

Technological progress in financial markets infrastructures

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Abstract. During the last years new methods for making payments and new services were being developed. The unprecedented growth in the online commerce has created strong demand for fast and easy to use electronic payment solutions. The key objective of the paper is to analyze the technological progress in the payment, clearing and settlement infrastructures. Particular importance is attached on the euro area payment and securities settlement systems such as EURO1, STEP1 and T2S. Descriptive and comparative approaches are applied in the paper. The result of the study is that the reviewed payment infrastructures provide efficient, secure and cost-effective services to the banks in Europe. They are indicative for the ongoing trends of technical consolidation and integration of the European payment landscape.

Keywords: payment systems, securities settlement systems, technological progress, euro area.

1. Introduction

The launch of the euro as of January 1, 1999 and developments in the technology were the two main factors contributing to the overhaul and reshaping of the infrastructure for effective payments and trading, clearing and settlement of securities. The advent of the euro has also accelerated efforts to harmonize and consolidate payments and securities settlement systems. Nowadays, the market infrastructures are exposed to a wide range of risks. They channel the flow of payments for goods, services and financial assets, and their smooth operation is a crucial prerequisite for the proper functioning of the financial system and the overall economy. Particularly, given their extensive role and the large values and volumes of financial transactions they handle, any malfunctioning of the market infrastructures can have negative repercussions for the implementation of monetary policy and the stability of the financial system. That's why the current paper aims to analyze the key improvements in the euro area financial markets infrastructures that are critical to the smooth functioning of the European financial system. The paper comprises two main sections: Section 1 is focused on the role of payment, clearing and settlement infrastructures and the central bank's oversight function; Section 2 is focused on the most relevant technological innovations in market infrastructures in the euro area. The paper concludes with summarizing the results from the study.

2. Role of payment, clearing and settlement infrastructures

The sound functioning of financial markets infrastructures is of great importance for the overall stability of the financial system in the euro area. The smooth operation of payment, clearing and settlement infrastructures contributes to the implementation of the single European monetary policy. The operational reliability and resilience of these infrastructures and the facilities servicing them are of particular importance in times of stress caused by, for example, turbulent market conditions or strains on liquidity, in order not to exacerbate the situation. This is especially relevant to the global financial and economic crisis from the mid-2007 onwards. In the euro area the financial turmoil was intensified since September 2008 when the volatility of the financial markets was increased. The Eurosystem is responsible for the conduct of the single

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monetary policy and for maintaining price stability in the euro area. It has also a number of other tasks that are aimed at fostering the efficiency and security for all kinds of transfer of funds and securities in Europe.

During the last two decades the importance of payment, clearing and settlement system grew significantly owing to the very rapid growth in the volume and the value of payments on money, foreign exchange and financial markets. Payment systems have become more vulnerable because of their ever-increasing reliance on fast evolving electronic data-processing and telecommunication technologies, as well as their complex, interlinked structure. Innovation and technological progress allow improvements to be made in existing payment arrangements and allow new products, services and processes to be introduced. For example, large-value payment systems (LVPSs) increasingly use offsetting algorithms on a continuous basis and allow online monitoring and management of liquidity and payment flows. New methods of making payments and new services were being introduced, with non-bank parties increasingly becoming involved at various stages of the payment chain. The internet, mobile phones and other portable devices were being developed in order to access payment services electronically on a remote basis. Currently they represent key innovative payment schemes. The exponential growth observed in the online commerce has created strong demand for fast and easy to use electronic payment solutions. Electronic invoicing, electronic reconciliation of payments with invoices, and online account statements all represent innovative services offering great potential in terms of cost savings [3: 166]. In addition to payment instruments, the European Central Bank (ECB) and the national central banks (NCBs) of the euro area also have strong interest in the field of securities clearing and settlement systems. Their responsibility in this field has become even more apparent with the introduction of the euro and the subsequent scale and speed of European financial integration. The robustness and smooth operation of payment, clearing and settlement infrastructures are indispensable for the stability of the currency, the financial system and the economy in general. Technological progress also enables the real-time transmission of data between operational sites located some distance from each other. The increased financial markets integration has enhanced the need for cross-border information-sharing and coordination in the performance of oversight and for the consistency of oversight approaches.

3. Key improvements in payment, clearing and settlement systems

The financial development process is a market-led, as the central bank has a strictly supportive role in this field. The market participants are in a position to develop the underlying strategies, take the relevant investment decisions and assume responsibility for the economic consequences. Technological developments in the markets for payment, clearing and settlement services are aimed to ensure better safety and efficiency, and to allow payments and securities to flow quickly and smoothly throughout the euro area at low cost.

EURO1 and STEP1 systems. The proper functioning of the money market is dependent primarily upon the smooth operation of the cash settlement system. Since 1999 LVPSs have been settled in TARGET, respectively – TARGET2. In addition, most of the payment traffic is also processed by the private net settlement system EURO1 which market share by value and by number of payments processed in LVPSs in euro is increasing. EURO1 is a multilateral LVPS for euro payments. According to the ECB [2: p. 12]: “The most important privately owned and operated EU-wide payment system in the large-value segment is the EURO1 system of the Euro Banking Association (EBA). EURO1 processes both interbank and commercial payments”. The EBA Clearing Company is the operator of EURO1 system. The company was established in June 1998 by 52 EBA clearing banks as a separate entity to operate EURO1 large-value payment system, launched in November 1998 and the STEP1 low-value payment system, launched in November 2001. The EBA is a cooperative undertaking between EU-based banks and EU branches of non-EU credit institutions. It currently has over 65 participating banks from the EU-15 member states and 5 non-EU countries. EURO1 is a system without clear national anchorage. The EBA Clearing Company is incorporated in France and maintains an office in Belgium. EURO1 is established under German law. This lack of national anchorage led the Governing Council of the ECB to allocate the oversight function to the ECB. EURO1 handles credit transfers and direct debits. Payments are processed throughout the day via a settlement account at the ECB. So that the system rests on a highly automated settlement arrangement with the ECB. The processing of the system starts at 7:30 CET. Cut-off time stands presently at 16:00 CET. EURO1 is based on an information messaging infrastructure provided by SWIFT (Fig. 1). The system permits each participant to be identified

by 8 or 11 character SWIFT BIC. Payment messages are processed on an individual basis. Processing includes checking the sending and the receiving participant's position, and if possible, adjusting their position. If the payment is not processed, it is put into an on-hold queue. Upon processing of a payment message, the clearing computer generates a release message to the FIN-Copy service and the original payment message is forwarded to the receiving participant (Fig. 2). The system revisits a participant's on-hold queue each time a payment message in relation to that bank is processed to check whether the adjusted position allows for further processing of payment messages that are held in the participant's on-hold queue. To that effect, the system follows the principle of „by-passing FIFO”. A payment message can be canceled by the sending participant as long as it is not processed. All participants have access to an Interactive Workstation which provides in real time the bank's position, limits and any on-hold payments, certain payment details of payment messages queued in the central system (both send and to be received), balance reports (at reporting time or intraday) and clearing statements (after cut-off time) for processed and held-over payment messages, pre-advice statements providing partial details of individual payment messages for future value, and branch reporting for analyses of payment traffic.

A participating bank must be located in the Organization of Economic Cooperation and Development or the EU, but it needs a branch or subsidiary in the EU through which to access EURO1. All participants in EURO1 must be members of the EBA. They should have own funds of at least €1,250 million and a short-term credit rating of at least P2 attributed by Moody's or A2 attributed by Standard & Poor's, or any other equivalent short-term rating recognized by the EBA. With the aim of smoothing out the payment flows, in 2001 the EBA implemented a new Liquidity Bridge mechanism into the EURO1 system. This mechanism enables participants to distribute liquidity between EURO1 and TARGET2 on an intraday basis, thereby fostering dynamic liquidity management. The liquidity bridge consists of two phases, notably pre-funding (allowing for the shifting of payment capacity from TARGET2 to EURO1 between 7 a.m. and 3.30 p.m. CET) and distribution (allowing for the movement of payment capacity from EURO1 to TARGET2 at 2 p.m. and 3 p.m. CET). The functionality of the Liquidity Bridge has been extended in the last two years by two further distribution windows. ECB declares that the establishment of these two additional liquidity distribution windows would be of benefit from both a EURO1 and a TARGET2 perspective.

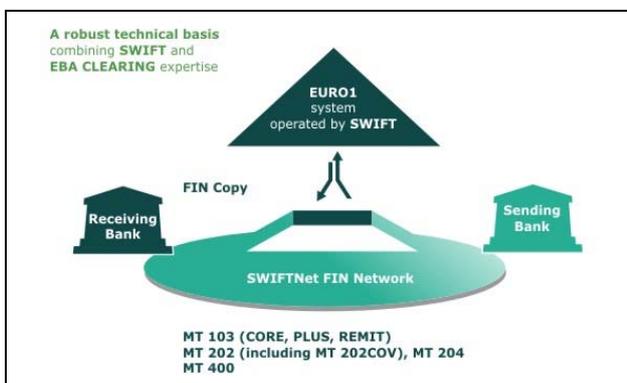


Fig. 1: EURO1 system functionality

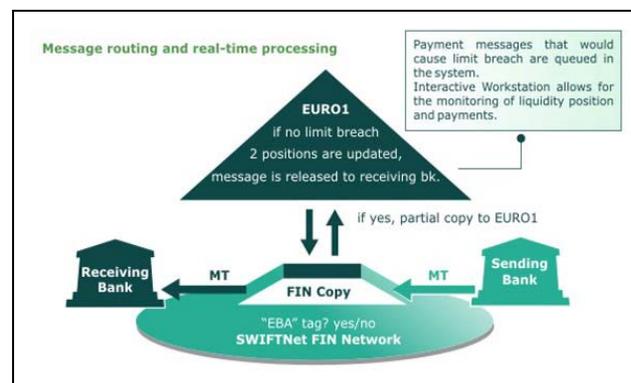


Fig. 2: EURO1 message routing and real-time processing

The STEP1 (Straight Through Euro Payment) system process credit transfers as well as direct debits. Amounts are typically below €50,000 but there is no actual limit. Admission to STEP1 involves neither a minimum credit rating nor a minimum funds requirement. However, the STEP1 applicant must demonstrate, during a fixed period of testing and training that it is technically and operationally capable to work in STEP1. Participation in STEP1 is open to both EURO1 participants and other banks that are not EURO1 participants but use a EURO1 participant as a “settlement bank”. The processing of payment orders in STEP1 starts at 7.30 a.m. CET. The sending cut-off time is fixed at 2 p.m. CET. Payment orders sent after the cut-off time, are rejected. STEP1 uses the existing infrastructure of the EURO1 system. EURO1 and STEP1 provide an efficient, secure and cost-effective infrastructure to the banks in Europe for channeling their commercial and large-value cross-border payments. Both payment systems are based on messaging infrastructure and computing facilities provided by SWIFT. The average daily number of transactions processed by EURO1

and STEP1 amount to over 190,000 for a total value of around €180 billion. EURO1 comprises 66 direct bank participants and 58 indirect participants; STEP1 includes over 116 participants. Since April 2003, EBA has been managing and operating STEP2, a Pan-European ACH-service for mass payments in euro. As of September 2011, STEP2 processed more than 1,676,000 payments with average daily value of euro 6.01 billion [1]. STEP2 counts more than 105 direct participants and more than 1,500 indirect participants. STEP2 In fact, in the field of retail payment systems, the only systems which cover the whole Euro area and which are open to all banks are the EBA STEP1 and STEP2 arrangements.

TARGET2-Securities system. An important technological innovation which is currently in progress is the establishment of the technical platform for settlement of securities transactions in Europe – TARGET2-Securities (T2S). T2S is a major step forward in the delivery of a single European integrated securities market. In July 2008 the Governing Council of the ECB decided to launch the T2S project to overcome the current fragmentation of the European settlement infrastructure. Despite the introduction of the euro in 1999, the provision of post-trading services – clearing and settlement – remained fragmented along national lines. There were 19 CSDs operating in the euro area and almost 40 CSDs in the whole EU. This contrasts significantly with the United States which has highly centralized clearing and settlement infrastructure. T2S is scheduled to go live by 2013. It will be a single IT multi-currency platform for settling all traded securities in Europe, eliminating any differences between the settlement of domestic and cross-border transactions. “T2S will be a state-of-the art settlement engine, providing commoditized and harmonized Delivery-Versus-Payment (DVP) settlement in central bank money in a real-time gross basis. This will extend the most secure settlement method throughout the whole Europe” ECB [4: p. 15]. The main difference between the T2S integrated model and previously used interfaced models is that the T2S will be run by the central bank rather than by the CSD. Instead of outsourcing its cash accounts to be managed by the CSD, in the T2S platform the central bank is in sourcing the CSDs’ securities accounts (Fig. 3). The integrated model of T2S will be operated in conjunction with the Single Shared Platform (SSP) for cash payments of the TARGET2 system.

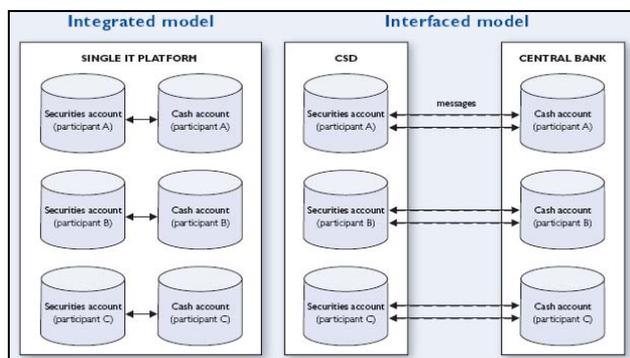


Fig. 3: T2S integrated model

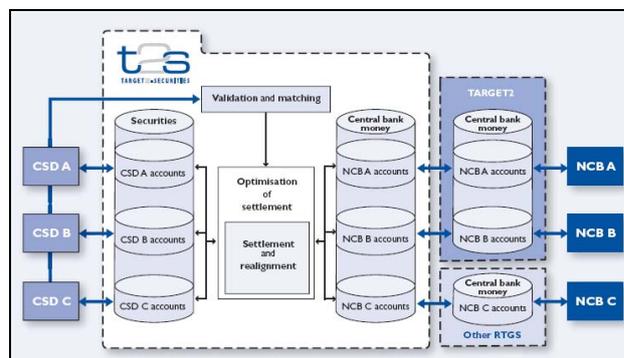


Fig. 4: T2S platform

A simplified overview of T2S is shown on Fig. 4 – T2S (representing the part of the diagram in the white box) will be a single IT platform accommodating both the market participant’s securities accounts, held at either one CSD or at multiple CSDs, and its dedicated central bank cash accounts. T2S will be a service to CSDs, but not a CSD in itself. CSDs will keep all of their clients’ securities positions in T2S, which will map to each CSD’s account structure (including direct holdings), without accommodating all of the ancillary account information maintained by CSDs for their clients. Each securities account held in T2S will be attributable to only one CSD. CSDs which join T2S will be “outsourcing” their settlement processes to T2S, however they will retain all their other functions and relations with their customers, including custody and notary functions. CSDs will still be responsible for opening and closing securities accounts in T2S, for liability vis-à-vis their clients, and so on. The rest of the post-trading value chain, particularly as set servicing, corporate action processing and tax and regulatory reporting, will remain a core function of national CSDs. T2S will maintain dedicated central bank money accounts representing a CSD client’s claims in central bank money on that client’s chosen NCB. Each account may be used only to settle transactions relating to the client’s security accounts in one or more CSDs. This cash account structure will foster efficiency improvements for clients that use more than one CSD. The T2S dedicated cash account(s) will be linked to

the participant's main cash account in TARGET2 or another non-euro NCB real-time gross settlement (RTGS) account. All transfers between the two accounts will be done on a real-time basis. T2S will therefore take the integrated model to a new level, not only directly connecting the securities accounts of one CSD with the cash accounts of one NCB, but connecting any securities account at any participating CSD with any cash account at any participating central bank. All changes in the balances of cash and securities accounts, regardless of which CSD or NCB they belong to, can be made in real time. In this way, cross-border settlement will become identical to (and as inexpensive as) domestic settlement. Another crucial innovation of T2S is its multicurrency dimension. Originally, the idea was for T2S to be restricted on the cash side to the euro and on the securities side to only those held in the euro area CSDs. Nevertheless, the ECOFIN Council explicitly asked that T2S should not be limited to the euro area. T2S will be able to settle almost all securities in Europe. The key benefits of T2S are the following: (i) T2S will bring technical consolidation to the European landscape by providing a single resilient, secure and efficient settlement platform. Thus, T2S will contribute to the development of the single European market of financial services. (ii) It will provide completed harmonized services in the field of settlement instruction management. (iii) T2S will reduce direct processing costs through economies of scale and also through synergies with other Eurosystem services: with TARGET2 in terms of payments in euro and with Correspondent Central Banking Model 2 (CCBM2) in terms of collateral management as part of Eurosystem credit operations. The system have business continuity and contingency models, exploiting the architecture and infrastructure already in place for TARGET2.

4. Conclusion

The development of the landscape for handling of euro-denominated payment and securities transactions follows from the logic of the single currency: all such transactions within the euro area become „domestic”. In the current globalized world, when financial innovation results in new services or products, the markets for payment, clearing and settlement services also become more and more global. However, the increasing interdependencies between systems and between institutions is a source of additional vulnerabilities, allowing disruptions to spread from one system to another and from one market to another. The combination of interdependencies and increased complexity in financial products and infrastructures poses a challenge for central banks seeking to reduce risks in financial system and to maintain the value of, and the public confidence in, their currencies. The reviewed payment systems – EURO1, STEP1 and T2S provide efficient, secure and cost-effective services to the banks in Europe. These systems take advantage of the synergies with other market infrastructures provided by the Eurosystem – TARGET2 and CCBM2. The result of the study is that the reviewed payment, clearing and settlement infrastructures are indicative for the ongoing trends of technical consolidation and integration of the European payment landscape. The technological progress made in the payment instruments, systems and infrastructures reveals the process of further integration of the European financial markets.

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6. References

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