

Payment systems in a multinational currency union¹

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Abstract: Since 2011 a heated debate about TARGET2-balances is waging. Although most arguments have been exchanged multiple times, a central bank based approach is still missing. This paper contributes an integrated perspective on the interwoven issues of the choice of settlement asset, structures and economics of large-value payment systems, central bank governance and accounting. Finally I discuss alternatives to the current architecture of large-value payment systems and to the setup of the TARGET claims and liabilities between the Eurosystem's central banks.

Keywords: large-value payment systems, central bank money, settlement, central bank governance, Eurosystem, TARGET2-balances

JEL-Codes: E42, E58

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1 Introduction

Shortly after initial contributions by Sinn (2011) and Deutsche Bundesbank (2011) the so-called TARGET2 balances have attracted lots of economists and bankers to contribute to a heated debate. While some papers point out more technical issues such as the mechanics of the TARGET2 balances (Jobst et al., 2012) others have concentrated on recent issues such as the connection to the Eurosystem's asset purchase programmes (Eisenschmidt et al., 2017). Some stress purported risks (Fuest & Sinn, 2018) or rather the absence of such risks (Ulbrich & Lipponer, 2011; Hellwig, 2018). Some authors concentrate on reform proposals for the Eurosystem's architecture including TARGET2, although more from an economist's point of view (Krahnert, 2018; Fiedler et al., 2018) rather than arguing about the technical market infrastructures reform 'Vision 2020' as communicated by the ECB (2018b). At a first glance it seems to be hard to add anything new to a year's old debate which appears to be primarily 'fought' in Germany.² Having reviewed a lot of these texts, one could come to a conclusion akin to a quote by German comedian Karl Valentin (1882-1948):

"Everything has already been said, but not yet by everyone."

However, the purpose of this paper is to contribute some aspects in the debate on TARGET2 balances from an integrated central banking perspective which have so far been missing from the aforementioned debate. The basic question to which all this boils down to is, whether alternatives to the current architecture of large-value payment systems and to the setup of the TARGET claims and liabilities between the Eurosystem's central banks could be possible. To my knowledge, such an approach cannot be found in the literature as of today.

Attributions like "TARGET loans" (Sinn & Wollmershäuser, 2011) or rather emotionally "A madness called Target 2" (Mayer, 2018), "Target2 – The Eurozone's silent bailout system" (Blake, 2018) cannot be undone. Actually, many papers can mislead the readers in a way that they confuse the payment system with the Eurosystem's monetary policy actions before and during the great financial crisis 2008 and the European sovereign debt crisis since. Still it is worthwhile to take a step back and have a look at the interwoven issues of payment system architecture, financial stability oversight, monetary theory, accounting and monetary policy implementation within the framework of a currency union. In other words, an integrated perspective of central banking would help. Following Ugolini (2018) central banking is to be understood as "*a family of public policies aimed at fostering monetary and financial stability, whose provision is nowadays generally (albeit not necessarily) performed by those organizations that we call central banks*".

The paper is organised as follows: After a brief review of related literature, the use of central bank money in payment systems will be addressed in chapter 3. Economic aspects such as public goods and the microeconomics of financial market infrastructures also fit well into this chapter as do issues of the settlement of payments and its connection to the often neglected account keeping. Chapter 4 introduces the idea of a decentralized system of central banks of issue for a currency area with emphasis on the Euro area as a natural example but also looking at a contemporary system (Federal Reserve System of the USA) and a historical exam-

² Lots of texts especially in the press, books and in the blogosphere are actually written in German only, thus making aspects of the debate largely unavailable to non-German speakers.

ple (West-German central bank system of the Bank deutscher Länder, 1948-57). Chapter 5 will then combine the insights of the two previous chapters and shed light on the technicalities of intra-[Euro-]system balance sheet positions stemming inter alia from the settlement of payments. With these aspects in mind, chapter 6 then finally discusses alternative solutions for the setup of Large-Value Payment Systems (LVPS) in a multinational currency union. Chapter 7 concludes.

2 Related literature

Only few authors take a really integrated perspective onto central banking whereas most concentrate on macroeconomic aspects and / or monetary policy only. Among the former, certainly Goodhart (1987, 1988) and Giannini (2004/2011) deserve mentioning in the first places. Very recently Borio (2019) added insights on the elements of a well-functioning monetary system. The volume edited by Summers (1994) gives valuable insights into the topic of payment systems and central banking from a time when many newly independent countries were to establish their own central banks and financial market infrastructures. The role of central bank money in payment systems is explored by CPSS (2003) whereas Bindseil (2004) adds the aspects of monetary policy implementation from a theoretical perspective and the same author (2018) takes a less Anglo-centric view on the origins of the lender-of-last-resort function of early central banks similarly to Ugolini (2018). More generally, historically oriented studies on central banking such as those by Roberds & Velde (2016) or Jobst & Ugolini (2016) give the reader valuable information on the evolution of institutions and the monetary system in general. Schnabel and Shin (2018) extend their findings from the 1620s to aspects of central banking in the digital age.

Textbooks on central banking are still rare. Moenjak (2014) concentrates on monetary and financial stability with only very few regards to the payment system. Herger (2016) focusses in his small booklet for the German market on aspects closely related to monetary and currency policies, occasionally shedding light on some more general aspects. Furthermore nearly all central banks as well as the International Monetary Fund (IMF), the Bank for International Settlements (BIS) and its committees have published amounts of literature about their respective institutions for different target groups of readers, sometimes even with a didactical approach. One book available from the European Central Bank (Kokkola, 2010) explains the payment system and shows the landscape in the euro area and is thus very relevant for the topic presented in this paper. However, it already gets almost outdated by technical and institutional progress. A new addition to the textbook literature is Berndsen (2018) who informs about money, financial market infrastructures and payments in a metaphorical way by guiding through an imaginative warehouse.

3 The Use of Central Bank Money in Payment Systems

3.1 Payment Technologies

Payment systems enable the transfer of money between accounts that can be held by different persons at different financial institutions. It's mainly payment systems which make sure that a settlement asset has the function of medium of exchange. Only settlement assets which possess all three functions – the others being a unit of account and a store of value – are money. Money comes in different forms. By far the most important form is nowadays money held on accounts at commercial banks, i.e. a claim of a person against a monetary financial institution (McLeay et al., 2014).

Any transfer of this cashless form of money within one bank would exclusively affect the accounts of two customers of that bank. Depending on the intensity of competition in the market for bank services and consequently on the size of a bank measured in terms of liabilities towards their customers, this in-house handling of payments may be more or less important in a given economy.

In most countries, a typical transfer of cashless money would however involve at least two different banks. The processing of such a payment leads in the simplest case to a claim of one bank against the other bank, i.e. an increase on the account that the bank of the payment recipient holds at the bank of the sender (Rule, 2015, p. 5-6). This interbank claim comes with credit and liquidity risks that banks are typically not willing to bear if at a given level of cost there is a less risky alternative. Processing the payment through accounts held at a central bank – i.e. the monopolist provider of the monetary base for a given currency – reduces both types of risk to zero (Kokkola, 2010, p. 44). Therefore payments will normally involve a change of ownership of commercial bank money and a transfer of central bank money (Jordan, 2018).

Transfers that only involve an exchange of claims against a central bank (other than banknotes) are also frequent. The necessary condition for such a transaction is the access to an account at the central bank. There is a variety of access conditions to central bank accounts around the globe. Very generally, commercial banks have access, whereas non-banks (other than the government) would not have access to central bank accounts. The central banks' rules differ across countries mostly with respect to access of non-bank financial institutions to central bank accounts. Examples include payment service providers, clearing houses, securities firms, non-bank credit card issuers, insurance companies, etc. (CPSS, 2003, p. 26-29). Often this corresponds to the way that financial supervision is exercised.

Most interestingly, the topic of access to central bank money has gained much more attention in the last few years since it is related to two separate debates: On the one hand, the distributed ledger technology (DLT) allows for issuing private currencies as well as a digital form of central bank money which would no longer rely on a central ledger of accounts. The implications for monetary policy and central banking in general are very far reaching (CPMI & MC, 2018) and cannot be elaborated at this place. Interesting from a monetary theory perspective is certainly the link to thoughts of the Austrian School of Economics, especially Menger, von Mises and von Hayek (Sechrest, 1993). On the other hand, a debate around the

time of the Swiss referendum on sovereign money highlighted the idea of an access to central bank reserves for all which would have left commercial banks with a limited business. Similarly, reduction in the usage of cash in Sweden made the Riksbank think about digital alternatives in its E-Krona reports. Again the implications for the monetary system and central banking would be very far-reaching (Sveriges Riksbank, 2018). Some authors, e.g. Niepelt (2018), find the macroeconomic effects of reserves for all not as far reaching as previously thought. These studies are very interesting in in order to take a different perspective on the monetary system. But as of today large-value payment systems (LVPSs) process the major part of money transfers (measured by the value) and will most probably continue to do so for the foreseeable future.

It is quite common that the central bank of a given currency area owns and / or manages the LVPS and sometimes even does the same for retail payment systems. The BIS Statistics Explorer provides the details. The establishment of instant payment solutions for retail payments apparently lets some central banks get closer to that branch of the payments universe. Since this is a separate topic, I will concentrate on LVPS in what follows. In any case, the net positions of the participants in retail payment systems as well as the cash-legs from the securities and derivatives clearing positions will also settle in a LVPS.

Name of country/institution	System	Type	Settlement	Owner	Manager
		LVPS = large-value payment system RPS = retail payment system FX = foreign exchange settlement system FPS = fast payment system	RTGS = real-time gross settlement MN = multilateral netting BN = bilateral netting G = other gross settlement BA = batch settlement	CB = central bank B = commercial bank PA = payment association O = Other	CB = central bank B = commercial bank PA = payment association O = Other
Argentina	MEP - Medio Electrónico de Pagos	LVPS	RTGS	CB	CB
Australia	RITS	LVPS	RTGS	CB	CB
Brazil	STR	LVPS	RTGS	CB	CB
Canada	LVTS	LVPS	MN	PA	PA
China	HVPS	LVPS	RTGS	CB	CB
Hong Kong SAR	HKD CHATS	LVPS+FX	RTGS	CB	B ¹
	USD CHATS	LVPS+FX	RTGS	B	B ¹
	EUR CHATS	LVPS+FX	RTGS	B	B ¹
	RMB CHATS	LVPS+FX	RTGS	B	B ¹
India	RTGS	LVPS	RTGS	CB	CB
	NEFT	LVPS+RPS	MN	CB	CB
Indonesia	BI-RTGS	LVPS	RTGS	CB	CB
Japan	BOL-NET	LVPS	RTGS	CB	CB
	FXYCS	LVPS	RTGS	B	B
Korea	BOK-Wire+	LVPS	RTGS	CB	CB
Mexico	SPEI	LVPS+RPS+FPS	MN	CB	CB
	SPID	LVPS	MN	CB	CB
Russia	BESP System	LVPS	RTGS	CB	CB
	National Settlement Depository (NSD)	LVPS+RPS	RTGS, BA	B	B
	VER	LVPS+RPS	G	CB	CB
	MER	LVPS+RPS	G	CB	CB
	Payments using letters of advice	LVPS+RPS	G	CB	CB
Saudi Arabia	SARIE	LVPS+RPS	RTGS	CB	CB
Singapore	MEPS+(IFT)	LVPS	RTGS	CB	CB
South Africa	SAMOS	LVPS+RPS	RTGS	CB	CB
Sweden	RIX	LVPS	RTGS	CB	CB
Switzerland	Swiss Interbank Clearing (SIC)	LVPS+RPS	RTGS	O ¹	CB
Turkey	EFT ¹	LVPS+RPS	RTGS	CB	CB
United Kingdom	CHAPS Sterling	LVPS	RTGS	CB	CB
United States ¹	CHIPS ²	LVPS	MN, BN, G	B	B
	Fedwire Funds Service	LVPS	RTGS	CB	CB
	NSS ¹	LVPS	MN	CB	CB
European Union	TARGET2	LVPS	RTGS	CB	CB
	EURO1 / STEP1	LVPS	MN	PA	PA

Table1: Large-Value Payment Systems in member countries of the Committee for Payments and Market Infrastructures (CPMI); source: BIS Statistics Explorer, Table PS1: Features of selected payment systems (excerpt)

The reasons for the involvement of the central bank in LVPS are on the one hand of a historical nature. The establishment of central banks can in some cases be traced to the necessity of a neutral entity for the settlement of inter-bank-transactions (Norman et al., 2011). Even in the other cases, when a central bank was founded by the government or at least using a

privilege issued by the sovereign, this government’s bank could be the most trustworthy and possibly biggest financial institution around, thus taking naturally the role of a neutral inter-bank payments agent. More recently, banking regulation may also have played a role, especially liquidity regulation for commercial banks. In their role as overseers of the payment and security settlement systems, central banks have since January 2001 formalised their expectations inter alia towards the usage of central bank money in payment systems (CPSS, 2001, Core Principle VI). Since the CPSS-IOSCO-Standards have entered into force, Principle 9 regulates the use of central bank money as settlement asset in financial market infrastructures in general (CPSS-ISOSCO, 2012).

Additionally, central banks may be the only institutions in a currency area that allow a bank as sender of a payment to address every other bank. This is so because every commercial bank will find access to the central bank useful for funding or just because a minimum reserve requirement makes holding an account at the central bank necessary. The connection of the payment system to the liquidity providing monetary policy instruments is thus very obvious as is the connection to the central banks role as lender-of-last-resort.

3.2 Competition of Large-Value Payment Systems

All the previous considerations do not rule out, that private providers of an LVPS exist. In such cases a market structure characterised by a duopoly of one private LVPS and the central bank-run LVPS will be the result (Freixas & Holthausen, 2008, p. 445). The explanation for the long-run success of a privately-run LVPS side-by-side with the central bank-run LVPS is in its mutual imperfect substitutability for reasons of risk (i.e. credit risk, liquidity risk, operational risks). The duopoly is then in fact a nice example of monopolistic competition with the privately operated LVPS normally charging lower prices. The above mentioned connections of central bank monetary policy operations and values settled in the central bank operated LVPS have also to be borne in mind when comparing settled values. For the Euro area the TARGET annual report 2017 (ECB, 2018a, p. 13) shows 7% of the payments as central bank operations. Thus the overall effect does not seem to be too large.

Not many examples of duopolies in LVPS markets exist. Table 2 compresses the information from table 1 to a typology of LVPS ownership and management.

Countries	LVPS owner	LVPS manager	Remarks
Argentina, Australia, Belgium, Brazil, China, France, Germany, Indonesia, Italy, Korea, Netherlands, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Turkey, United Kingdom	Central Bank	Central Bank	-
India, Mexico	Central Bank	Central Bank	Central Bank operates more than one LVPS for different purposes
Hong Kong SAR	• Central Bank for	Commercial Bank	Central Bank is joint

	<ul style="list-style-type: none"> own currency LVPS Commercial Bank for foreign currency LVPSs 		owner of the institution which manages the LVPS and owns the foreign currency LVPSs
Russia	<ul style="list-style-type: none"> Central Bank Commercial Bank 	<ul style="list-style-type: none"> Central Bank Commercial Bank 	Central Bank operates more than one LVPS for different purposes Central Bank is joint owner of the institutions which own and manages the remaining LVPS semi-private LVPS has a limited purpose
Switzerland	other (Consortium of Commercial Banks)	Central Bank	-
Canada	Payment Association	Payment Association	-
Euro Area	<ul style="list-style-type: none"> Central Bank Payment Association 	<ul style="list-style-type: none"> Central Bank Payment Association 	-
Japan, USA	<ul style="list-style-type: none"> Central Bank Commercial Bank 	<ul style="list-style-type: none"> Central Bank Commercial Bank 	Japan: private LVPS has a limited purpose USA: Central Bank operates more than one LVPS for different purposes

Table2: Ownership and management of Large-Value Payment Systems in member countries of the Committee for Payments and Market Infrastructures (CPMI); compiled with data from BIS Statistics Explorer, Table PS1: Features of selected payment systems

The BIS Statistics Explorer shows some examples of multiple LVPSs in some countries or currency areas. However, in most of these cases the central bank operates different LVPSs for different purposes such as foreign exchange (FX) or retail payments settlement. Only four cases of some kind of monopolistic competition remain: The Euro area, the United States of America, Japan and Russia. The Russian case is quite peculiar as the (private)³ system NSD has been built for settling the cash leg of securities transactions. Therefore the market share in relation to the central bank operated BESS is structurally small.

³ NSD is part of the MICEX group which has in fact the Bank of Russia as one of their main shareholders.

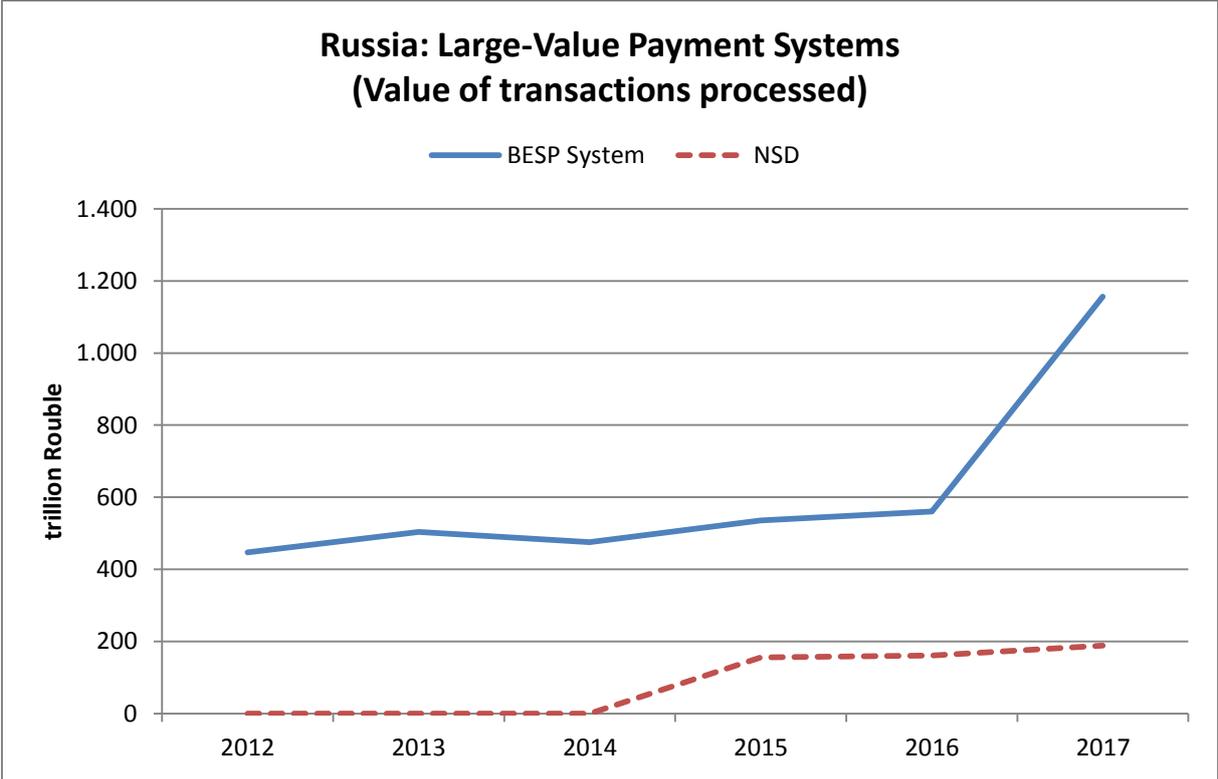


Figure 1: Comparison of turnover in Russian Large-Value Payment Systems; in blue: BESP (operated by the central bank); in red: NSD (operated by MICEX group); data source: BIS Statistics Explorer, Table T9: Value of transactions processed by selected payment systems

Similarly the FXYCS in Japan is only settling the Yen-legs of FX trades and is thus structural-ly much smaller than the BOJ-Net Funds Transfer System run by the central bank.

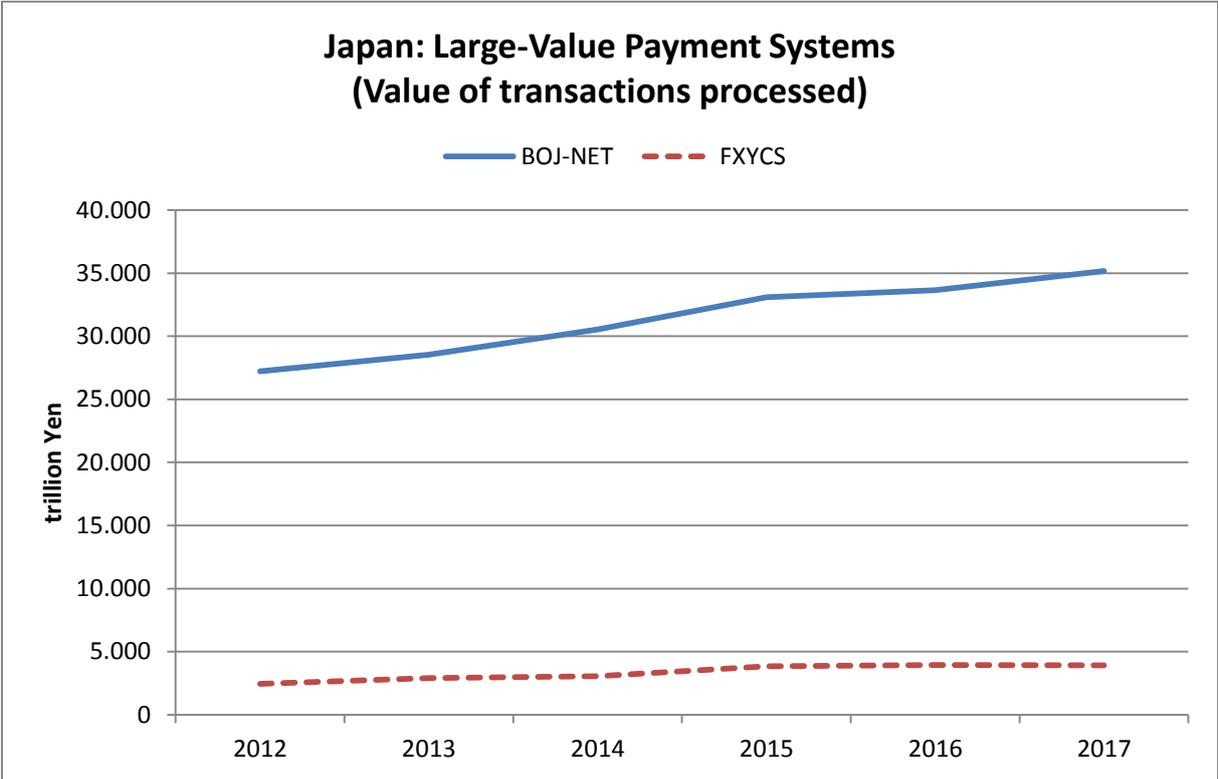


Figure 2: Comparison of turnover in Japanese Large-Value Payment Systems; in blue: BOJ-Net FTS (operated by the Bank of Japan); in red: FXYCS (operated by the Japanese Bankers Association); data source: BIS Statistics Explorer, Table T9: Value of transactions processed by selected payment systems

Data about turnover show, that in the other two cases the central bank operated LVPS settles by far the majority of payments for the reasons discussed above.

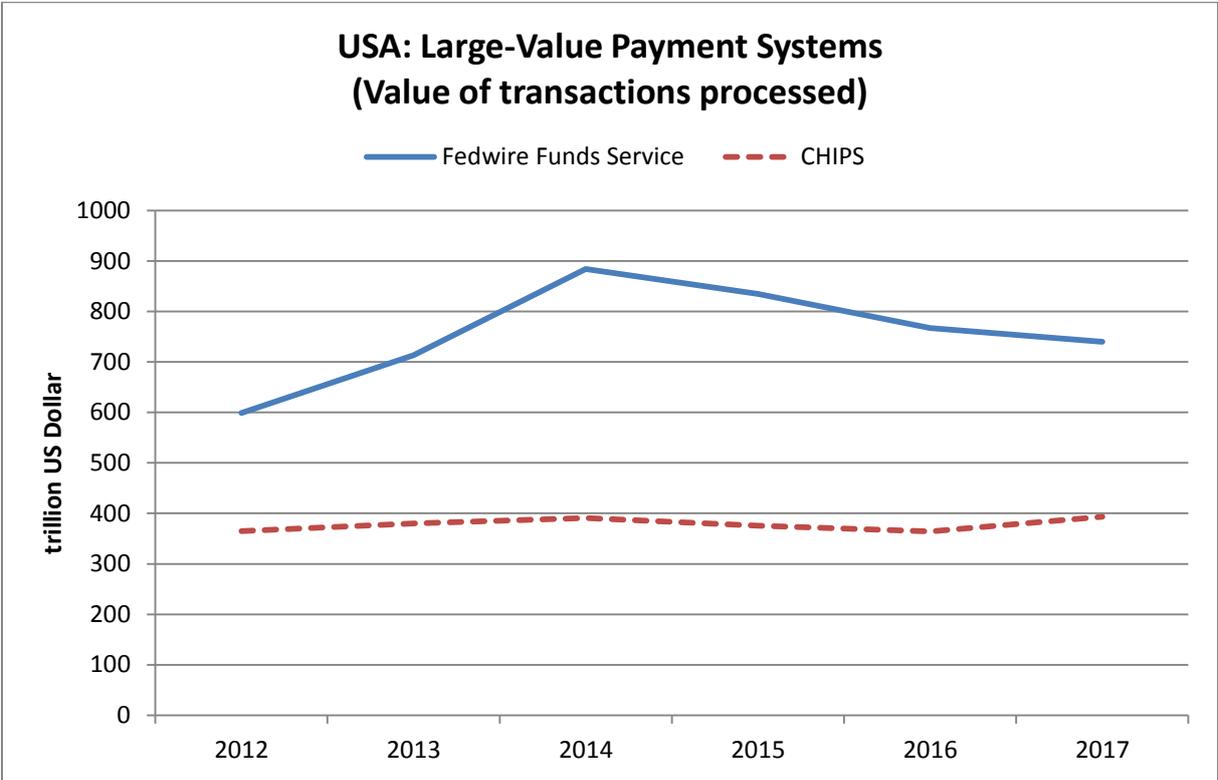


Figure 3: Comparison of turnover in US Large-Value Payment Systems; in blue: Fedwire (operated by the Federal Reserve System); in red: CHIPS (operated by The Clearing House Payment Company LLC); data source: BIS Statistics Explorer, Table T9: Value of transactions processed by selected payment systems

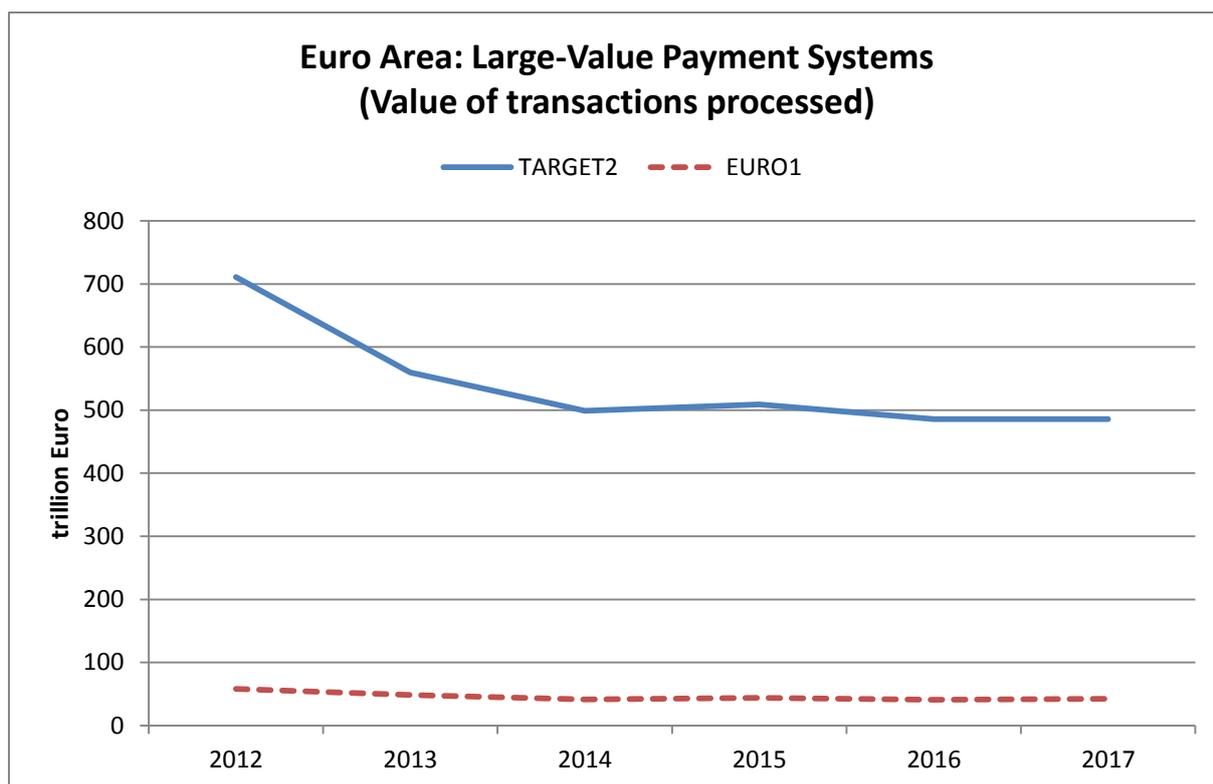


Figure 4: Comparison of turnover in Euro area Large-Value Payment Systems; in blue: TARGET2 (operated by the Eurosystem); in red: EURO1 (operated by EBA Clearing); data source: BIS Statistics Explorer, Table T9: Value of transactions processed by selected payment systems

One additional case should not go unnoticed: In Finland the system POPS still exists but settles only about 2% of the value in comparison to the Finnish legal component of TARGET2 (Bank of Finland, Charts, see references). In terms of market share within the whole Euro area (i.e. compared to TARGET2 and EURO1) the settled values are negligible. POPS is even not classified as systematically important within Finland by the Finnish payment system overseers.

In the first years after the introduction of the Euro, three other national systems which did not become part of the first generation of TARGET operated for a transitional stage. The systems focused on the banks in their respective countries. In Germany there was EAF which was discontinued after the Bundesbank merged its two systems ELS and EAF into a new LVPS called RTGS^{plus} (which became the German TARGET component) in November 2001 (Deutsche Bundesbank, 2000). In Spain SPI was discontinued in December 2004 with the largest part of the settled volume migrating to TARGET (ECB, 2006). The French system PNS operated until 2008 after which two thirds of the traffic went to EURO1 and the remaining third to TARGET2 (Banca d'Italia, 2009, p. 186). The very fact that POPS still survives in Finland is remarkable but in terms of settled volume actually rather unimportant.

3.3 Microeconomic and Governance Aspects of Large-Value Payment Systems

A multiplicity of private LVPSs has so far (apart from the transitory period after the Euro introduction) not been observed and it's also improbable that such a structure is to emerge spontaneously. The reason is twofold: On the one hand, financial market infrastructures do typically show a subadditivity of costs as the development and the running of a LVPS incurs a high volume of fixed costs and only few variable costs. Potentially, increasing returns to scale may add to the cost subadditivity. On the other hand, network effects would lead to a positive externality of using the bigger LVPS so that contesting the market for private LVPSs would only pay off once a critical mass of payments can be processed. This in turn would have detrimental effects for the previously existing LVPS so that a multiplicity of LVPSs would at the best only be a transitory phenomenon. But even contesting these markets could not yet be observed. Only one specific case could be cited as a near-miss. Before the establishment of CLS, a multi-currency payment system that overcomes the settlement risk in foreign exchange markets (i.e. the Herstatt risk), two predecessors as multilateral netting and settlement service called ECHO and Multinet had been established. However, the participation among internationally active banks was far from complete. Indeed the dominant externality was an informational one since committing to one of two standards in the early stages of a market would result in sunk costs. Central Banks of the "Group of Ten countries" thus pressed for a solution that would overcome this waiting for a common industry standard (CPSS, 1996). ECHO and Multinet were consequently merged into CLS in December 1997.

CLS is also insofar interesting as it is one of only few examples of a privately governed LVPS which does not face a direct competitor owned or managed by a central bank. However, the CLS settlement positions would also finally be transferred by means payment in central bank money since no money is left overnight on CLS accounts. Therefore the settlement in CLS is in fact dependent on access to central bank accounts. Two other cases are LVTS in Canada and SIC in Switzerland. The former is owned and operated by the Canadian Payments Association (CPA) while settlement occurs on settlement accounts at the Bank of Canada. The latter is similar in that SIC Ltd is a subsidiary of SIX Group Ltd, which owns 75% of the shares of SIC Ltd. The other 25% of the shares are held by PostFinance. SIX Group Ltd, in turn, is an unlisted public limited company domiciled in Zurich. The company is owned by around 140 national and international financial institutions, who are also the main users of the services provided by SIX. The SIC (i.e. Swiss Interbank Clearing) payment system is operated on behalf of the Swiss National Bank which also acts as a system manager and settlement agent, providing participants with accounts in central bank money and with liquidity facilities. SIC settles large-value payments including those related to the SNB's monetary policy operations (BIS Red Book, 2011 and BIS Statistics Explorer, Table PS 1). Hong Kong may also be mentioned as a case in between. The Hong Kong Interbank Clearing Limited, the system operator of CHATS in Hong Kong, is jointly owned by the Hong Kong Monetary Authority (HKMA) and the Hong Kong Association of Banks. Settlement of HKD payments occurs on accounts held at the HKMA. Thus it can be observed, that the settlement in all three mentioned cases (Canada, Switzerland, Hong Kong) involves the accounts at the re-

spective central banks despite the involvement of private institutions in the governance of the payment system.

4 Governance Aspects in Decentralized Systems of Central Banks

As has been shown in the previous chapter, the creation of central bank money and its usage in the interbank payment system is closely interlinked. Normally this has no further consequences regarding the balance sheet positions in the central bank of a country because the money creation will just lead to an increase of deposits of commercial banks on the liabilities side and simultaneously to an identical increase on the asset side of the central bank's balance sheet (Rule, 2015). However, if the competence for money creation is divided among many central banks in a system of central banks, things become more complicated.

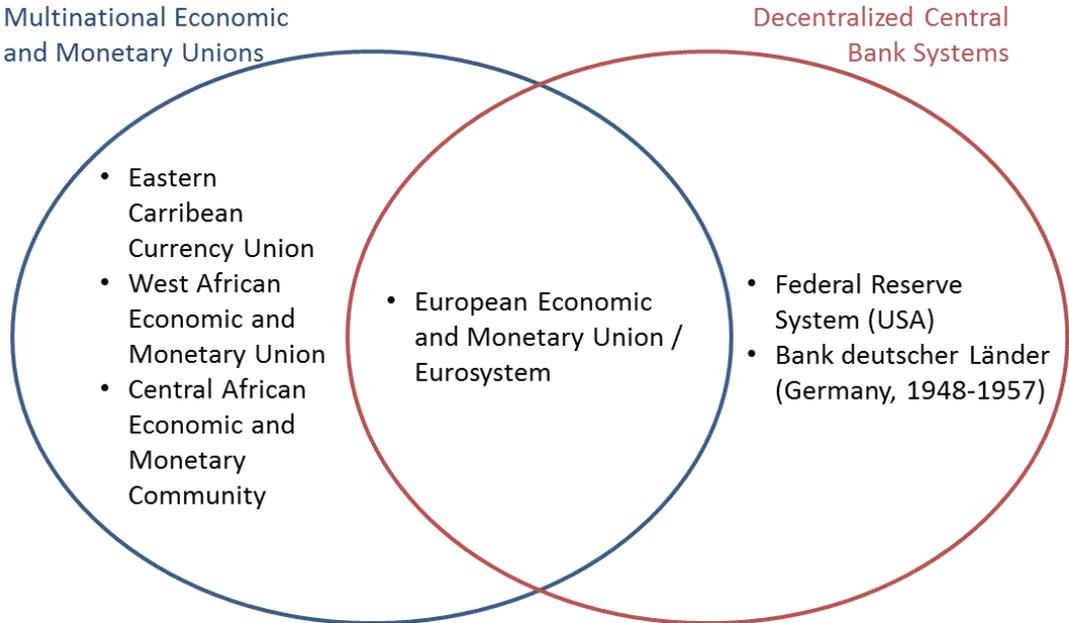


Figure 5: Monetary Unions and Central Bank Systems

Not many examples of decentralized systems of central banks can be found in the real world. While there are currently four multinational currency unions, only the Eurosystem shows such a decentralized structure. In contrast to that, the central banks of the Eastern Caribbean Currency Union (ECCB), of the West African Economic and Monetary Union (BCEAO) and the Central African Economic and Monetary Community (BEAC) are unitary institutions with branches or agencies in their member states. However, these branches and agencies do not possess competencies beyond operational aspects of central banking, i.e. the accounts management is managed centrally. All three multinational central banks pursue a regime of exchange rate stability (a currency board in the Caribbean and a conventional peg in the African Monetary Unions, see IMF 2018) which limits the abilities to create central bank money. A case perhaps could also be made for the central banks of the countries that emerged from the collapsing USSR in the early 1990s and managed the Soviet Rouble separately before

introducing national currencies (Orlowski, 1994, Granville 2016). However, the apparent coordination failures do not make it a good example in the context of a functioning system of central banks. One could even put into question whether this episode could be called a system of central banks at all.

At a national level, the Federal Reserve System of the United States is the only existing case of a decentralized central bank system. A former example would be the predecessor of the Deutsche Bundesbank in Western Germany, i.e. the Bank deutscher Länder with its Landeszentralbanken (State Central Banks) that existed between March 1948 and July 1957. Both cases have in common that the regional central banks were provided with statutory powers (see Section 4 of the Federal Reserve Act and similar provisions for each of the State Central Banks in Western Germany from 1946-1948 see Distel [2002] and the references therein) e.g. maintaining accounts for commercial banks and providing for payment services.

The only example for a decentralized system of central banks in a multinational monetary union is the Eurosystem. Since the structure and the competencies of the different entities in the Eurosystem are very often confused (as in the title of Sinn & Wollmershäuser, 2011 to quote a rather prominent example), it is worthwhile to outline the basics again. The Eurosystem's competence for the definition and the implementation of the monetary policy as well as for the promotion of smoothly operating payment systems is defined in article 127 of the Treaty on the Functioning of the European Union (TFEU). These tasks are reiterated in article 3 of the Protocol No.4 which is annexed to the TFEU and is usually known as the ECB statute. The independence of the ECB and the national central banks (NCBs) is regulated in articles 130 and 132 TFEU and article 7 of the ECB statute. This means that the other institutions of the EU as well as any institution of its member states must not interfere in e.g. rules concerning the monetary policy, the instruments used, the account structures and issues of the payment system. These tasks are to be implemented by either the ECB or the NCBs (article 9.2 ECB statute) and thus by no one else.

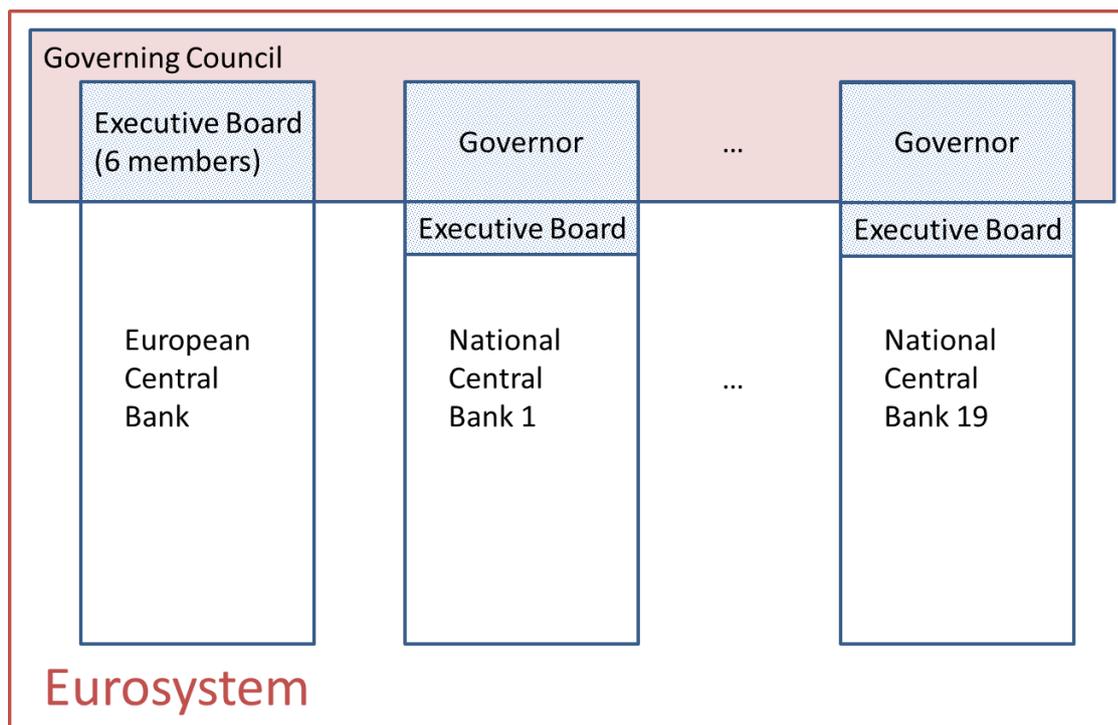


Figure 6: Eurosystem Governance Structures

The ECB together with the NCBs of the EU countries that have adopted the Euro are the Eurosystem (article 282 TFEU). It would therefore be wrong to set the ECB equal to the whole Eurosystem. On the opposite, the ECB is just one of 20 central banks in this system and is as a central bank a Eurosystem member at equal footing to the NCBs. The Eurosystem itself is – in contrast to its members – no legal entity. Therefore it can only act through its members and decisions have to be taken centrally at the ECB governing council, where the NCB governors are represented and enjoy a majority of votes. The ECB governing council is at the same time also the highest decision making body for the ECB itself although such decisions are rarely noticed by the public due to its internal nature. Decisions regarding the monetary policy for the whole Euro area receive of course much more attention. The same article 12.1 of the ECB statute that provides for the centralized decision making does also provide for a decentralized implementation of the operations which form part of the tasks of the Eurosystem.

The rather unobtrusive article 17 of the ECB statute guarantees the ECB and the NCBs the right to open accounts and accept assets as collateral. It is this very legal provision which makes a public sector institution to be a bank. Together with the decentralization principle for the implementation of the monetary policy this article is the key to understanding the legal nature of the intra-Eurosystem claims and liabilities. Among those the so called TARGET2-balances have received most of the attention due to their growth since the beginning of the financial market turbulences in summer 2007 and the great financial crisis one year later. The accounting mechanics have been thoroughly explained in many other papers (e.g. Jobst et al. 2012) so that this does not have to be repeated once over here. However, it is interesting to note that a different article 17 which would grant the right to open accounts for banks and accept collateral exclusively to the ECB would leave the NCBs as empty shells. This

would be comparable to what happened in 1957 in Germany when the Bank deutscher Länder and the State Central Banks were merged into the Bundesbank. The name “Landeszentralbank” was kept for the regional offices of the Bundesbank, but the operational independence of these regional offices was replaced first and foremost by the fact that accounting was centralized. If this was to happen at some later date to the NCBs, the Eurosystem would in fact be synonymous with the ECB. Of course, this is not the case and would also contradict the very ideas of subsidiarity and federalism that – together with the four basic freedoms – can be regarded as keystones of the architecture European Union.

The liquidity provision to banks in the context of the conventional monetary policy instruments as well as the implementation of the Eurosystem’s asset purchase programme (APP) work through crediting the commercial bank’s accounts at the NCBs. The role of the ECB is rather limited as it participates only with a low percentage in the implementation of the APP and does not possess any direct account relationship to the commercial banks. Insofar the ECB is the least of all a bank among the central banks of the Eurosystem and resembles in some ways a coordinating institution such as the Federal Reserve Board is in the Federal Reserve System of the United States. However, any cross-country payments via the Eurosystems TARGET2 payment system would lead to bilateral intra-Eurosystem claims and liabilities that get consolidated at the end of the business day to a multilateral claim or liability towards the ECB through the accounts that the ECB has opened for each NCB. Other than these accounts, the ECB has opened a few accounts for financial market infrastructures without a clear national anchor such as EURO1 or CLS. However, these payment systems are not eligible counterparties in the monetary policy framework and cannot participate in monetary policy operations. The disaggregated financial statement of the Eurosystem available at the ECB’s website reveals this comparatively low level of banking activities of the ECB in comparison to the NCBs: lending to banks is at the ECB always zero whereas money creation through the APP is just shy of 10% of the total Eurosystem volume. In other words: money creation in the Euro area happens largely in a decentralized manner at the NCBs.

The same was true in Germany between 1948 and 1957 with the money creation happening primarily at the State Central Banks. Potentially this is also the case in the Federal Reserve System, although in practice the Federal Reserve Bank of New York enjoys a dominant role in the implementation of the US monetary policy, especially with regards to liquidity creation.

5 Money Creation in a Decentralized System of Central Banks

The primary source of information for anyone who is interested in the amount of central bank money created is the central bank’s balance sheet. In case of a decentralized system of central banks it would be the consolidated financial statement of the whole system, thus not showing any intra-system claims and liabilities. Still the unconsolidated balance sheets of the system member can be quite revealing as to the detailed working of the monetary policy im-

plementation within the system. In the Eurosystem a stylized version of an NCB's balance sheet would look like this⁴:

Assets	National Central Bank	Liabilities
1. Gold and Foreign Reserves		1. Banknotes in circulation
2. Monetary Policy Operations (liquidity-providing), e.g.:		2. Monetary Policy Operations (liquidity-absorbing), e.g.:
<ul style="list-style-type: none"> • Open Market Operations • Marginal Lending Facility 		<ul style="list-style-type: none"> • Bank's Current Accounts
<ul style="list-style-type: none"> • Minimum Reserve Accounts • Deposit Facility 		<ul style="list-style-type: none"> • Minimum Reserve Accounts • Deposit Facility
3. Securities		3. other Liabilities
<ul style="list-style-type: none"> • held for monetary policy purposes 		<ul style="list-style-type: none"> • Government Deposits
<ul style="list-style-type: none"> • other securities 		<ul style="list-style-type: none"> • other (e.g. Deposits from Foreigners)
4. [Government Debt]		4. Revaluation accounts
5. Intra-Eurosystem Claims		5. Intra-Eurosystem Liabilities
<ul style="list-style-type: none"> • Participating interest in the ECB • Claims equivalent to the transfer of foreign reserves to the ECB • Net claims related to the allocation of euro banknotes • Other claims net (i.e. TARGET2) 		<ul style="list-style-type: none"> • Net liabilities related to the allocation of euro banknotes • Other liabilities net (i.e. TARGET2)
6. other Assets		6. Capital and Reserves

Figure 7: Stylized version of a Eurosystem National Central Bank's balance sheet

The colouring is for didactical purposes only. Red denotes the monetary policy with the blue entry of the commercial bank's current accounts as an exception. The banknotes in green are a category by themselves as are the intra-Eurosystem positions in brown. The rest is yellow and encompasses the net financial assets (NFA). Regarding these NFA, the Eurosystem central banks have an agreement called ANFA that restricts the potential money creation by enlarging the NCB's NFA positions. The asset position 4 (government debt) is written in a lighter type since only little remains from the times before the introduction of the Euro (mainly from Italy, Greece and Germany) and its value is quite low with about 0,5% of all assets. Article 123 TFEU forbids any new loans to the government from the Eurosystem.

Liquidity creation in central bank money happens through the monetary policy operations and / or security purchases on the asset side of the balance sheet. Automatically the bank's current accounts will receive this new liquidity. It may be shifted to the minimum reserve account or the deposit facility, it could be changed into banknotes or it could be used for credit transfers to the government or to foreigners. But the liquidity would only disappear when the amount of monetary policy operations was to be reduced or the securities were to be sold on

⁴ Please note that the numbering and the ordering of positions in this stylized version is not the same as in the original version.

a net basis. Increases in the foreign reserves position or other expenses of the central bank would of course also have the same effect.

The intra Eurosystem positions can neither create nor destroy central bank money. Cash would have to be put into circulation before the allocation mechanism for banknotes in the Eurosystem keeps track of asymmetries in cash usage in the Euro area. TARGET2 balances show similar asymmetries in the distribution of central bank money that is available in other liabilities positions of the central bank's balance sheet. A useful metaphor would show two chefs preparing a sauce: one of them is managing the ingredients whereas the other stirs the pot. Both actions are necessary for preparing a good meal and none is inferior to the other. The same can be said about the monetary policy and the operation of smoothly operating payment systems by the Eurosystem.

It should be noted, that the liquidity provision and the submitting and receipt of payments can also involve branches (or subsidiaries) of foreign banks, i.e. banks established outside the country for which the NCB is responsible. This leads to two important observations. On the one hand, changes in TARGET2 balances do not have a direct relationship to other movements in a country's balance of payments. On the other hand, a reduction of the overall volume of TARGET2 balances would be feasible if the branches of a bank with the headoffice in a country with TARGET2 liabilities were to take part in monetary policy operations in those countries with TARGET2 claims. When these branches were to transfer the obtained central bank money to their head offices, the TARGET2 claims and liabilities of the involved NCBs would both decrease, everything else being equal.

It is also interesting to note what needs to happen, when the ECB increases its subscribed capital as it happened in December 2010.⁵ Technically payments through TARGET2 were submitted which reduced the TARGET2-claims and increased the TARGET2-liabilities of all NCBs. On the other hand, each NCB got an increased position "participating interest in the ECB". This shows clearly that payments among members of a central bank system with decentralized responsibilities for money creation lead to changes in the balance sheet position that keeps track of cashless payments. Within a two-tiered fiat money monetary system, a payment from one central bank to another central bank leads to a situation where the payment and the settlement of the payment coincide. The same is also true for payments between the central bank and its account holders, i.e. commercial banks or foreign correspondents.

Therefore, any calls for a settlement of TARGET2 balances are not feasible. It has already happened. Only a payment in any other asset than the central bank money itself would overcome this situation. However, it would be rather absurd if a central bank of issue was to insist on a receiving or sending a payment in anything else than the currency it manages. Only the management of its foreign reserves or the processing of foreign currency payment orders for its customers would lead to obvious exceptions. Other than that, a central bank would face some problems in external communication if trust in its currency by the broader public ever

⁵ In order to smooth the transfer of capital to the ECB, the Governing Council decided that the euro area NCBs should pay their additional capital contributions of €3,489,575,000 in three equal annual instalments. On 29 December 2010 the NCBs paid €1.16 billion Euro as their first instalment. The remaining two instalments were paid at the end of 2011 and 2012. (ECB, 2011, p. 211 + 231)

became a serious issue. Alas, there is no need for settlement of intra-system balances in any other asset than its own currency because even for the members of that system the fact that central bank money is less risky than any alternative asset still holds true for as long as the currency and the central bank onto which the claim is directed (i.e. in the Eurosystem the ECB) exist.

Even the case of the annual exercise regarding the Interdistrict Settlement Accounts (ISA) and the connected rebalancing of the System Open Market Account (for details see Wolman, 2013) would not prove the opposite since the securities are mainly US Federal Bonds. Thus the earnings are interest payments on US Bonds which (after deductions for operating costs and dividends) will finally be received by the US Treasury department which is the issuer of the securities. In effect, the securities serve as a means to implement monetary policy whereas the character of an interest earning asset or even a means of payment between Federal Reserve Banks is clearly subordinated.

Historically, the different positions of the State Central Banks and the Bank deutscher Länder (BdL) in Germany in the post-World War II-period were also “settled” through accounts at the BdL. Insofar the Eurosystem works quite similar.

6 Alternative Solutions for Large-Value Payment Systems in a Multinational Currency Union

If one was to look for an alternative architecture in order to avoid the building-up of intrasystem claims and liabilities within a system of central banks, one would have to start with some basic decisions. First of all the question is, whether to have a decentralized approach for the central bank at all. As has been shown, the money creation on central bank accounts is the crucial point. The Eurosystem is unique among the few multinational monetary unions worldwide and can only be compared to one present and one historical case of decentralized central bank systems within one country. This decentralized approach fits well into the broader institutional and historical background of European unification efforts since the 1950s. Giving up well-established central banks like the Bundesbank with its record of price stability was (and still is) certainly not a feasible solution for a monetary union that was discussed in the late 1980s and throughout the 1990s. The same is true for many other NCBs in the Euro area. As further steps towards a closer political union in the EU are currently not received with overwhelming enthusiasm, one can conclude that the decentralized approach to central banking in the Euro area will stay with us for some longer time. This does not rule out other measures as have been taken with the Single Supervisory Mechanism (SSM) in the framework of the banking union a few years ago. A transfer of the responsibility towards account keeping onto the ECB is discussed by nobody.

As a contrast to a fiat money system with a central bank at its top, a total privatization of the money creation has never been tested in continental Europe. Historical eras of free banking in some countries such as Scotland or the USA have gained attention with new technological possibilities. However, the provision of the public goods monetary stability and financial sta-

bility by entirely private institutions still would have to be tested successfully elsewhere. *“In practice, the unconstrained actions of private sector participants have shown themselves incapable of providing these public goods on a sustained and reliable basis.”* (Haldane & Qvigstad, 2016, p. 628)

Clearinghouses could potentially take over some of the functions that central bank fill out. However, the real test is in crisis times when a lender-of-last-resort could be very necessary. An experiment involving the monetary constitution has proven to be rather unpopular in Switzerland. The same would most probably be true if the citizens of the Euro area were asked whether to abolish central banks altogether.

If a semi-private solution for the supply of LVPS-services was sought for, the effects on the TARGET2 balances would be rather limited in comparison to the present situation. Indeed, history has shown that a concentration of large-value payments on just two systems has occurred. TARGET2 and EURO1 have taken over the entire volume of previously existing LVPS that worked on a national basis. But even if against all odds a small national LVPS survives to the day, as is the case with the Finnish POPS-system, only payments among banks of one nation are settled so that the TARGET2-balance of the Finnish NCB is not affected at all by the existence of the national LVPS. Were private national LVPS in the Eurozone to be spread out at a larger scale over all member countries, the settlement in central bank money would still be necessary so that at the end of the day the TARGET2-positions of the NCBs would not change at all. Even worse in comparison to the present situation would be the effect that national private LVPSs would need an own access to emergency liquidity which would lead to a situation similar to the present discussions about access to central bank money for Central Counterparties (CCPs) after the introduction of the mandatory clearing for over-the-counter derivative financial products.

Any limitation of TARGET2-balances or their future growth (Schlesinger, 2011) would be inappropriate (Ulbrich and Lipponer, 2011) and would have an effect similar to private banks that still retain the right to issue banknotes. While in most countries this is no longer the case, some banks in Scotland and in Northern Ireland issue their own banknotes. As these have to be backed with a deposit at the central bank (i.e. for the United Kingdom the Bank of England) the issuance volume is restricted. Therefore the bank with the least restrictions leads the course, which is on the UK of course the Bank of England. Within a monetary union and a system of central banks such as the Eurosystem, it would be the national central bank with the highest net inflow of payments that determines whether or not to swap “large-value payment facilities” with the other NCBs. Insofar, the Eurosystem would de facto go back to a situation with a dominance of one central bank as was the case during the first European exchange rate mechanism ERM 1979-1998. The costs in terms of financial instability were big as the episode of 1992 when the UK and Italy dropped from ERM clearly shows.

7 Conclusion

TARGET2 shows a certain degree of complexity even for payment system experts. The debate around TARGET2-balances has made the topic even more complicated and even confusing for outsiders. Technical aspects of an LVPS play less a role in the debate. Accounting issues and the connection to macroeconomic issues such as the balance of payments take some time to explain. Yet without a big fan base outside of the small circle of payment experts and central bankers, the current architecture of the accounts structure and the decentralized approach of central banking in the Euro area still have their merits. The discussed alternatives all show major problems that would potentially be much worse than any accumulating TARGET2-balances in the NCBs of the Eurosystem. In the end the basic insight that a claim against a central bank is the least risky asset to be found in our fiat money system still holds true. It does so even for equally ranking central banks within a common system such as the Eurosystem.

The long-lasting discussion about TARGET2-balances gained some momentum when the numbers increased again after the introduction of the asset purchase programme (APP) of the Eurosystem in 2015 and especially when the Bundesbank was just short of reaching a value of 1 billion Euro TARGET-claims against the ECB in 2018. As every argument has been laid on the table multiple times already, I am not inclined to reiterate them again. However, these episodes show that monetary policy and the payment system are very closely interlinked. One simply cannot have the one without the other. These two aspects of central banking are further linked to issues like the stabilization of the financial system after 2008 and during the European sovereign debt crisis. Accountability and transparency of the central bank will certainly help the public to discuss and to understand these matters and will also strengthen the case for an independent central bank in a democratic society.

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