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Euro Area: Single Currency – National Money Creation

by Stefan Kooths and Björn van Roye

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The Eurosystem has been pursuing a crisis management policy for more than four years now. This policy aims primarily at maintaining financial stability in the euro area by providing vast liquidity support to commercial banks that are operating in nationally segmented banking systems. As a side effect, the national central banks substitute money market operations for cross-border capital flows. The national central banks are thus increasingly engaging in substantial balance-of-payments financing, and financial risks are being shifted from investors to European taxpayers via the Eurosystem. Symptomatically, this shows up in exploding TARGET2 positions in the national central banks' balance sheets. The longer this process continues, the stronger the centrifugal forces become that ultimately might break up the single currency. Instead of a fiscal union, a euro-area-wide regulatory approach is required. In addition to establishing a uniform scheme for banking regulation, supervision and resolution, we recommend that contingent convertible bonds (CoCos) be introduced to provide a major source of refinancing for the banking industry. Since CoCos cannot be introduced overnight, national and European banking resolution funds would be needed in the short run. These funds would not rescue banks but they would kick in as soon as a bank's equity is depleted in order to wind up failing banks in a systemically prudent way.

Keywords: Balance-of-payments financing, Target2, Eurosystem, Monetary policy, Financial crisis, Euro area, Financing mechanisms.

JEL classification: E42, E51, E58, F32, F34

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Euro Area: Single Currency – National Money Creation*

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Abstract

The Eurosystem has been pursuing a crisis management policy for more than four years now. This policy aims primarily at maintaining financial stability in the euro area by providing vast liquidity support to commercial banks that are operating in nationally segmented banking systems. As a side effect, the national central banks substitute money market operations for cross-border capital flows. The national central banks are thus increasingly engaging in substantial balance-of-payments financing, and financial risks are being shifted from investors to European taxpayers via the Eurosystem. Symptomatically, this shows up in exploding TARGET2 positions in the national central banks' balance sheets. The longer this process continues, the stronger the centrifugal forces become that ultimately might break up the single currency. Instead of a fiscal union, a euro-area-wide regulatory approach is required. In addition to establishing a uniform scheme for banking regulation, supervision and resolution, we recommend that contingent convertible bonds (CoCos) be introduced to provide a major source of refinancing for the banking industry. Since CoCos cannot be introduced overnight, national and European banking resolution funds would be needed in the short run. These funds would not rescue banks but they would kick in as soon as a bank's equity is depleted in order to wind up failing banks in a systemically prudent way.

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Contents

1 Introduction

Ever since, both the currency framework as well as monetary policy operations rank among the most sensitive areas of economic policy making. The reason is that the central bank monopoly can be abused for inappropriate targets without the broader public becoming immediately aware of it. Thus, it does not astonish that during centuries governments all over the world could not resist this temptation. Recurring currency crises and periods of high inflation were the consequences.

The crux of potentially abusing the central bank monopoly always boils down to draw on central bank money creation for financing transactions in goods and services and thus to manipulate capital market flows instead of restricting the central bank to provide a universal means of payment. This abuse can happen by intention, e.g. by forcing the central bank to print money in order to finance fiscal deficits. Therefore, a key lesson has been to appoint the management of the central bank to an independent body whose competencies are narrowed down to the provision of a stable means of payment while explicitly ruling out the monetization of public debt (e.g. Sargent (1982) and Goodfriend (2007)).

However, overstretched central bank competencies can also result unintentionally from a defective framework for the financial system. Such a case can currently be observed in the European Monetary Union (EMU). Central bank money is provided virtually without limits while country-specific terms apply in the money creation process. This leads to massive balance-of-payments financing via the central bank system. Symptomatically, this defect shows up in ever increasing Target2-positions of deficit and surplus countries that have triggered a controversial academic debate.[1]

From the Eurosystem's point of view this development must be tolerated for the sake of preserving financial stability within the currency union and to prevent a credit crunch in some parts of it. To this end, central bank liquidity provision has been extended to a full-allotment policy and the refinancing standards have been

[1] Sinn and Wollmershaeuser (2011), Bindseil and König (2012), Abad et al. (2011), Deutsche Bundesbank (2011) and European Central Bank (2011) and Buiter et al. (2011).

eased substantially. While doing so, the Eurosystem accepts to rescue even those banks that would have to exit the market under normal monetary circumstances.

We show the motivation of the Eurosystem's monetary authorities in more detail in section 2. In particular, we stress the factors that contribute to nationally segmented banking markets that prevail even 13 years after the common currency area had been established. This is followed by an exposition of the financing mechanisms within the EMU emphasizing the distinction between liquidity provision and financial intermediation of the financial sector (section 3). This flow-of-funds analysis explains the factors driving the balance-of-payments financing process via the Eurosystem and elucidates the economic characteristics of Target2-positions. In section 4 we discuss the explosive outcome of continuing the current approach of monetary policy without resolving the banking crises in some member countries. We also show that the window of opportunity to prevent a crash of the single currency is still open. Finally, we sketch the fundamental pillars of a future financial framework for the EMU that overcomes the present defects and briefly discuss how to bridge the transition period from today to this more robust monetary regime.

2 Monetary policy in crisis mode

The financial market turmoil in the aftermath of the subprime mortgage crisis in the United States was succeeded by a banking and sovereign debt crises in several member countries of the euro area. This prompted the Eurosystem to change its monetary strategy in autumn 2008. Unconventional monetary policy interventions have been mainly intended to prevent a systemic crisis in the financial system. In particular, monetary policy makers still assess the risk of contagion between systemically relevant financial institutions to be so high that a collapse of the payment system can not be excluded.

In the meanwhile, the change of the monetary strategy towards a stronger focus on financial stability has led to serious problems within the EMU. In the following, we trace how the Eurosystem has drifted into its current situation, which measures the Eurosystem as a whole and the national central banks (NCBs)

have taken so far and to what extent these measures have amplified asymmetric central bank money creation in the euro area.

2.1 Confidence crises and dysfunctional interbank markets

In a fractional reserve banking system, the interbank market's function is to distribute central bank liquidity among commercial banks. Since commercial banks are exposed to permanent liquidity inflows and outflows that can not be compensated through the regulatory reserve deposits they rely on clearing liquidity balances via the interbank market. In normal times, the central bank must decide only on the total amount of money supply, and interbank market transactions distribute the amount among the commercial banks. However, when confidence between commercial banks erodes and interbank relations collapse – as it has been the case since 2007 – operational problems for monetary authorities arise (Giannone et al. (2012)).

A confidence crisis on the interbank market typically leads to liquidity shortages of certain commercial banks. In particular, it can not be precluded that also solvent banks are temporarily cut off from the interbank market. If the central bank opens its liquidity floodgates in such a situation, it involuntarily interferes with the market-based selection process. As the diagnosis of a general confidence crisis per se gives access to central bank liquidity support to all commercial banks even insolvent banks are bailed out.[2]

In normal times, heterogeneous financial regulation schemes do not induce conflicts between the central bank and the supervisory authority since responsibilities are clearly separated. In times of crises however, the tasks of central banks and banking supervision move closer together, because banking problems are directly linked to monetary and financial stability as well as liquidity management and the payment system's integrity (Schoenmaker and Goodhart 2012). With the breakout of the banking crises in the euro area, this coalescence of liquidity pro-

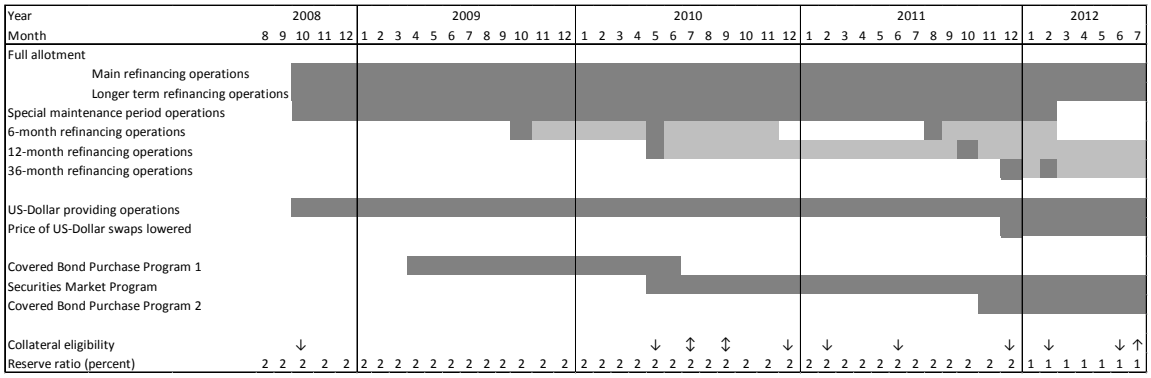
[2]Thornton (1802) and Bagehot (1873) were the first to identify and elaborate on the reliable distinction between temporarily insolvent and illiquid banks as a fundamental issue for central banking.

vision and financial regulation has materialized. Since supervisory authorities do not have a clear cut strategy and lack guidelines for systemic risk, the Eurosystem took over the quasi-fiscal task of maintaining financial stability.

2.2 Unconventional monetary policy and risk management

The Eurosystem has been following a monetary strategy that is characterized by several unconventional measures for the past four years (figure 1). The allotment procedure for main refinancing operations has been changed from an American tender procedure to a fixed tender procedure with full allotment. Alongside, several longer-term refinancing operations were implemented allowing commercial banks to borrow liquidity with a maturity of up to three years. Time and again, the Eurosystem eased its collateral eligibility criteria substantially. These measures have been intended to meet the increasing liquidity needs of certain commercial banks. Hereby, the Eurosystem has progressively replaced liquidity allocation, the task that is usually taken care of by the interbank market.

Figure 1: Unconventional measures of the Eurosystem 2008-2012



Notes: The dark grey bars indicate that operations were conducted, or committed to be conducted, in the specific month, while the light grey bars indicate that effects of past operations were in place. Upward arrows in the row collateral eligibility indicate an increase in collateral availability.

Source: ECB(2012).

Normally, the Eurosystem supplies central bank money only against adequate collateral. Collateral is adequate if the unilateral credit rating standards are in

line with the Eurosystem Credit Assessment Framework. This framework applies for two reasons: Firstly, the Eurosystem intends to guarantee that solid banks with a high-rated asset portfolio are not discriminated against non-solid banks with a low-rated asset portfolio. This is to safeguard efficient risk allocation in the banking system. A well-balanced and rule-based collateral requirement scheme is a prerequisite for minimizing moral-hazard and adverse selection in the banking sector that can arise under limited liability and information asymmetry (Kirabaeva (2011)). Secondly, the Eurosystem protects itself against default risks. Therefore, it accepts collateral with a minor credit rating with a margin call. A value of the collateral decreasing below a given threshold triggers the obligation for the borrower to post extra securities.

2.3 Country-specific unconventional measures

Beside the unconventional measures on the euro area-wide level the current monetary strategy enables the NCBs to use additional instruments for money creation on the national level.

(1) NCBs can provide liquidity to commercial banks via an emergency lending assistance (ELA) that is conducted beyond the standard refinancing operations. ELA collateral eligibility criteria are directly determined by the NCBs (European Central Bank (1999)). The possibility of lending through ELA empowers each NCB to act as Lender of Last Resort (LoLR). ELA was designed to provide sufficient liquidity to banks in times of extraordinary crises and should be used only as temporarily to keep the risk of moral hazard low.

(2) In February 2012, the ECB authorized some NCBs to set their own collateral eligibility criteria. Since then, credit claims to small and medium enterprises are selectively eligible for refinancing operations (European Central Bank (2012)). These new guidelines enabled commercial banks that depend on the liquidity provision by their NCB to transfer more collateral for obtaining higher amounts of central bank money. In particular, within the longer-term refinancing operations with a maturity of 36 months, central bank money creation significantly surpassed the level observed under standard eligibility criteria.

(3) Finally, the current monetary strategy allows commercial banks in some countries to directly use their own-issued securities as collateral for refinancing operations with their NCB. Under normal circumstances, those securities are not eligible for central bank operations. However, under the new regime they are accepted as long as they are guaranteed by the national government (European Central Bank (2008)).

2.4 National segmentation of the European monetary union

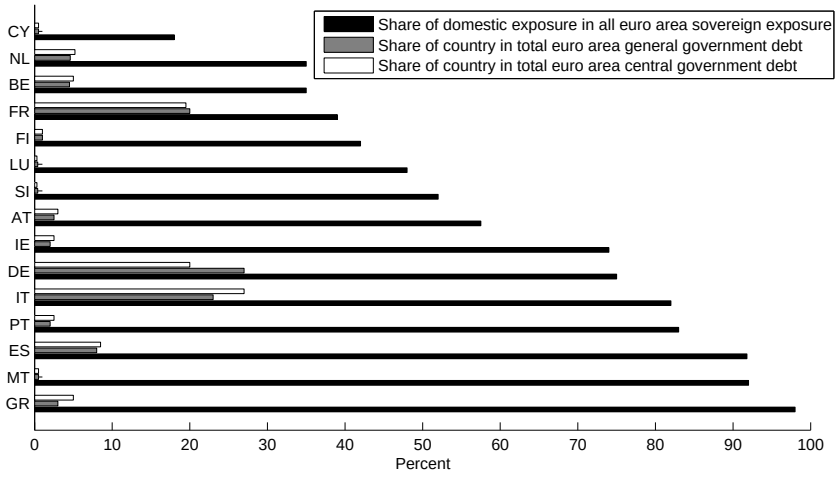
Despite the common currency area the scope of commercial banking has remained rather limited to the national levels, in particular in retail banking (Allen et al. (2011)). Cross-border banking usually comes along through cross-border mergers and acquisitions or the establishment of foreign bank branches. However, in the EMU several legal and regulatory barriers as well as procuring information in foreign markets hinder commercial banks to broaden their business activity to a EMU-wide level (Focarelli and Pozzolo (2001), Buch (2003)). This deficiency hints at an incomplete design of the EMU's financial framework that potentially exacerbates turbulences in times of crises. We identify four major factors:

(1) Although financial integration has deepened in the EMU over the past decade (Lane (2008), Schmitz and von Hagen (2009)) the increasing share of national government bonds in banks' balance sheets during the sovereign debt crises has led to a national re-segmentation of banking markets. In total, the share of national assets in commercial banks' balance sheets amounts up to 98 percent (Figure 2). The fact that banking crises can lead to sovereign debt crises (e.g. Ireland, Spain) and vice versa (e.g. Greece, Portugal) demonstrate the mutual dependency of the banking sector and the government sector. As a result, the country-specific sovereign debt crises reinforce the national segmentation of the euro area's financial system.

(2) However, even without the home bias in the banks' asset portfolios country specific risk profiles for systemically relevant banks can emerge due to the different fiscal powers of the national governments that are implicitly guaranteeing for their countries' banks. For this reason alone, there is no level playing field in the banking industry but different standings of commercial banks prevail from the

investors' point of view ("Banks are international in life and national in death", Goodhart (2009)).

Figure 2: Share of own government bonds in EA government bonds held by banks in 2010



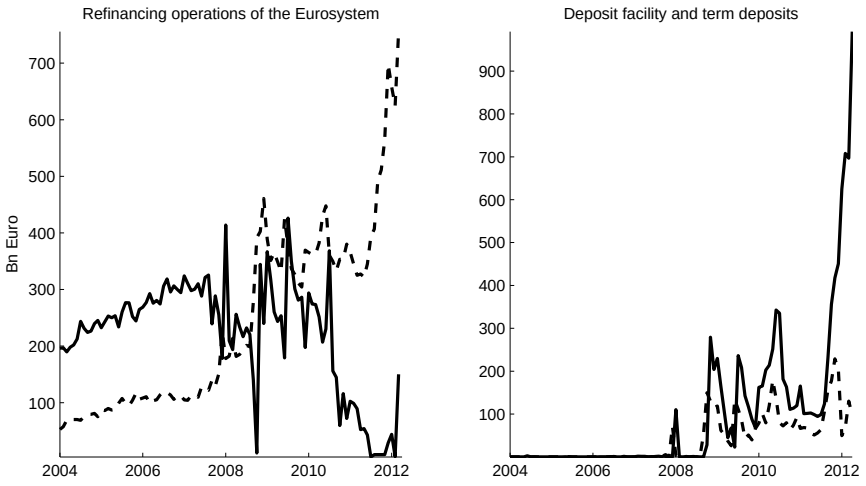
Source: EBA(2012), own calculations.

(3) Regulation of the commercial banking sector is still subject to national authorities in the euro area. This segmented regulatory framework has been identified as a potential risk for economic stability in times of crises already at the beginning of the EMU (Padoa-Schioppa (1999)). Despite the establishment of the European Banking Authority and the European Systemic Risk Board in 2010 a truly European banking regulation and supervision institution as well as binding rules for resolving failing systemically relevant banks have not yet been developed. Cross-border bank resolution is still a multilateral and not a supranational domain.

(4) Limited cross-border information in banking markets and differences in corporate identities, culture and geographical distance still remain considerable barriers for cross-border mergers and acquisitions in the EMU (Buch (2005)). In particular, lower transparency with respect to credit worthiness of foreign firms and households imply information asymmetry between local and foreign banks (Morgan (2002) and Flannery et al. (2004)).

As a consequence, the segmentation of the banking business along country borders is reflected in a similar segmentation of the interbank market. Commercial banks that are cut off from the European interbank market therefore primarily use refinancing facilities with their NCB. This is only possible, because the Eurosystem has loosened its collateral eligibility criteria over the past years and has switched to a full allotment policy. Hence, the monetary strategy combined with banking crises in some member countries has asymmetric consequences for the provision of central bank money. In May 2012, the liquidity providing operations of the NCBs of Greece, Italy, Ireland, Portugal, Spain, Belgium and France (GIIPSBF) mounted up to 800 bn Euro or 90 percent of total central bank money in the euro area. On the flip side, central bank money demand in Germany, the Netherlands, Luxembourg, and Finland (GNLF) declined sharply (Figure 3a) while the liquidity absorbing operations show the opposite pattern: the deposit facility and term deposits are primarily used by GNLF-based commercial banks (Figure 3b). They no longer depend on liquidity providing operations with their NCBs because inflowing central bank money created in the GIIPSBF-countries by far exceed their liquidity needs.

Figure 3: Liquidity operations of the Eurosystem 2004-2012



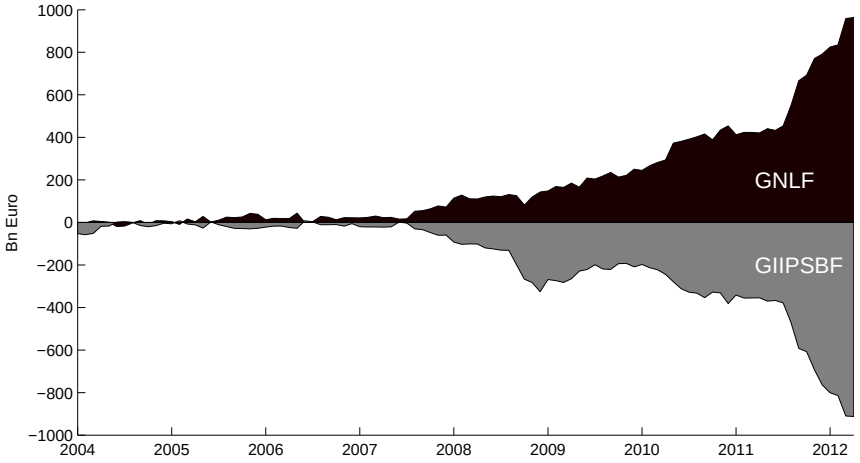
Notes: GNLF: Germany, the Netherlands, Luxembourg, Finland; GIIPSBF: Greece, Ireland, Italy, Portugal, Spain, Belgium, France.

Source: National Central Banks, own calculations.

Net central bank money flows from one member country to another reflect

balance-of-payment (BoP) imbalances that are financed via the Eurosystem. Countries with a BoP-deficit (GIIPSBF) show net outflows of central bank liquidity that are recorded as Target2-liabilities of their NCBs vis-à-vis the ECB. The opposite holds true for the surplus countries (GNLF). Target2 was initially designed as a clearing system for financial cross-border transactions that would typically be small and oscillate over time. However, the ongoing BoP-imbalances have led to exploding unidirectional Target2-positions (Figure 4).

Figure 4: Target2-positions



Notes: GNLF: Germany, the Netherlands, Luxembourg, Finland; GIIPSBF: Greece, Ireland, Italy, Portugal, Spain, Belgium, France.

Source: Osnabrueck University, own calculations.

3 Financing mechanisms within the EMU and Target2-positions

In this section we show the cross-border financing mechanisms within the EMU and their links to country-specific credit creation. This serves as a general framework for the analysis and interpretation of Target2-positions. Starting from the case of a workable currency union where only minor BoP-imbalances occur and clear over time we identify three different channels that cause considerable BoP-imbalances that symptomatically show up as unidirectional and persistent Target2-positions. While two of them (current account and capital flight financing) must be considered economically problematic the third channel (deposit flight) is ambiguous.

3.1 Framework: Financial markets and sectoral flows-of-funds

Economic transactions along the production, income, and expenditure processes in a diversified economy typically lead to financing balances of market participants that are cleared through capital flows. Via the capital market, parts of the production outcome are temporarily transferred from one market participant (creditor) to another (borrower). Simultaneously, claims and liabilities are created.

We use a two-country framework for our analysis. The domestic economy (country X) and the foreign economy (country Y) together form the EMU. We distinguish between four institutional sectors of a country's real economy: private households (supply of production factors, consumption), firms (production, investment), government (public expenditures, income redistribution), and the rest of the world (RoW)[3].

In their role as borrowers, sectors with a financing deficit are given access to a larger part of a period's production outcome than they could claim according to their contribution to value added net of public redistribution of income

[3]Transactions with countries outside the euro area are not relevant here and remain unconsidered. Therefore, within this framework, the rest of the world equals the rest of the euro area.

and wealth. According to this demand for capital they issue securities B that are acquired by sectors with a financing surplus (supply of capital). Securities are all sorts of documents that promise, future payments (shares, bonds, credit claims, etc.). To fulfill this promise either a future reverse product transaction is necessary or non-financial assets must be relinquished.

Without loss of generality, let's assume that investment and saving decisions are taken separately. Private households save and completely offer their savings S at the capital market (supply of capital). Firms with net investments I face a financing deficit and issue securities accordingly (demand for capital). The government and the RoW also participate in the capital market to finance their budget deficit BD and the current account balance CA respectively. The capital market flows and their corresponding transactions on the securities market can be summarized in the following equation:

$$\begin{aligned} \text{supply of capital} &= \text{demand for capital} \\ S_t &= I_t + BD_t + CA_t \\ \text{demand for securities} &= \text{supply of securities} \end{aligned} \tag{1}$$

Adding revolving stocks from the past (cumulated capital flows from all previous periods) expands equation (1) to:

$$\sum_{i=1}^{\infty} S_{t-i} + S_t = \sum_{i=1}^{\infty} I_{t-i} + I_t + \sum_{i=1}^{\infty} BD_{t-i} + BD_t + \sum_{i=1}^{\infty} CA_{t-i} + CA_t \tag{2}$$

Beside the capital market segment, in which the real sectors are trading, transactions for liquidity provision (money market segment) are also part of the securities market. In the money market, the demand for securities of the financial sector (central bank and commercial banks) reflects money supply M while the supply of securities of the non-financial sector (all real sectors) corresponds to money demand L. Economically, money market transactions are swaps of low-liquid assets into a fully liquid medium of payment. In contrast to the capital market, these transactions do not change the net financial position of market par-

ticipants. By including the money market segment the securities market equation further extends to:

$$\sum_{i=1}^{\infty} S_{t-i} + S_t + M_t = \sum_{i=1}^{\infty} I_{t-i} + I_t + \sum_{i=1}^{\infty} BD_{t-i} + BD_t + \sum_{i=1}^{\infty} CA_{t-i} + CA_t + L_t \quad (3)$$

When considering a point in time flows disappear and only the sectoral financial positions remain as stocks:

$$\sum_{i=1}^{\infty} S_{t-i} + M_t = \sum_{i=1}^{\infty} I_{t-i} + \sum_{i=1}^{\infty} BD_{t-i} + \sum_{i=1}^{\infty} CA_{t-i} + L_t \quad (4)$$

For further analysis we use an accounting system to show the flows-of-funds behind the financing mechanisms in the EMU (Table 1). Securities with positive values on the asset side of the balance sheets represent claims and liabilities otherwise. The stock of domestic and foreign securities (BX and BY) as well as their money holdings (Cash and Sight Deposits SD) constitute the households' financial wealth (FW). Securities issued by firms securitize mainly their tangible assets (TA). Additionally, firms have sold securities at the amount of their money holdings. Regarding the government sector, the sum of all issued government bonds equals government debt (negative financial wealth of the public sector). Finally, securities issued by the foreign sector represent the net foreign investment position of the domestic country. From the foreign sector's perspective, this position represents negative financial wealth, provided that the foreign country on average has run current account deficits in the past. Non-financial sector's money holdings match the securities held by the financial sector. Within the financial sector, commercial banks have passed through a part of their acquired securities to the central bank to fulfill the cash demand of the real sectors and to hold central bank deposits (in particular to fulfill the minimum reserve requirements). To begin with, let's assume that the financial sector uses only domestic securities in money market operations.

Table 1: Financial positions by sector

COUNTRY X: REAL SECTORS (NON-FINANCIAL SECTOR)

Private Households			
BX	550	FW	800
BY	150		
Cash	20		
SD	80		

Firms			
TA	400	BX	600
Cash	40		
SD	160		

Government			
BX	-250	FW	-250

RoW			
BY	-150	FW	-150

COUNTRY X: FINANCIAL SECTOR

Central Bank			
BX	72	Cash	180
Target2	0	CBD	20

Commercial banks			
BX	228	SD	240
CBD	12		

Consolidated			
BX	300	Cash	180
Target2		SD	20

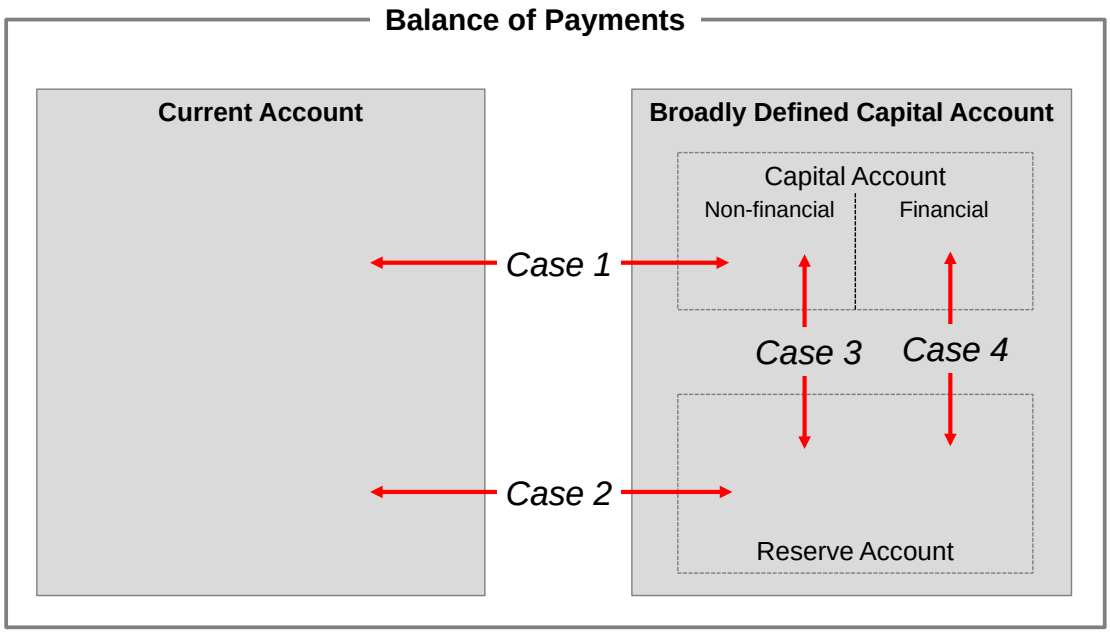
ECB		
	Target2X	0
	Target2Y	0

CBD: Central bank deposits, SD: Sight deposits, FW: Financial wealth, TA: Tangible assets, B: Securities, BX: Domestic securities, BY: Foreign securities

In the EMU, the monetary strategy is set by the ECB's governing council. However, central bank money is operationally provided by the NCBs. From an accounting perspective, the ECB reduces to a clearing house for cross-border payments. Remaining balances are recorded in the NCBs' balance sheets as changes in their net position with the Eurosystem ("Intra-Eurosystem claims/liabilities"). While cashless transactions affect the "Claims/liabilities on/towards the Eurosystem related to Target2", transactions in cash are recorded as "Claims/liabilities

related to other operational requirements within the Eurosystem". From a BoP-perspective, changes in the net position with the Eurosystem correspond to a member country's reserve account with respect to the rest of the EMU. If the EMU was a fixed exchange rate regime, positive (negative) Target2-balances and net cash inflows (net cash outflows) would reflect inflows (outflows) of currency reserves, i.e. a reserve account deficit (reserve account surplus).

Figure 5: Transaction cases in the BoP-framework



The financial positions of all sectors serve as a starting point for flow-of-funds analyses that allows us to distinguish between four different cases with respect to cross-border transactions and their impact on the balance-of-payments (Figure 5). Case 1 is the reference scenario for a workable currency union where money market and capital market transactions are clearly separated from each other. In contrast, in case 2 current account imbalances are no longer financed via cross-border capital flows but via the Eurosystem such that money market operations interfere in the capital market. Continuing from case 2, we show the BoP-effects of capital flight among EMU member countries (case 3). The cases 2 and 3 imply BoP-financing via the central bank system. Finally, case 4 covers the transactions

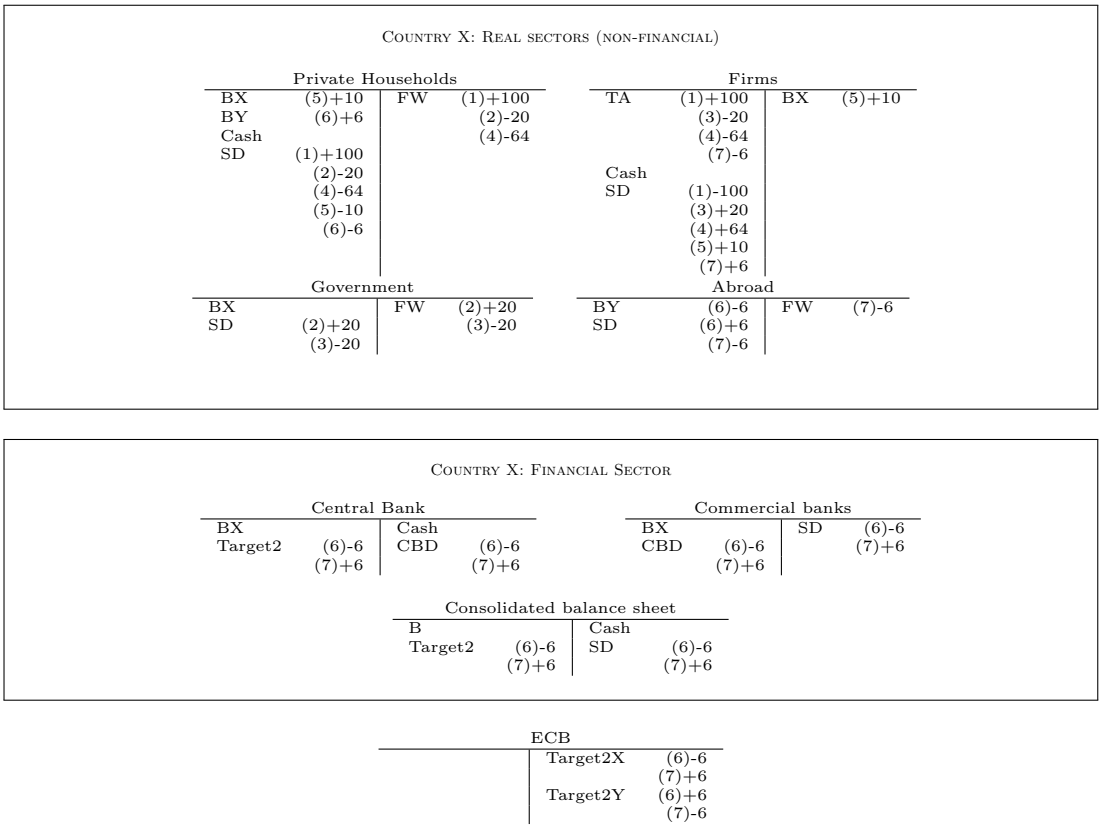
triggered by cross-border deposit relocations. The latter case is not considered as economically relevant BoP-financing since shifting liquidity from one member country to another is neither associated with purchasing goods and services nor with acquiring assets.

We describe the following flow-of-funds analysis from the perspective of the domestic economy (country X). We simplify the analysis by excluding cash payments and assume that all cross-border payments are carried out using the Target2-system. This simplification does not affect the NCBs' net position with the Eurosystem because cash and cashless cross-border payments are perfect substitutes. Given the empirical predominance of cashless transactions, BoP-financing via the Eurosystem is mainly reflected in the dynamics of the Target2-positions.

3.2 Current account financing via the capital market (case 1)

We illustrate the transactions that are carried out during one period by a numerical example (Table 2). The domestic value added of 100 euro is exclusively produced by firms. Accordingly, firms purchase domestic primary production factors from the households that in turn receive factor remunerations (wages and capital income). In a first step, their financial wealth increases by the same amount while the firms' output is put into storage and thereby increases their stock of tangible assets (1). Households pay 20 percent of their factor income as net taxes to the government (2). Assuming a balanced budget, the government purchases goods and services from the firm sector at the same amount (3). Households use 80 percent of their disposable income to buy consumer goods from the firms. Accordingly, households' financial wealth and firms' tangible assets decrease by 64 euro (4). Firms issue additional securities and sell them to households to cover their investment spending of 10 euro (5). Firms also trade with foreigners and domestic exports exceed imports by 6 euro. To acquire the necessary liquidity foreigners (RoW) sell securities on the capital market to domestic households (6). Using this liquidity, they can pay the net import bill.

Table 2: Sectoral financial and economic flows (case 1)



CBD: Central bank deposits, SD: Sight deposits, FW: Financial wealth, TA: Tangible assets, B: Securities, BX: Domestic securities, BY: Foreign securities

By assumption, all cross-border payments are channeled through the clearing system Target2. The liquidity outflow resulting from households' securities purchase (6) dislocates central bank money from the domestic to the foreign country. This transaction debits the Target2-position of the domestic NCB at the ECB. Along the reverse transaction in goods and services (7) central bank money flows back to the domestic country and the Target2-positions of the corresponding NCBs clear. At the end of the period, the original liquidity positions are restored. Hence, the liquidity provided by the financial sector was only used as a means of payment to carry out the transactions on the factor, product, and capital markets. Equal to their savings of 16 euro the households' increased financial wealth is securitized by additional domestic securities ($\Delta BX = 10$) and foreign securities ($\Delta BY = 6$). As a result, domestic investment and the foreign current account deficit are financed via the capital market.

3.3 Current account financing via the Eurosystem (case 2)

The transactions (1)-(5) known from case 1 remain unchanged (Figure 3). If foreign importers lose access to the capital market (e.g. because domestic savers consider foreign securities too risky) they may try to get additional credit from a commercial bank in country Y to pay the import bill for products from country X. This lending implies that commercial banks can fully refinance themselves at their NCB (6). Otherwise, the commercial bank runs the risk of lacking central bank money as soon as the additional credit (7) is used to process the payment (8).

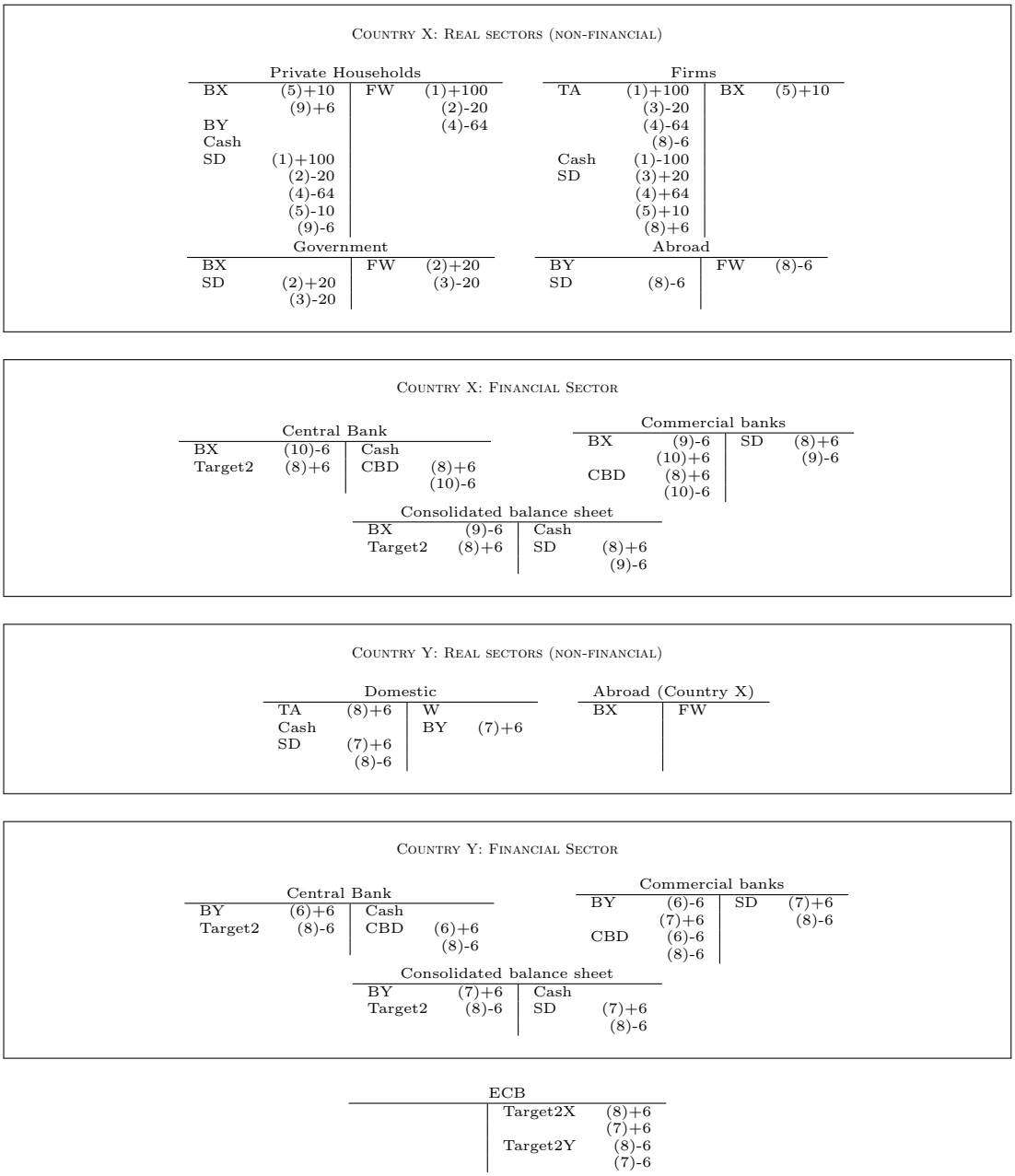
Contrary to case 1 where inflowing liquidity is used to acquire foreign securities, households in country X use this liquidity to buy back domestic securities from the domestic financial sector (9). By doing so, the liquidity that has been created in country Y is destroyed in country X. Likewise, domestic commercial banks reduce their excess reserves by decreasing their demand for central bank money in refinancing operations with their NCB (10).[4]

As a result, capital is transfered from country X to country Y although none of the domestic investors was willing to acquire securities from country Y. While the real sectors purchase back formerly sold domestic securities from the financial sector, the domestic NCB involuntarily has to accept an increase of Target2-claims. These Target2-claims are backed implicitly by the collateral (i.e. securities from country Y) that was accepted in the refinancing operation with the NCB in country Y. This mechanism suspends the efficient allocation of capital and in its role as liquidity provider the financial sector interferes in the cross-border capital market.

Again, this case requires that the central bank in country Y accepts additional collateral from country Y's commercial banking sector to expand the money base. Otherwise, commercial banks would be unable to increase lending (transaction

[4]The liquidity is only destroyed if the domestic money demand remains constant (constant liquidity preference). This is especially the case if the quantity of money is exclusively demand-driven due to the full allotment policy. Otherwise, the inflowing central bank liquidity would trigger a multiple money creation process and therefore increase the domestic quantity of money.

Table 3: Sectoral financial and economic flows (case 2)



CBD: Central bank deposits, SD: Sight deposits, FW: Financial wealth, TA: Tangible assets, B: Securities, BX: Domestic securities, BY: Foreign securities, W: Wealth

6 and 7) and the whole transaction would not take place. It remains an open question for which alternative purposes the goods and services would be used if the current account transaction was not financed via the Eurosystem but via the capital market (increased domestic absorption or higher net exports outside the euro area).

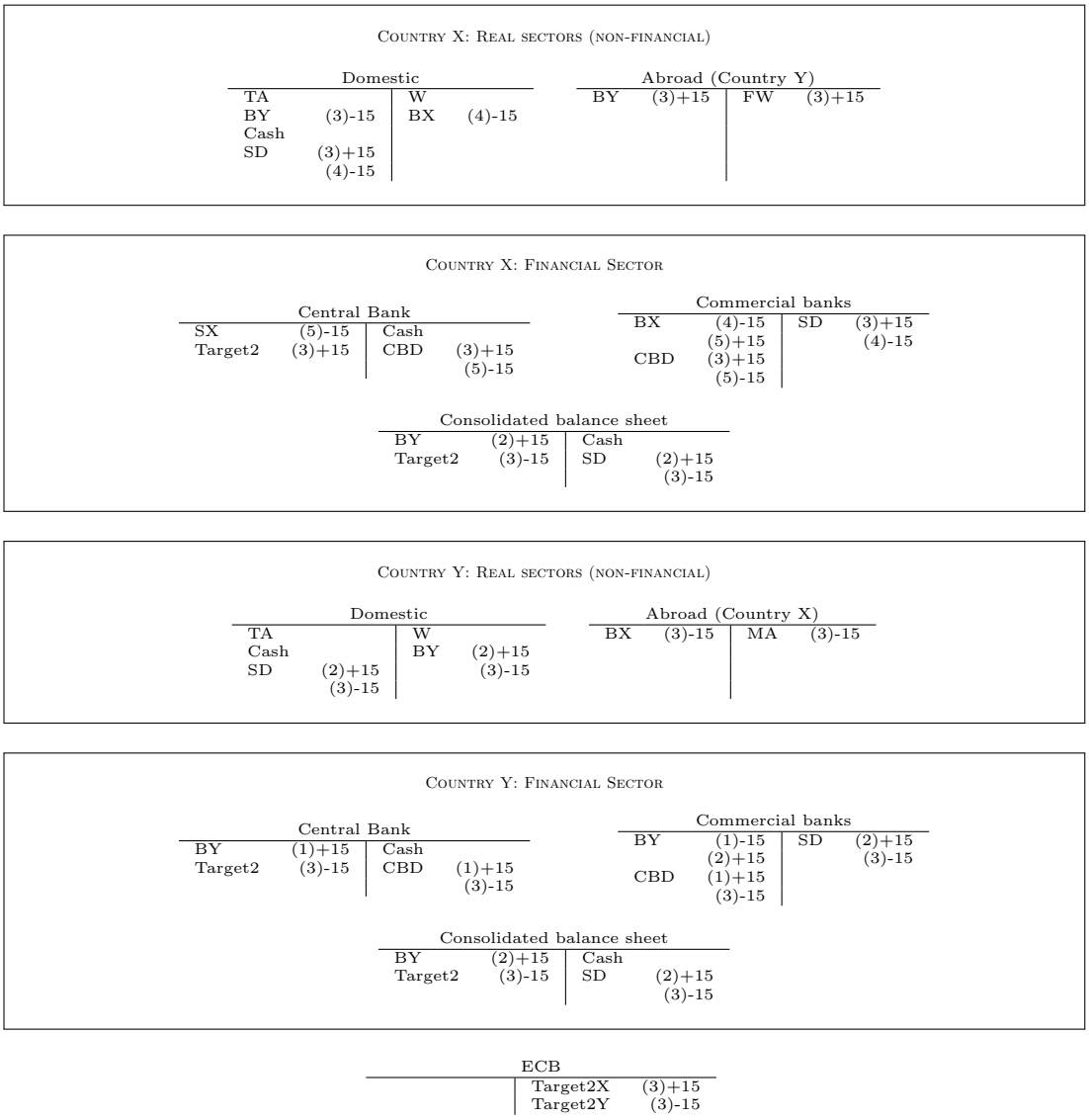
3.4 Capital flight financing via the Eurosystem (case 3)

While case 2 addresses a situation where market-based cross-border capital flows for financing current account imbalances come to a stop, case 3 deals with cross-border capital transactions for relocating financial assets that had been accumulated in previous periods. This capital flight can occur in two versions. Either investors in country X try to repatriate former capital exports (case 3a) or investors in country Y attempt to acquire assets from country X (case 3b).

An effective retrieval of former domestic capital exports (case 3a) requires a current account reversal such that the exports of country Y exceed its imports. If this does not happen the foreign assets held by domestic investors are hard to sell due to a lack of buyers from foreign real sectors. Selling them to a real sector abroad is crucial for the envisaged capital re-import from a macroeconomic point of view. Otherwise, a simple internal creditor swap in country X occurs that is irrelevant for the country's capital account. If no foreign real sector buys these assets, the domestic investors may try to sell them to the domestic financial sector in exchange for domestic securities that had formerly been acquired by the financial sector for domestic liquidity provision. As the financial sector has no reason to comply with this asset swap only the following indirect and gradual mechanism remains (Table 4). According to their maturity pattern the foreign securities must be redeemed. Assuming an average maturity of 10 periods results in periodical redemption payments of 15 euro from country Y to country X. If the debtors in country Y receive an equivalent additional credit from their commercial banks they can pay off their creditors in country X (2). Like in case 2, the foreign commercial banks must be able to use additional refinancing with their NCB (1) to carry out the cross-border payment via the Target2-system (3). The inflowing liquidity can then be used by the domestic real sector to buy back domestic securities from the domestic financial sector (4). Again, domestic

commercial banks reduce their excess reserves by decreasing their demand for central bank money in refinancing operations with their NCB (5).

Table 4: Sectoral portfolio redeployment (case 3)



CBD: Central bank deposits, SD: Sight deposits, FW: Financial wealth, TA: Tangible assets, B: Securities, BX: Domestic securities, BY: Foreign securities, W: Wealth

As a result, 10 percent of the foreign securities formerly held by domestic savers are replaced by Target2-claims of the domestic NCB. While the domestic monetary base remains unchanged its backing asset portfolio is shifted towards Target2-claims at the expense of domestic securities.

Without the additional credit expansion in country Y debtors would have no choice but to default on their debt. In this case, domestic savers would have to write-off a part of their foreign securities and a corresponding asset loss would materialize. In this way former domestic capital exports would ex post turn into involuntary capital transfers.

Beside repatriation of former capital exports (case 3a), the credit channel enables agents in country Y also to purchase assets of country X (case 3b). Regarding the monetary effects, the mechanisms are similar to those presented in the preceding figure.

The processes of repatriation of capital that we have considered for one period can be continued as long as the whole stock of the non-financial sectors foreign claims are transformed into Target2-claims of the NCB. If case 3b occurs the process could go beyond this amount. Then, the domestic NCB must incur debt with the commercial banks to the extent that the liquidity inflow exceeds the internal liquidity requirement.

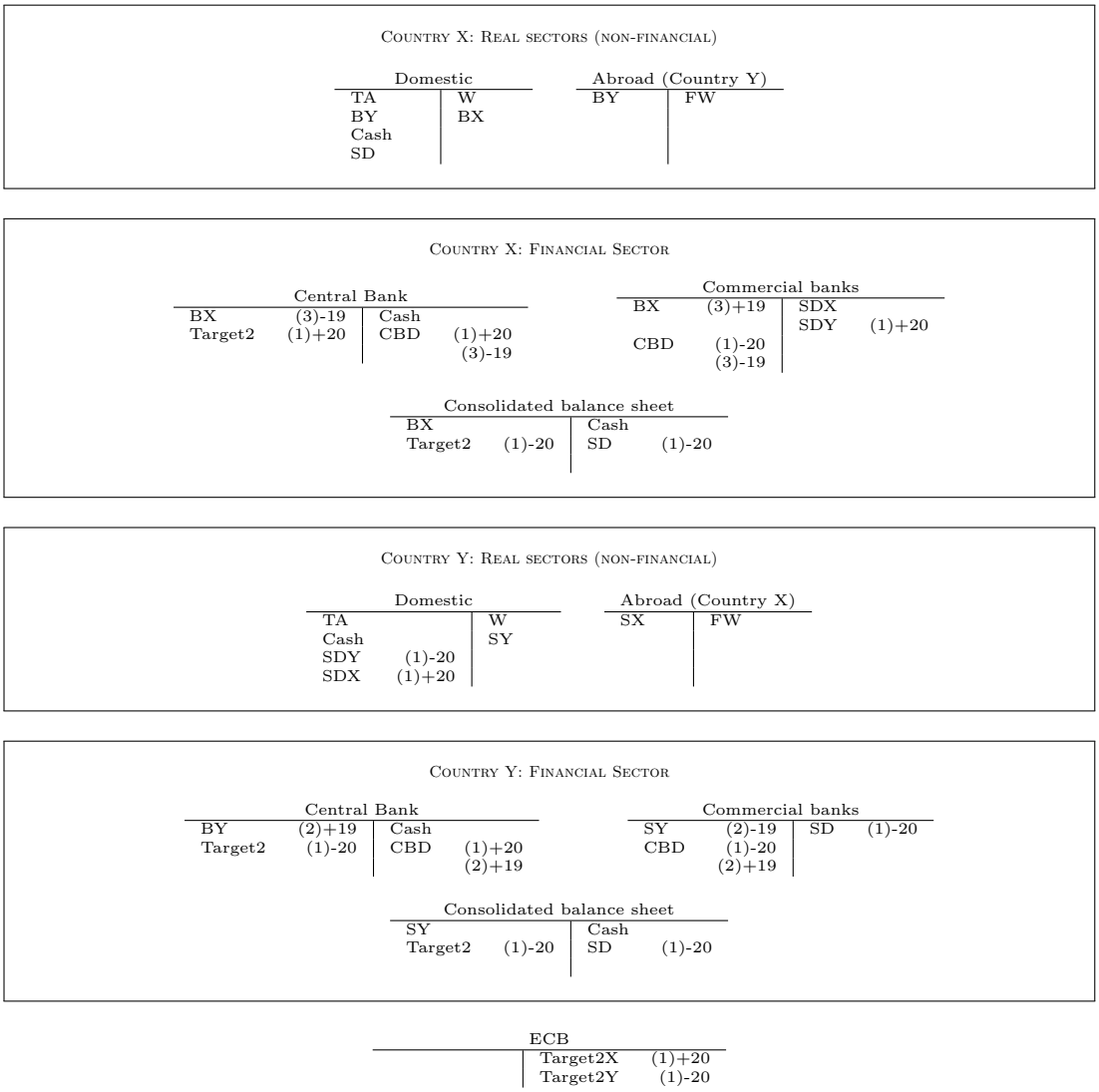
3.5 Deposit flight (Case 4)

If mistrust spills over to the foreign commercial banking sector, foreign households and firms may withdraw their sight deposits in order to transfer them to a commercial bank in country X.[5] As a numerical example, we consider a deposit shift of 20 euro: Again assuming cashless transactions, customers in country Y ask their bank to transfer a payment to a bank in country X (1). The bank deposits in country Y then consist of sight deposits at domestic commercial banks (SDY) and sight deposits at foreign commercial banks (SDX). Commercial banks from country Y process this transaction via their central bank deposits which are reduced by 20 euro. The central bank in country X credits the correspondent amount for the commercial banks at their central bank deposit accounts. Assuming a reserve requirement rate of 5 percent, the foreign commercial banks face the problem that their central bank deposits were reduced by 20 whereas their

[5] Analogously, the same holds true for withdrawals of sight deposits from residents who have a bank account in country Y. However, this case is negligible since retail banking is still a rather national business in the EMU.

reserve requirements were only reduced by 1. Therefore, they are required to sell additional securities to their NCB to refill their central bank deposits (2).

Table 5: Cross-border relocation of deposits (case 4)



CBD: Central bank deposits, SD: Sight deposits, FW: Financial wealth, TA: Tangible assets, B: Securities, BX: Domestic securities, BY: Foreign securities, W: Wealth

Reciprocally, the inflow of central bank deposits leads to excess reserves of the commercial banks in the domestic country. As long as banks do not intend to increase their lending to the non-financial sector, they can use these deposits to repurchase formerly sold bonds at the expense of central bank deposits from the central bank. Since their reserve requirement increased 1 euro, they can use

the remaining 19 euro for this repurchase transaction.

As a result, not the total amount, but the composition of the monetary base in the euro area has changed. Securities worth 19 euro from country X were replaced by securities worth 19 euro from country Y. However, this transaction can not be considered as a balance-of-payments financing. Since the private sector in country Y is still using sight deposits as money holdings. They did not use these deposits neither for the purchase of goods and services nor for the purchase of securities. The shifting of sight deposits as a consequence of a national bank run is often also termed as "'capital flight"', which is, as we have shown not appropriate.

3.6 Interpreting Target2-positions

Some observers have argued that limiting TARGET2-positions would bring the common currency to an end. In particular, cross-border payments could no longer be processed (Bindseil and König (2012)). Ff course, a euro that is circulating has to be accepted as a means of payment everywhere in the currency area no matter where it was created. While this is technically true from an ex-post perspective, it leaves the causes of the Target2-dynamics unconsidered.

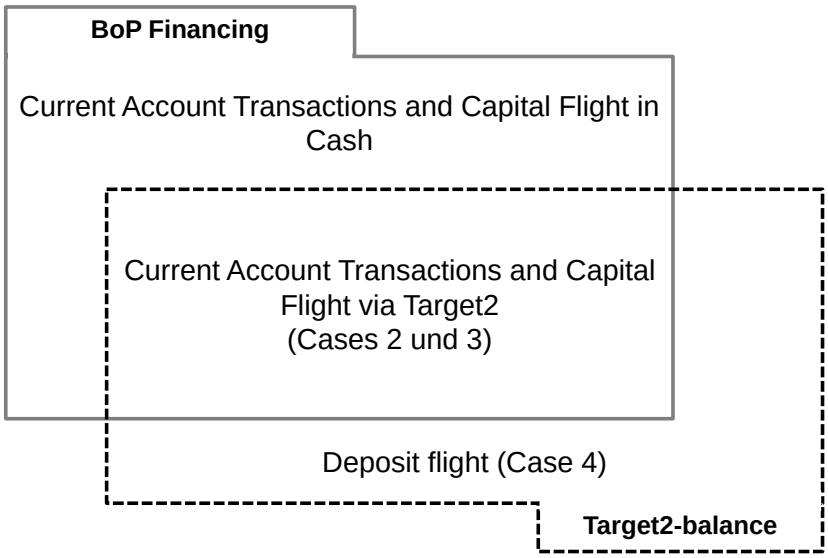


Figure 6: Balance-of-payments financing and TARGET2

As the cases 2 and 3 show, the excessive credit (and money) creation in the deficit countries brings about persistent balance-of-payment deficits that are

financed by the Eurosystem and that are processed mainly through the Target2-system. Therefore, the exploding Target2-positions are the symptom, not the cause of the problem. Or, put differently: a euro that is not created in country Y cannot flow out to country X. It is the underlying monetary regime, not the cross-border payment settlement system that is to be blamed for increasing imbalances. This would become even more obvious if all payments were processed in cash. This would produce the same balance-of-payments effects without creating any Target2-imbalances. The credit creation in the deficit countries is excessive to the extent that they create liquidity way above the level that is required for their internal needs (means of payments for transaction processing, liquidity buffer). As a result, the money market and the capital market segments of the securities market blur because liquidity is created to finance capital flows. Thus, any attempt to limit the Target2-positions must restrict the excessive credit creation in the deficit countries that are the causes of the Target2-dynamics. Once this is stopped, Target2-balances would disappear. An ex-post Target2-settlement procedure will then hardly be necessary; following the interdistrict settlement of the US Federal Reserve, this would provide that Target2-positions must be cleared bilaterally once a year by exchanging high-rated securities at market prices (i.e. the kind of collateral that surplus country NCBs would also accept in their normal refinancing operations). Clearly, the problem is that the deficit countries' NCBs do not have these securities due to weaker eligibility criteria in their refinancing operations. If all NCBs of the Eurosystem applied equally high standards the asymmetric credit expansion and - simultaneously - the Target2-dynamics would come to an end.

Next to the weaker eligibility criteria for collateral the Eurosystem's full allotment policy prevents a market-based settlement of intra-EMU balance-of-payments imbalances. If the overall monetary base was strictly limited to a normal level, commercial banks would compete for central bank money leaving some of them empty-handed. For this reason alone they would not be able to meet all credit requests from their customers. This would dampen the credit expansion in the deficit countries. To the extent that balance-of-payments deficits continue for a while, central bank money would further flow out of the deficit countries reducing their monetary base and increasing it in the surplus countries. These

opposite monetary effects would initiate a current account reversal in country Y.

3.7 Banking crises, financial intermediation and the Eurosystem as Lender of Last Resort

As soon as securitized payment promises of real sector debtors turn out to be too optimistic the respective securities must be revalued. Should, all of a sudden, a wide range of these securities be subject to substantial write-offs, a financial crisis arises. If these securities are to a large extent held by the banking sector, the financial crisis escalates into a banking crisis.

So far, we have considered commercial banks as liquidity providers only. In this role, they are particularly fragile when their assets are to be devaluated: They have no other choice but to cut sight deposits to settle their balance sheets. This would instantaneously erode trust in the banking sector and trigger a general bank run that commercial banks could not stand in a fractional reserve banking system. If the payment system collapses, additional (i.e. economically relevant) costs occur in terms of forgone transactions and lost value added. These losses can be tremendous although their magnitude is hard to specify. While the losses of the preceding misallocation of capital have already materialized, the extra losses from a crash of the banking sector are still avoidable. In the financial framework presented so far, this can only be achieved by capital injections from the tax payers. This would typically be managed in the following way: the central bank in its role as Lender of Last Resort buys the bad assets at prices above their market values and gets recapitalized by the government (i.e. by the tax payers) when losses materialize. The term LoLR is misleading in the sense that it refers to the central bank's unlimited capacity to provide liquidity. However, its loss absorption capacity is solely based on the potential tax base that backs up the central bank. Therefore, the ultimate LoLR are always the country's tax payers whose economic wealth can be mobilized by the fiscal authorities as owners of the central bank (Goodhart (1999)). To make this case as unlikely as possible, in normal times restrictive collateral eligibility criteria apply.

However, commercial banks are not only liquidity providers but they also act as financial intermediaries that bring together savers and investors from the real

Table 6: Financial positions by sector including financial sector as intermediary

Country X: Real sectors (non-financial)

Private Households			
BX	150	FW	800
BF	500		
BY	50		
Cash	20		
SD	80		

Firms			
TA	400	B	600
Cash	40		
SD	160		

Government			
B	-250	FW	250

RoW			
B	-150	FW	150

Country X: Financial Sector

Central Bank			
BX	72	Cash	60
Target2	0	CBD	12

Commercial banks			
BX	628	SD	240
BY	100	BF	500
CBD	12		

Consolidated			
BX	700	Cash	60
BY	100	SD	240
Target2		BF	500

ECB		
	Target2X	0
		(7)+6
	Target2Y	0
		(7)-6

CBD: Central bank deposits, SD: Sight deposits, FW: Financial wealth, TA: Tangible assets, B: Securities, BX: Domestic securities, BY: Foreign securities

economy. In this function, they acquire additional domestic and foreign securities from the real sectors (at an amount of 500 euro in the example of table 6) that so far were held by the private household sector. Conversely, the commercial banks issue securities BF that replace the securities from other real sectors in the households' portfolios.

With respect to their financial stability, the extension of commercial bank activities by financial intermediation services has an ambivalent effect. On the one hand, this balance sheet extension increases their overall risk exposure; on the other hand, the bank securities that are additionally issued can serve as a risk cushion that is not available in a world without financial intermediation. Which of these two opposite effects prevails depends on how the bank securities are structured. While equity capital (BFE) leaves the risks with the owners of the banks in the household sector - the only sector that has an asset base for risk absorption - in the most direct way, borrowed capital (BFB) complicates this risk shifting considerably: In the event of losses that exceed their equity base banks must either declare bankruptcy that triggers a haircut of all outstanding debt or they must call for subsidies from the tax payers. Both alternatives finally shift the losses to the real economy but they typically also trigger substantial financial stress in the economy. Of course, the lower the equity ratio of the intermediation capital the more likely becomes this financial stress scenario.

Whether financial intermediation activities increase or decrease the loss absorption capacity of commercial banks for a given write-off ratio for assets in their balance sheets depends on the degree of financial intermediation (BF in relation to their balance sheet total T) and the minimum reserve ratio (central bank money in relation to sight deposits). These variables determine the minimum equity ratio within the intermediation capital (BFE as share of BF) that shields both the outstanding sight deposits (SD) and the borrowed capital (BFB) from losses from the banks' lending business:

$$(BX + BY) \times (1 - \gamma) + EL > SD + BFB \tag{5}$$

Plugging in the above mentioned expressions:

$$[B-(1-\alpha)\times\mu\times B]\times(1-\gamma)+(1-\alpha)\times\mu\times B > (1-\alpha)\times B+\alpha\times(1-\beta)\times B \quad (6)$$

Resolving for β:

$$\beta > \gamma\frac{1-(1-\alpha)\times\mu}{\alpha} \quad (7)$$

The lower the degree of intermediation, the lower the minimum reserve ratio, and the higher the write-off ratio, the higher the minimum equity ratio of the intermediation capital must be to prevent the commercial banks from collapsing and causing financial stress (7). In the numerical example of table 7 the degree of intermediation amounts to 67.57 percent while the minimum reserve ratio is 5 percent. If 10 percent of all bank assets failed the commercial banks would require a minimum equity ratio of 14.6 percent to cover the total loss of 72.8 euro. In this case, the central bank must ask the tax payers to inject 7.2 euro of fresh capital to compensate for the losses incurred in the refinancing operations with the commercial banks. If the actual equity ratio of the commercial banking sector was only 5 percent, only a loss of 25 euro could be cushioned. The remainder of 47.8 euro would stick with the tax payers to prevent banks from collapsing. This is even more than the total loss of 30 euro (10 percent of money in circulation) that would occur if there were no financial intermediation activities of commercial banks. It must also be taken into account that the extension of financial intermediation decreases the average quality of the banks' asset portfolio. If they focused on liquidity provision only, they could selectively accept the best assets only. Therefore, an increasing degree of intermediation typically also increases their exposure to risky assets. Finally, if the central bank is protected from any losses (preferential clauses or high hair-cut ratios in their refinancing operations) the loss absorbing effect (i.e. dampening effect on required equity) of the minimum reserves disappears.

This simple example shows that – depending on the banks' equity ratios – the financial intermediation activities of the commercial banks can either relieve or strain the central bank when it comes to financial stabilization by preventing a breakdown of the banking sector. In particular, if the minimum equity ratio is

Table 7: Minimum equity ratios with respect to banks' intermediation capital

Minimum reserve requirement 5 %		Degree of intermediation									
		100	90	80	70	60	50	40	30	20	10
Depreciation rate	10	10	11.1	12.4	14.1	16.3	19.5	24.3	32.2	48.0	95.5
	20	20	22.1	24.8	28.1	32.7	39.0	48.5	64.3	96.0	191.0
	30	30	33.2	37.1	42.2	49.0	58.5	72.8	96.5	144.0	286.5
	40	40	44.2	49.5	56.3	65.3	78.0	97.0	128.7	192.0	382.0
	50	50	55.3	61.9	70.4	81.7	97.5	121.3	160.8	240.0	477.5
	60	60	66.3	74.3	84.8	98.0	117.0	145.5	193.0	288.0	573.0
	70	70	77.4	86.6	98.5	114.3	136.5	169.8	225.2	336.0	668.5
	80	80	88.4	99.0	112.6	130.7	156.0	194.0	257.3	408.0	811.7
	90	90	99.5	111.4	126.6	147.0	175.5	218.3	289.5	432.0	859.5
	100	100	110.6	123.8	140.7	163.3	195.5	242.5	321.7	480.0	955.0

Minimum reserve requirement 20 %		Degree of intermediation									
		100	90	80	70	60	50	40	30	20	10
Depreciation rate	10	10	10.9	12.0	13.4	15.3	18.0	22.0	28.7	42.0	82.0
	20	20	21.8	24.0	26.9	30.7	36.0	44.0	57.3	84.0	164.0
	30	30	32.7	36.0	40.3	46.0	54.0	66.0	86.0	126.0	246.0
	40	40	43.6	48.0	53.7	61.3	72.0	88.0	114.7	168.0	328.0
	50	50	54.4	60.0	67.1	76.7	90.0	110.0	143.3	210.0	410.0
	60	60	65.3	72.0	80.6	92.0	108.0	132.0	172.0	252.0	492.0
	70	70	76.2	84.0	94.0	107.3	126.0	154.0	200.7	294.0	574.0
	80	80	87.1	96.0	107.4	122.7	144.0	176.0	229.3	336.0	656.0
	90	90	98.0	108.0	120.9	138.0	162.0	198.0	258.0	378.0	738.0
	100	100	108.9	120.0	134.3	153.3	180.0	220.0	286.7	420.0	820.0

Source: Own calculations.

too low, the central bank can be pushed into a situation where its role as LoLR is abused for bailing out banks due to their too risky financial intermediation business. When it comes to safeguarding the economy's payments systems by stabilizing the commercial banking sector the central bank distorts nolens volens the market-based risk and loss allocation as it does no longer matter where the destabilizing losses of the commercial banks stem from (liquidity provision or intermediation activities).

As a consequence, the market-based loss absorption capacity of commercial banks must be increased. This boils down to strengthening their guarantee capital base in one way or another. Higher equity requirements would not increase the cost of capital for the real economy as it is sometimes argued. As the overall risk of the bank is backed by a higher risk cushion each unit of equity becomes cheaper compared to a situation with large leverage ratios (Admati et al. (2010)). An increase of capital cost can only occur if equity and borrowed capital are taxed differently (to the detriment of the former) or if the implicit government guarantees for systemically important banks act as a hidden subsidy for capital in the current system. If these defects are resolved the capital costs will increase only to the extent that creditors must then be compensated for risks that are so far shifted over to the tax payers. Such a correction of distorted prices would be very welcome from an ordo-economic perspective.

A significantly increased risk cushion in the commercial banks' balance sheets would pass through losses directly to the banks' owners in the real economy. As a result, future financial crises would do much less harm in the sense that write-offs in the financial sector would no longer threaten the stability of the economy's payment systems. If such a system had been in place before the outbreak of the European sovereign debt crises no supra-national rescue packages would have been necessary. It is even very unlikely that they would be politically feasible as all voters could clearly see that these rescue packages would only protect investors at the expense of tax payers. By contrast, with today's fragile financial landscape these rescue packages can still be justified by the extremely negative spill-overs of a crash of the financial system.

3.8 Capital market effects and quality of the monetary base

In the course of the cross-border transactions classified as cases 2 and 3 (current account and capital flight financing via the Eurosystem) securities that the non-financial sector no longer trusts are continuously shifted to the Eurosystem. While this happens, the European tax payers are dragged into a liability that they can not evade. Simultaneously, investors are bailed out. This misallocation of risks is aggravated by the fact that – due to the low loss absorption capacity of the commercial banks and the lack of a fiscal solution – the Eurosystem also intervenes to compensate for those losses that commercial banks make in their financial inter-mediation business. To the extent that intra-EMU BoP-imbalances are financed via national central bank money creation the capital market can no longer allocate capital efficiently and the intertemporal budget restrictions of some market participants are suspended.[6] This socializes risks and enables transactions that can not find any voluntary financing in the market. This is a very serious problem for a market-based economy. Without a binding resource restriction price signals become irrelevant which makes harmonious interactions of independently acting market participants impossible. Economically, current account imbalances are per se neither good nor bad; what matters is whether they are the outcome of market-based decisions or whether they are uphold artificially by central bank interventions. To the extent that these interventions prevent the necessary current account adjustment, the misallocation of capital in all directly and indirectly affected countries is prolonged. This situation can not be justified and clearly points at urgent policy reforms outside the central bank system.

Also, dramatically differing refinancing standards of the NCBs within the EMU push central bank money creation in those countries of the currency union that have the lowest collateral requirements – a process quite similar to Gresham's Law. As a result, the backup of the monetary base on the asset side of the Eurosystem's consolidated balance sheet shifts more and more towards securities

[6]This defect does not only affect cross-border allocation of capital but is also relevant within the domestic economy. When zombie banks are kept alive they tend to prolong financing unproductive firms that are too big to fail from the bank's perspective given the huge amount of outstanding credit (Caballero et al. (2008)).

from the deficit countries, thus reducing the money quality in the entire euro area. This effect is further pushed by the deposit flight out of those countries whose banking industries are particularly fragile (case 4).

4 Outlook: Risks for EMU stability

The Eurosystem's permissive monetary policy stance reflects primarily the aspiration to buffer the effects of abrupt redirections of capital flows (capital account reversals or "sudden stops" of capital inflows). On the flipside, this argument implies to continue the process of misallocating scarce savings within the Euro area ("pouring good money after bad"). The fact that investors have overlooked the poor creditworthiness of the borrowers for a long time can not justify this process. Economic actions must be forward-looking and operate at the relevant margin instead of mourning at the errors of the past. Monetary policy in its current crisis mode is running the risk of turning a well-meant shock buffering intervention into an insolvency delaying maneuver. While balance-of-payment financing via the Eurosystem softens the market-enforced credit constraint ("buys time") it simultaneously retards the indispensable adjustment processes in the deficit countries' real economies ("wastes time"). Also, the idea of dampening the adjustment process by applying unconventional monetary measures over many years might finally change the underlying policy framework and erodes the credibility of the monetary authorities.

4.1 Quantitative easing and efficiency of interbank markets

By adopting a full allotment policy, the Eurosystem passed over to a form of quantitative easing that leaves the quantity of central bank money to be fixed by the demand side of the market. However, the sheer expansion of the monetary base does not directly increase the risks of monetary policy. As the longer-term refinancing operations are indexed to the main refinancing rate, the monetary authorities will be able to influence the future money market interest rate according to the outcome of their economic and monetary analysis. In case that the money multiplier picks up and expands the monetary aggregates via a more

aggressive credit creation of commercial banks, the Eurosystem could effectively increase interest rates and thereby making the credit expansion less profitable. Furthermore, the Eurosystem could offer term deposits or debt certificates to absorb the excess central bank liquidity. However, this would usually imply higher risk-adjusted interest rate offers than those that commercial banks could earn in the market. Therefore, the Eurosystem must be prepared to suffer losses in these operations. Finally, the Eurosystem could increase the minimum reserve requirements in order to tie up outstanding high powered money in a regulatory way. Thus, from a purely operational point of view, the central bank system has effective instruments to dampen inflationary pressures by absorbing excess liquidity.

However, the full allotment policy creates other risks. Firstly, the Eurosystem has made parts of the interbank money market obsolete (or literally "superfluous") by providing unlimited access to central bank money for individual commercial banks. This negatively affects the efficient allocation of liquidity within the financial system. Typically, refinancing conditions among commercial banks vary according to their individual risk position which is no longer the case if all banks have access to fresh central bank money irrespective of their risk exposure. In an extreme case, this could even leave banks alive that would go bankrupt if market conditions applied. This distortion within the banking industry shows up in the fact that liquidity creation of the Eurosystem works mainly via those counterparts that are cut off from the interbank market or that would have to pay higher interest rates in the market. Thus, the full allotment policy dampens the incentives of individual banks to strengthen their equity base. Secondly, a continued monetary stance of quantitative easing might lead commercial banks to neglect their internal liquidity management. Once they get used to ultra-generous liquidity provision by the central banks they will run into managerial problems should the access to central bank liquidity be normalized later on. Finally, the vast provision of central bank liquidity becomes a hidden form of financing government deficits to the extent that commercial banks use the fresh money to buy public bonds (Hoogduin and Wierts (2012)).[7]

[7]At the beginning of 2012, commercial banks heavily expanded lending to the public sector. Liquidity from the 3-year refinancing operations was mainly used to buy Spanish and Italian government bonds (Deutsche Bundesbank (2011)).

4.2 Qualitative easing and credibility of monetary policy

As long as the Eurosystem accepts first-class collateral only, the massive expansion of the monetary base does not generally threaten the credibility of the monetary authorities because the assets held by the Eurosystem are valuable enough to fully absorb the outstanding central bank liquidity. However, by lowering the underlying qualitative requirements of refinancing operations (qualitative easing) the Eurosystem takes risks on its balance sheet if future losses exceed the precautionary hair-cuts on less qualitative collateral that the central bank made according to their risk analysis. Therefore, the strategy of qualitative easing does not increase central bank risks per se. But, this can change dramatically as soon as systemic risks materialize. In this situation, the Eurosystem might incur substantial losses that require instantaneous recapitalization of the affected central banks in order to safeguard the property backing of the monetary base. This backing is the key prerequisite for the central bank's capacity to sterilize its outstanding liquidity without which the central bank would no longer be a credible actor in the financial markets (Lehmbecker (2008)). Because a central bank with negative equity gives an unambiguous signal to all market participants (i.e. all users of money) that she is no longer able to fully control the money stock and the confidence in the currency is damaged immediately. As a result, inflation expectations may pick up way before the output gap is closed. If this happens the monetary authorities face a clear policy dilemma. Either the policy of qualitative easing is stopped - causing then all the turbulences why this policy was started in the first place - or the Eurosystem must let inflation take its course and violate its primary policy goal of price stability.

The recapitalization of the Eurosystem's NCBs (and the ECB as their subsidiary) relies on transfers from the tax payers of the countries that own them (Buiter (2008)). This brings central banks with recapitalization needs in direct dependence of the government. Moreover, a precarious situation can arise if the owner country itself is in financial difficulties due to a large sovereign debt level that cuts the country off from access to capital markets. This is particularly likely for countries with distressed banking systems as the latter are the very reason why the strategy of qualitative easing had been adopted in the first place. Consequently, it is highly questionable whether the governments of the most af-

fected countries will be able to fulfill their obligation to inject fresh capital in their central banks.

The value of money is not influenced by a hypothetical basket of goods that it can buy but rather by the quality of assets that it was created from. It would be grossly negligent to believe that the feature of legal tender would guarantee the acceptance of a currency under all circumstances. The history of money teaches the contrary (Stella (2002)). The property-backing of money is not a luxury but the key prerequisite for money to be accepted as a means of payment. The formal fact that a central bank can not become illiquid does not protect it from insolvency - and hence not from a loss of confidence. Without trust in the value of money (i.e. in the money backing assets) the central bank's unlimited capacity to increase the quantity of money becomes worthless. Only the capacity to absorb outstanding liquidity anytime via free market operations creates trust in the value of money.

4.3 Persistence of Target2-positions

The Target2-positions that have been compiled so far reflect to a large extent a misallocation of capital within the euro area and a massive risk shifting away from private investors to the public sector. The resulting losses due to economic distortions have already materialized, they can not be corrected ex post. As those individual investors that benefited from the Eurosystem's balance-of-payments financing are hard to identify it is impossible to accurately skim off their extra profits by the government.

If the Eurosystem returns to EMU-wide uniformly restrictive collateral eligibility criteria and stops the full allotment policy, the Target2-dynamics will come to an end. Of course, the so far built-up Target2-positions will continue to exist for the time being. There is no mechanism to cause balance-of-payment imbalances in the reverse direction that would melt Target2-positions down. However, the resulting problems are most likely of a transitory nature (with respect to seigniorage profits Target2-positions are neutral anyway). Parallel to the process of piling up Target2-positions the consolidated balance sheet of the Eurosystem underwent a continuous swap of assets: assets from surplus countries were re-

placed by assets from deficit countries. To the extent that the latter represent less secure collateral, the quality of the euro area's monetary base decreased. This holds all the more for the bad assets of those central banks that – due to the fiscal problems in the owner countries – could not be recapitalized by their governments if write-off induced losses materialize. In order to safeguard the property-backing of the Euro, the bad assets in the Eurosystem's balance sheet constitute a tacit obligation to inject fresh capital for all solvent member countries.

The normalization of monetary policy would slowly but surely take the tension out of the system. A return to EMU-wide high collateral requirements for new refinancing operations implies that dubious assets are gradually replaced by first-class collateral. The same applies to those securities bought by the ECB when they become due. Even if Target2-positions persist under these circumstances, they will have lost their explosive effect in the end. It is even conceivable that the involved central banks will come to an agreement to settle excessive Target2-positions as their collateral will then be of equally high quality.

4.4 National segmentation and European disintegration

If the banking crises in the deficit countries continue to smolder and if the Eurosystem keeps up its current monetary stance then the increase of Target2-positions will be unstoppable due to asymmetric money creation in the EMU. This holds serious risks for the survival of the monetary union in its current shape.

The country-specific design of refinancing operations deepens the monetary segmentation within the euro area. Due to the dominance of national banking supervision/regulation and the variety of country-specific collateral in refinancing operations the EMU was from the start a fragmented system rather than a truly integrated currency area (Padoa-Schioppa (1999) and Heinsohn and Steiger (2011)). Supranational structures for monetary policy remain still to be established. Eased collateral eligibility criteria as well as refinancing facilities that apply to individual countries only (e.g. ELA credits) produce an unlevel playing field. This allows national central banks to expand their balance sheets according to varying rules while the resulting risks are passed to the Eurosystem as a whole

(Bagus (2010)). Even though the liability for ELA credits stays de jure with the national central banks their recapitalization in case of unhedged losses might fall back to the more solvent member states if the respective country is financially too weak to raise the necessary funds. This creates de facto joint guarantees and increases incentives to free-rider behavior that boosts tensions among the member states. An extreme case of such an unbalanced mechanism of national money creation was observed in the run up to the crash of the ruble zone 1992-1993.

The exit of a country from a common currency generally causes costs of monetary disintegration for all parties. However, the Target2-positions create diverging extra costs and benefits for surplus and deficit countries. While an uncooperative exit of a surplus country might imply a total loss of its Target2-claims, the same uncooperative exit of a deficit country holds out the prospect of significant one-time gains. Therefore, continued balance-of-payments financing via the Eurosystem shifts the cost-benefit-calculus of deficit countries more and more in the direction of an exit. At the same time, the bargaining position of the surplus countries to stop this process becomes weaker and weaker. As a result, the Target2-dynamics contribute dramatically to the economic and political disintegration of the euro area.

4.5 Target2-positions and EMU stability

The guarantee for Target2-claims that is commonly shared by all EMU member states creates countervailing wealth and risk effects from a purely national perspective depending on whether the EMU survives (by and large in its current composition) or not.

If the euro area continues to exist, investors from a surplus country are given the opportunity to repatriate their former capital exports to crisis countries (case 3a) and thereby to shift the financial risks to the community of all EMU tax payers. Therefore, the Target2-system acts like an insurance system (with excess according to a country's ECB capital share) for former capital exports from the surplus to the deficit countries. Of course, while this is a macroeconomic gain from a national perspective, the hardly justifiable intra-national redistribution of risks between tax payers and investors remains. If the EMU breaks up totally, the

Euro-denominated claims of a surplus country vis-à-vis the deficit countries are under fire anyway. The current monetary policy stance aggravates this problem as it allows for a further increase of these claims (case 2) that otherwise would not happen. Capital flight out of the deficit countries (case 3b) works in the same direction. This makes it more and more costly for the surplus countries to leave the single currency area. In the case of Germany an amount worth of 715 billion euro (June 2012) would be necessary to recapitalize the Bundesbank if all German Target2-claims would be lost. While this scenario is an extreme case it nevertheless affects political decision making today. As it substantially weakens the surplus countries' bargaining positions, agreements among surplus and deficit countries for contingent rescue funds (e.g. fiscal rules) become less credible given that sanctions are hard to enforce due to the surplus countries' wealth positions that are at stake.

5 Conclusion and therapy

Massive quantitative and qualitative easing in the Eurosystem's monetary policy stance have been the visible marks of its response to the turbulences in the financial sector for more than four years now. This policy aims primarily at maintaining financial stability in the Euro area by giving unlimited support to commercial banks that operate in nationally segmented banking systems, a problem that is further aggravated by the sovereign debt crises in some member countries. Central bank money is provided more and more asymmetrically within the single currency area. Countries with banks that are lacking access to market financing continuously increase their share in Euro area-wide money creation. Diverging collateral eligibility criteria of national central banks are feeding into this process. As a result, competition in the commercial banking market is heavily damaged and capital market flows between deficit and surplus countries are indirectly substituted by money market operations of the central banks. The latter are more and more engaging in substantial balance-of-payments financing and financial risks are shifted away from investors to European tax payers via the Eurosystem. Symptomatically, these harmful side-effects show up in exploding Target2-positions in the national central banks' balance sheets.

A currency regime whose key principles are suspended in times of financial turmoil clearly reveals that it lacks a well-designed rule-based policy framework. More than ever, the rules for the monetary and lending system must apply in critical times in order to prevent an abuse of the central bank monopoly. While financial stability is a key prerequisite for a workable money-based economy it can not be maintained by an ever increasing supply of central bank liquidity. Instead, a loose monetary policy stance just whitewashes the fundamental structural problems in the financial system. By doing so, the monetary authorities run the risk of missing their primary goal – providing a stable means of payment – by putting their credibility at stake. The permanent use of measures that are at best effective in the short run does not solve the problem but creates new ones. Even the often cited fire brigades must take care that their water for fire-fighting does not do so much harm to the foundations of the burning house (and those of its neighbors) that this damage outweighs the loss of values that the fire can ever destroy.

A workable policy framework must assign specific instruments to non-identical goals as it is the case for money supply on the one hand and financial stability on the other. Otherwise, policy design problems are inevitable (Tinbergen (1966)). With monetary policy having only one independent instrument at hand (provision of high powered money) a policy dilemma becomes inevitable as long as the quasi-fiscal goal of protecting financial stability continues to be tacitly delegated to the Eurosystem due to the inactivity of the fiscal authorities.

The policy framework for the EMU must ensure that future monetary policy follows uniformly restrictive collateral eligibility criteria in all member states and that high powered money is provided along the requirements for means of payments of the non-financial sectors in an environment of price stability. This implies the end of the full allotment policy. Whether or not the two-stage central bank system continues is of minor importance. The important thing is to overcome the nationally segmented banking markets via a Euro area-wide centralized banking regulation that effectively ensures a truly monetary integration of the single currency area. However, a further centralization of fiscal policies (fiscal union) is not only unnecessary for the sake of a workable monetary union, but, on the contrary, would be counter-productive (Sievert (1993)).

It is indispensable to complement the monetary policy framework laid down in the Maastricht treaty by a financial market framework that fully relieves the monetary authorities from the responsibility of financial market stabilization. This requires mechanisms that dramatically increase the loss absorption capacities of commercial banks. In an extreme case, this mechanism must allow for orderly liquidations of important banks in a systemically prudent way (Dewatripont and Freixas (2012); Schoenmaker). This would establish a powerful firewall between the liquidity providing departments (protection of payment systems) and the investment departments (financial intermediation) of commercial banks. These firewalls would allow for the insolvency of large private and public borrowers without the risk of disrupting the money circuit and the real transactions depending on a smooth functioning of the payment systems. Only in this way, the major pillars of the Maastricht treaty – the no-bail-out clause and the ban on monetization of public debt – can be credibly reestablished.

Contingent convertible bonds (in short: CoCos) are a well-suited instrument to impose the liability principle in the financial sector and they should become the standard borrowing vehicle for capital market activities of commercial banks (Flannery (2005)). Currently, higher equity buffers are discussed along the Basel III reform. From a regulatory point of view this approach is extremely demanding as it raises serious problems of asset and risk evaluation. CoCos ease this problem considerably as they are much more simple to implement. Their key regulatory instruction consists in prescribing to all commercial banks compulsory debt-equity swaps for all newly borrowed capital that come into effect as soon as their equity ratio falls below a given threshold. The resulting stock dilution effect would directly strengthen the bank managers' incentives to more risk aware business models. At the same time it would be left to the individual banks to develop their own risk models which would reduce harmful herd effects (Dewatripont and Freixas (2012)).

Such a wide-ranging restructuring of commercial bank refinancing can not be accomplished overnight. Therefore, transitory solutions are necessary. Broadly speaking, we propose the following approach: As long as banking regulation and supervision is still a national domain the individual member countries should set up bank liquidation institutions (BLI) that kick in when an important bank's

equity is depleted in order to wind up failing banks in a systemically prudent way via compulsory recapitalization. In case that a member state is unable to provide funding for its national BLI a similar Euro area wide BLI takes over that is backed by all Eurosystem member countries according to their ECB capital shares. As soon as uniform banking regulation rules are enforced by a single banking supervision authority the national BLIs can be closed. Only their European pendant continues to exist. Its importance will diminish over time in line with a broader use of CoCos for commercial bank refinancing.

The compulsory recapitalization is extremely unattractive for the former owners of the banks because their investment will be lost completely before the BLI comes into play. Thus, bank managers have a strong incentive to prevent such a "rescue case" from happening. The concentration of public resources on bank recapitalization is preferable to the current EFSF/ESM scheme as it works in a much more focused way. Rescue programs for sovereign debts shield all investors from possible losses, banks as well as non-banks. This involves wrong incentives for all investors and a more than necessary redistribution of wealth away from the European tax payers in the favor of savers. Furthermore, the fiscal rescue packages require far-reaching interventions in the fiscal competences of the recipient country that are very difficult to handle among sovereign states. The BLI approach focuses on commercial banks only and uses their full loss absorption capacity. Of course, this implies that member states can go bankrupt which is exactly what the Maastricht treaty's no-bail-out clause is all about.

The Eurosystem's exceptional monetary situation can not be strained forever. Therefore, the necessary reforms must be put in place as quickly as possible. The longer the monetary stance persists in crisis mode the stronger the centrifugal forces (tensions between surplus and deficit countries) become that in the end might burst the single currency. Simultaneously, the credibility of the monetary authorities weakens the longer it is forced into the policy dilemma of monetary policy and financial market stability. This credibility is the one and only anchor in a fiat money system. Once the reputation of the Eurosystem is lost, it becomes extremely costly to rebuild it.

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