 claims acquired by their central bank, to cancel pending debts with their central bank or to make term deposits within it. The total monetary base for the whole monetary system remains stable, though refinancing loans grow in the periphery at the expense of a fall in the core. S&W, 2012, use the metaphor of a printing press, lent by the central bank of the core country to the central bank in the periphery, and the shredder machine. NCBs in the core countries created the central bank money and deposited it in reserve accounts of banks in their jurisdiction but, instead of lending it directly to them, they transferred it to NCBs in the periphery which, in its turn, refinanced credit granted by their respective banks. Banks in the core used central bank money to cancel debts with their central banks, leading to a destruction of that money.
S&W find at least three problems within this monetary circuit, where new money is created in peripheral central banks and destroyed in core central banks. Firstly, the central bank in the core country accumulates claims that are piling up against the Eurosystem. In the case of a disorderly euro breakup, this central bank will not be able to get its money back and then core tax payers will have to bear capital losses when they recapitalize their central bank. Secondly, outside euros (those created by peripheral central banks) crowd out inside euros (created by the core central bank). Private banks use excess reserves to cancel pending debts with their central banks in the core as they minimize the cost of holding unneeded reserves. If the circuit keeps going on, core private banks may end their indebtedness to their central banks. When this happens, central banks may lose the control they have to implement monetary policy. And thirdly, the balance of payments crisis within a fixed exchange regime will not be solved if the central banks provide stressed countries with required funds to avoid correcting measures.

4.2. *A critique*.
Although S&W, 2012, develop several arguments in their contribution, we shall focus our critique on two central points. Firstly, are Target2 imbalances the consequence of a voluntary, non-automatic monetary policy? Secondly, does Germany face a growing risk as it accumulates increasing Target2 claims against the Eurosystem?

4.2.1. *A stealth bail out or the logical consequence of monetary policy implementation?*
First of all, it should be noted that a monetary union is a political entity which falls somewhere in the middle of two extreme positions: on the one hand, a group of countries with a fixed exchange rate and, on the other hand, a single nation with its own currency and a national central bank. One difference between a monetary union and a single country is, amongst others, that there are several independent fiscal authorities; but, contrary to a pegged exchange rate system, a monetary union has a single monetary policy for all its members. This means, *inter alia*, that there is a single monetary authority which has to manage an interest rate which is the same for all members, to guarantee the smooth functioning of the settlement system, and to provide banks in all member countries the same access to central bank funding.[13]

[13] In the case of the EZ, the monetary policy is implemented by the Eurosystem, the decentralized system of central banks of the EZ, which comprises the ECB and the 17 NCBs of all countries using the euro as their official currency. The ECB is in charge, amongst other things, of fixing the level of interest rates for the whole EZ, operating the T2-ECB which is part of the T2 system, and monitoring and coordinating monetary operations, implemented by NCBs. In turn, NCBs execute monetary operations, operate the national component of the T2 system, issue banknotes in coordination with the ECB, and supervise and monitor banks within their national borders; they also collect statistics amongst other tasks.

Regarding monetary policy, whether in a single country or in a monetary union, as Bindseil, 2004, writes (p. 48): "the basic principle of monetary policy implementation can be stated: *influence through monetary policy instruments the demand and supply of reserves such that their price, namely, the overnight interbank interest rate, is close to the prevailing stance of monetary policy*" (italics in the original).
If we take into consideration an ideal central bank balance sheet:

Figure 14: Central bank balance sheet.

Autonomous factors	
(A) Foreign currency, incl. gold Investment assets Other assets	**(C)** Banknotes in circulation Government deposits Capital and reserves Other liabilities
Monetary policy operations	
(B) OMO I (e.g. reverse operations) OMO II (e.g. outright holdings of securities) Liquidity-injecting standing facility	**(D)** Liquidity-absorbing OMO I (e.g. reverse operations) Liquidity-absorbing OMO II (e.g. issuing debt certificates) Liquidity-absorbing standing facility
	(R) Reserves of banks (including those to fulfill required reserves)

Source: Bindseil, op.cit. p. 48.
Note: OMO = open market operations.

This table can represent the Eurosystem's balance sheet. In the case of a single NCB within the EZ, T2 claims against (e.g. the Bundesbank) or liabilities to (e.g the BdE) the Eurosystem, would be part of the autonomous factors (i.e. other assets or other liabilities. See below). The Eurosystem has no T2 imbalances because claims cancel out liabilities.
The demand for reserves is determined mainly by the level of required reserves (something decided by the ECB and which, when this was written, was 1% of collected deposits, and they are remunerated at the MRO rate) but also by excess reserves, which are willingly held mostly to attend payments minimizing transaction costs. When the reserve requirements are high and there is a deposit facility, excess reserves can be treated as an exogenous factor, proportional to required reserves. In formal terms, the demand for reserves R^D:

[1] $$R^D = RR + EE = r \cdot D + \epsilon \cdot D = (r + \epsilon) \cdot D$$

RR is required reserves, EE excess reserves, r is the percentage of deposits, D, which has to be kept in the form of reserves, and ϵ is the percentage of deposits which is held as excess reserves. The demand for reserves is highly inelastic with respect to the interest rate.
The supply of reserves, R^S, is given by the expression:

[2] $$R^S = [(A) - (C)] + [(B) - (D)]$$

Where (*A*) and (*C*) are autonomous factors, and (*B*) and (*D*) are monetary policy operations, on the asset and liability sides of the balance sheet shown above, respectively.
The supply of reserves can be viewed as the residual item which balances the balance sheet (Bindseil, *op.cit.* p.74).
In the short run, autonomous factors and the demand of reserves can be considered as exogenous for the Eurosystem. Hence, monetary policy implementation involves matching the

supply of reserves through monetary policy instruments to the demand of reserves in order to maintain their price close to a target level.

When a deposit is transferred from one country (e.g. Spain) to another one within the EZ (e.g. Germany), a Spanish private bank loses part of its reserves deposited at its NCB, as stated in section 2 above. Simultaneously, an autonomous factor in (*C*), Other liabilities –for T2 liabilities– will increase, restoring the equality between the asset and the liability sides of the NCB's balance sheet. Next, if $R - R^S$– falls, Spanish banks as a whole cannot fulfill the reserve requirement if the interbank market is fragmented and banks with excess reserves (in Germany) do not lend to Spanish banks. Consequently, the overnight interbank interest rate would differ greatly from the target interest rate, provided the elasticity of the demand for reserves is very low. Therefore, monetary policy instruments, netted in the asset side of the balance sheet, will have to increase. This means that open market operations (alternatively, standing facilities) are a passive and defensive instrument for the central bank if it aims at steering very short term interest rates, as post Keynesian authors hold (see for instance, Lavoie, 1992, chapter 4, especially quotations in p. 179). Under normal circumstances, the central bank will provide private banks with reserves to fulfill the reserve requirement. In the case of the Eurosystem, it usually lends against eligible collateral with a maturity of one week (MRO), or three months (LTRO); these loans are made at the initiative of the Eurosystem. Outright purchases, and longer term refinancing loans, have been implemented during the financial crisis (see Eser *et al*., 2012), though they can be considered as complimentary to the usual mechanism. By contrast, marginal lending facilities are conducted at the initiative of private banks, but they have been much less used in the EZ.[14]

Figure 15 illustrates the balance sheets of the Eurosystem, the Buba and the BdE, in March, 2011 and June 2012. We can see that the Buba increased its T2 claims by 403.6 billion euro, and this was accompanied by an increase in the deposit facility (DF) and absorbing fine-tuning operations (FTO, which also embodies term deposits), by 367.8 billion euro (and if we include Other autonomous factors, netted in the liability side, minus the fall of excess reserves, the increase amounts to 462.5 billion euro: 115% the increase of T2 claims). On the other hand, the BdE increased its T2 liabilities by 368.4 billion euro, and this was balanced by an increase of refinancing operations (MRO and LTRO) of 366.3 billion euro (the fall of reserves is balanced by an increase of banknotes issued). Further, the liquidity position of the German banking system, defined as the sum of autonomous factors, netted in the liability side of the Buba balance sheet, plus required reserves (Bindseil and Köning, 2012, p. 161 and ff.), is negative. This indicates that there is no need for liquidity provision by the Buba: quite the contrary, there is liquidity excess which has to be absorbed. The opposite holds for the Spanish banking system, which has a liquidity deficit so that the BdE has to provide liquidity to cover the gap.

[14] See Bindseil, *op.cit*. p. 156 for a discussion about the lack of clarity when considering reverse operations and standing facilities.

Figure 15: Balance sheets of the Eurosystem, the Deutsche Bundesbank and the Banco de España.

	March 2011			June 2012		
Assets	Eurosystem	Bundesbank	BdE	Eurosystem	Bundesbank	BdE
Autonomous liquidity factors (A)						
A.1. Gold and Claims in foreign currency	566.1	142.3	20.6	655.,2	175.8	38.5
A.2. Domestic assets	368.2	9.6	60.6	351.4	8.7	59.5
A.3. T2 claims		**353.6**			**757.2**	
Monetary policy instruments (B)						
B.1. CBPP + SMP	137.3	31.9	32.8	281.0	68.7	41.4
B.2. MRO	89.4	25.5	**8.1**	180.4	2.5	**49.9**
B.3. LTRO	342.9	46.2	**30.7**	1079.7	77.0	**355.2**
B.4. FTO	0	0.0	0.0	0.0	0.0	0.0
B.5. MLF	3.4	0.1	0.0	0.7	0.1	0.0
Total	1507.3	609.2	152.8	2548.438	1090	544.4
Liabilities						
Autonomous liquidity factors (C)						
C.1. Banknotes	822.2	205.2	90.0	893.7	222.5	97.6
C.2. Gov. Deposits	83	0.2	6.9	146.3	1.2	7.3
C.3. Capital and reserves	80.1	**5**	1.9	85.7	**5**	1.9
C.3. Other (net)	218.9	**278.9**	-9.1	322.7	**404.2**	-16.1
C.4. T2 liabilities			**40.0**			**408.4**
Monetary policy instruments (D)						
D.1. Absorbing FTOs	77.5	**38.9**	0.0	210.5	**160.9**	0.0
D.2. DF	19.4	**17.1**	1.2	772.9	**262.9**	32.0
Reserves (E)	206.3	63.9	21.9	116.7	33.3	13.3
Total	1507.4	609.2	152.8	2548.5	1090.0	544.4
F. Netted autonomous factors (liability side): (C) - (A)	269.9	-16.2	48.551	441.9	-308.8	401.1
Liquidity needs: Yes if F + E. > 0	Yes	Yes	Yes	Yes	**No**	Yes
Monetary Base: E + C.1.	1028.5	269.1	111.9	1010.4	255.8	110.9

Source: ECB, Bundesbank, Banco de España and Buiter *et al*. 2012.
Notes: CBPP: covered bonds purchase program, SMP: securities market program, MRO: main refinancing operations, LTRO: long term refinancing operations, FTO: fine-tuning operations, MLF: marginal lending facility; DF: deposit facility; Absorbing FTOs include fixed-term deposits.

Therefore, we conclude that T2 imbalances are the natural outcome of a massive transfer of deposits from the EZ periphery towards Germany; and *the refinancing loans (MRO and LTRO) to Spanish banks are not a separate, voluntary monetary policy of the ECB, but the logical*

consequence of aiming at keeping a uniform very short term interest rate for the whole EZ and running a smooth settlements system.

There is one additional question which we find relevant to the issue at stake. It has been raised by Sinn (2011b): what happens if the BdE has to cancel its T2 liabilities to the ECB with marketable assets, i.e. gold and claims denominated in foreign currency? This question has been dealt, correctly in our view, by Whelan, 2011: "Imagine it's September 2012 and I'm writing a cheque to a German economics journal to pay my submission fee. However, the cheque bounces. Even though I have sufficient money in my account, I'm told that Ireland [or whatever country with a T2 liability] has reached its limit on its Target2 balance [when marketable assets held by the respective NCB are over], so the ECB is refusing to transfer my money. In other words, the euros in my bank account can't do the same things that a euro in a German bank account can do. In other words, this kind of suspension of transfers would mean the end of the euro as a single currency". Under the requirement of paying back T2 liabilities with marketable assets, the EZ would move closer to a currency board where the monetary base is 'earmarked' to valuable assets denominated in a foreign currency. T2 could increase up to a certain limit posed by the amount of international reserves. This would impose a maximum to the amount of deposits that could be cross-border transferred to another bank. As, Whelan states, this would mean the end of the euro and the end of the EZ.

4.2.2. *Does the Eurosystem's refinancing of the EZ periphery mean increasing risk for Germany?*

Let us deal with this question with the help of the following figure.

Figure 16

Stage 1	Private bank Spain		Private bank Germany	
	100 Loan	Liability to German bank 100	100 Claim against Spanish bank	Deposit 100
Stage 2	BdE		Buba	
	100 MRO	T2 liability 100	100 T2 claim	Excess reserve 100
	Private bank Spain		Private bank Germany	
	100 Non-performing Loan	MRO 100	100 Excess reserve	Deposit 100

In the first stage, we have a private bank in Spain indebted to a private bank in Germany for whatever reason (see, for instance, the second section in this paper). Next, in the second stage, the German private bank does not wish to roll over its loan to the private bank in Spain so that it repatriates its investment. It does so through the T2 system, as explained above.

The relevant question now is what happens if the loan which the Spanish private bank had granted does not perform, and the collateral against the MRO is not enough to pay back its debt to the BdE?

It is quite clear that if the non performing loan granted by the Spanish private bank represents a small fraction of its assets, the loss can be covered with its capital. However, if non-performing loans make the asset side of its balance sheet fall below its liability side plus equity, the bank becomes insolvent.

In this second case, what are the risks for German agents? The private German bank has a claim (excess reserve) against the Buba, and the latter has a claim against the ECB, which is the operator of the T2 system. In turn, the ECB has a claim on the BdE and the latter has a claim on the private bank in Spain, which defaults.

As Jobst *et al.*, 2012, p. 89 explain, when a refinancing loan does not perform, the loss is distributed amongst the Eurosystem's NCBs as follows. The NCB which had granted the refinancing loan (BdE) removes the loan from the asset side of its balance sheet and reduces

the value of its capital account in proportion to its share in the Eurosystem (8%); next, the rest of the NCBs reduce the value of their capital according to their corresponding share and this amount is transferred to the former NCB through the T2 system. The following table illustrates this.[15]

Figure 17

	BdE		Buba	
Stage 3	100 MRO	T2 liability 100	100 T2 claim	Excess reserve 100
	↓ 100 ~~MRO~~	T2 liability ↓92 Capital ↓8	↓92 (27%) T2 claim	Capital ↓92 (27%)
	Private bank Spain		Private bank Germany	
	100 ~~Non-performing Loan~~	~~MRO~~ 100	100 Excess reserve	Deposit 100

In this situation, the Buba (and the rest of NCBs in the Eurosystem) would see its T2 claims reduced in proportion to its share in the Eurosystem (nearly 27%), whilst the T2 liabilities held by the BdE decline as well.[16] T2 claims are remunerated by the Eurosystem at the same rate as reserves. Under normal circumstances, interests on MRO go from the Spanish private bank to the BdE and the latter transfers them to the Eurosystem which, in turn, transfers them to the owners of T2 claims (the Buba). When the private bank (in Spain) goes bankrupt, obviously, it stops paying interest on refinancing loans. Does the bankruptcy of the Spanish bank mean a loss for Germany? S&W, 2012, (see also Sinn, 2012) hold this view, because the loss of interest earned on T2 claims means lower profits for the German Treasury, accruing to Germany through a declining primary income balance.

We find S&W's view partially correct, because Germany would lose part of its financial wealth (T2 claims are part of its net international investment position) and the corresponding interest on them,[17] channeled through the Eurosystem, but this view requires at least four considerations.

Firstly, it is rather ironic to complain about the risk caused by the increase of T2 claims held by the Buba when most of these claims are the direct consequence of a fall in the cross-border exposure of German banks to GIIPS (Dullien and Schieritz, 2012). The increase of T2 claims is just a change in the composition of the net international investment position: that is, German banks get rid of risky assets (loans to GIIPS banks) in exchange for non-risky assets (Buba's liabilities). T2 claims do not provide any support for Buba's liabilities (i.e. its reserve supply) because the euro is fiat money. A fraction of the increase of T2 claims by Buba is caused by a transfer of deposits owned by savers in GIIPS, due to the fear of a euro break up. However, this does not change the essence of the argument:[18] German banks obtain inexpensive reserves in exchange for T2 claims accumulated by the Buba, which do not affect to its ability to supply its own liability on demand.

Secondly, S&W recommend setting a cap on T2 imbalances, but the potential loss for Germany if GIIPS banks default is not caused by T2 imbalances, but by monetary policy implementation, particularly within refinancing loans to troubled banks in GIIPS. As stated above, when the

[15] Items in Spain's Private bank balance sheet are crossed out indicating that the bank has been dismantled when it goes to bankruptcy.

[16] It should be noted that countries with no T2 claims would incur capital losses as well, in proportion to their shares on the ownership of the ECB. These losses would be matched by increasing T2 liabilities.

[17] The authors acknowledge Sergio Cesaratto for clarifying this point.

[18] De Grauwe and Yi, 2012, argue that if most transferred deposits towards Germany are owned by residents in GIIPS, the potential loss in the last instance does not fall on Germany but on the owners of those deposits.

interbank collapses, the Eurosystem adopts the role of market maker, providing banks with all their much needed liquidity which they fail to obtain in the money and capital markets. This unlimited liquidity provision though collateralized loans has two objectives: banks can attend deposit withdrawals (mostly through the T2 system) and to help banks to continue granting credit at rates close to the official ones.[19] This monetary policy should have been addressed to illiquid banks, dismantling the insolvent ones. Nevertheless, had the Eurosystem denied the provision of liquidity to banks things would have been much worse in the whole EZ (see Bindseil and König, 2012; see also Garber, 2010).

Thirdly, the potential loss for Germany –the loss of interest on T2 claims, and the T2 claims themselves– is a consequence of the existence of one single –thought decentralized– central bank and several fiscal authorities. If there were a single economic authority (comprising one central bank and one single European treasury owning the former) backed by a political union, the single central bank could provide unlimited funds to the single fiscal authority (this view is backed by the Lernerian notion of functional finance, see for instance Lerner 1943 and contributions in Nell and Forstater, 2003). It is common knowledge that there are seventeen fiscal authorities, but the Eurosystem could provide unlimited liquidity to them as well. The problem, thus, would be one of democratic legitimacy: why should the Eurosystem fund the Spanish Treasury and not the German one? It should be noted that what NCBs within the Eurosystem transfer to governments as interests on T2 claims is central bank money, something which is under their control.

And fourthly, S&W fear that if the euro breaks up (or even core EZ countries with T2 surpluses leave the euro), a fraction of the national financial wealth of core EZ countries would vanish and this would be just as if the Buba destroyed its gold bullion reserves. They claim that the burden of recapitalization would fall on the German taxpayers.

We find Whelan's reply to this argument interesting. Without denying that T2 are part of Germany's financial wealth, Whelan, 2013, states that in the event of a disorderly euro dissolution, the true problem for Germany, which has followed an export led growth pattern for a long time, would be that its new Deutsche-mark would appreciate with respect to the already existing euro and, much more, the new currencies (e.g. the Italian lira, the Spanish peseta and so on). The Buba's capital loss could be compensated with a German Treasury loan, and in any case, Buba's liabilities (bank reserves) are not supported by Buba's assets (see also Buiter and Rahbari, 2012, regarding the curious notion of central bank capital).

The loss for Germany would be that it could not purchase goods and services in the rest of the EZ without borrowing. However, we do not believe that Germany should be concerned about this niggling question in the event of a euro break up as it is an export-led growth country. For T2 debtors (Spain in our example), things could be much worse. The Spanish economy might renege on its debts denominated in euro, or convert them into new pesetas, with the ensuing loss for creditors. But since the new currency will depreciate, reducing foreign creditors' private wealth, Spain would have to raise interest rates and implement fiscal austerity in order to get access to credit in international markets as well.

[19] Banks create deposits when they grant credits, as the endogenous money view holds. However, a bank will not make a loan even to a creditworthy borrower if the corresponding deposit is likely to be transferred to another bank, the interbank market has dried up and this bank does not have the liquid assets to fund the deposit withdrawal. The bank will change its view if the central bank provides all liquidity on demand, despite the interbank market having collapsed, even more si if there is some fiscal repression (or arm twisting, as Buiter and Rahbari, 2012, call it) by the national fiscal authority. In the Spanish case, loans granted by banks to resident agents fell by more than 5% between late 2009 and late 2012; yet, credit to government has increased almost 46% whilst credit to non financial corporations and households has fallen more than 9%.

5. Conclusion.

The EZ has been experiencing a deep crisis as a consequence of the accumulation of current account imbalances since the launch of the euro (Hein *et al*. 2011, Uxó *et al*. 2012). Between the late 1990s and 2007, current account deficits in the EZ periphery were matched with financial account surpluses in core EZ countries. However, the debacle of the American *subprime* mortgages, the burst of real estate bubbles in some deficit countries (Ireland and Spain), and some well-founded rumours about 'creative accounting' in Greece, amongst other factors, drove investors to a loss confidence on financial markets and to a massive repatriation of funds to safer harbors. This has fragmented the interbank money market, so that banks stop making cross-border loans to other banks.

In a pegged exchange regime, countries suffering a balance of payments crisis are enforced to adopt painful measures in order to restore their external balance: that is, they have to generate a trade balance surplus in order to obtain the international reserves to cover withdrawals in the financial account balance.

Conversely, in a monetary union which is characterized by a single monetary authority, the central bank has to provide deficit countries with the required liquidity to fund the massive capital outflows towards surplus countries. In a system of decentralized central banks, this provision of funds transforms debts between private banks into debts between private banks and their respective central banks, and between central banks of different countries and the ECB. The latter imbalances take place through the TARGET2 system.

Central banks in the periphery lend to banks within their jurisdiction against eligible collateral (usually sovereign public debt) to comply with the reserve requirement, and next this central bank money flows to the core, leading to an excess reserve there, which has been used to cancel bank debt within their central banks, and to purchase sovereign public debt of their national treasuries.

The Eurosystem had no choice but to lend to private banks in the periphery. Otherwise:

- The payment system would have collapsed, because deposits in the periphery could not have been used as means of payments to cancel debts.
- Private banks in the core EZ would have suffered amazing losses given their exposition to banks in the periphery.
- The transmission of monetary policy would have ceased to work: the lack of access to funding would have led banks in the periphery to pay skyrocketing rates for reserves in money and capital markets.
- All of the whole peripheral economies would have collapsed, dragged by the fall of their banking system. This would have meant the end of the euro.

Sinn and Wollmershäuer have mistakenly pressed several alarm buttons, because they have confused a pegged exchange rate system with a monetary union. In essence, they claim that T2 imbalances are loans granted by the Eurosystem (in the last instance, funded with German savings) which allow peripheral countries to avoid adopting hard measures to restore external equilibrium, and to continue living beyond their means. Moreover, in the last instance, these loans are a risky asset for Germany. Therefore, their economic policy recommendation is to set a cap on T2 imbalances, and to cancel them by handing over marketable assets. This should force peripheral countries to restore their external balance through a competitive devaluation (falling nominal wages) and fiscal austerity. Accordingly, some countries would find it easier to return to equilibrium leaving the euro.

There are two mistakes within this view:

- T2 imbalances are not *new* loans, but the defensive outcome of a central bank aiming at steering a payment system smoothly, and at granting access to all banks within the monetary union under equal conditions. Without refinancing loans, provided by NCBs, private banks in the EZ periphery could not comply with the reserve requirement.

- Fiscal austerity and wage deflation would do more harm than good even to Germany, an export-led growth country, because these deflationary measures would shrink its external markets even further. Moreover, austerity-cum-deflation will increase the fraction of non-performing loans in the periphery and, therefore, the likelihood of NCBs capital losses.

T2 claims are part of German financial wealth, so the German authors are right when they claim that there is a risk for Germany if there is a disorderly euro breakup. However, their economic policy recommendations are more of a self-fulfilling prophecy than a solution to this risk.

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