CHAPTER 16

TARGET2-Securities

Europe's New Financial Infrastructure

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1 Introduction

There is something peculiar about economic transactions that has to do with the gap between their agreement and settlement. Signing a contract means the parties enter a mutual obligation to deliver and to pay, respectively. Later, when both delivery and the corresponding payment have taken place, the trade has been "settled." The interval in time and space between agreement and settlement may be large, as when you pay in advance for goods that need to be shipped and even produced – or it may be very small, as when some contemporary financial transactions are settled in "real time" (Riles, 2004; Krarup, 2021). However, in all cases, there's a gap between agreement and settlement that must be handled. What if payment takes place, but delivery fails? Or vice versa? The question is not pure theory. In 1974, due to time differences, a German bank (Herstatt Bank) that had famously engaged in foreign exchange trade ended up declaring bankruptcy after having received Deutsche marks in Frankfurt but before having paid out the corresponding dollar position in New York. The example showed that there was an implicit credit involved in the gap. How do we close the gap between the entering of financial transactions, for example, at a stock exchange, and the actual delivery of assets versus payment of cash among the relevant accounts? Financial infrastructures play a structuring role (cf. Pinzur and Coomb's chapters, this volume), but my analytical and empirical focus offers a perspective that is both broader (money and credit) and narrower (the European Union (EU)) than generally seen in the literature.

In this chapter, I offer an overview of the biggest European financial infrastructure project to date – the TARGET2-Securities (T2S) settlement platform – and situate it in the *longue durée* of money and finance (cf. also Roitman's chapter, this volume). The analysis is motivated by the broader question of how the kind of seemingly fundamental problems of agreement and settlement of economic transactions outlined relate to the historically specific settlement technologies in the EU today. The literatures on money, finance, and financial infrastructures share a broad partitioning among

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scholars who ascribe priority to the historical contingencies of technologies, regulations, and broader social formations on the one hand (e.g., Callon, 1998; MacKenzie, 2006; Muniesa, 2015) and, on the other, those who emphasize the universal nature of money and its problems (e.g., Mehrling, 2010; Ingham, 2016). While thus raising serious difficulties, the question is paramount to our understanding of contemporary financial infrastructures and lurks in the background of most endeavors in this discipline (Petry, 2021; Pinzur, 2021).

Like most other financial infrastructures, T2S remains little known outside the closed circles of the sector and academic specialists. Nevertheless, T2S is a major achievement of its kind, costing some half a billion euros plus the expenses of adapting the existing national systems – private and public. Unusually for this kind of project these days, the settlement platform was created by the European Central Bank (ECB) and implemented between 2015 and 2017. A few years later, by 2020 it settled almost 177 million transactions representing a total value of €173,000,000,000,000 – plus liquidity transfers, probably of a similar order of magnitude (ECB, 2021). As of 2022, T2S connected twenty European countries, with more in view of joining soon (ECB, 2022). T2S thus marks a high point of European financial infrastructure integration.

When the euro was introduced in 1998, there was a need for an integrated *real-time* payments system for the Eurozone (on "real time," see also Riles, 2004). This allowed instant arbitrage among national money markets and hence supported the single monetary policy. It was introduced in 1999 under the name TARGET, which stands for Trans-European Automated Real-time Gross Settlement Express Transfer System (see ECB, 2016). In 2007, a new version was launched, unsurprisingly called TARGET2 (Lucas, 2008). As detailed later in this chapter, with TARGET2, the accounts of the national central banks in the Eurozone were directly connected, meaning that payments could be made cross-border in central bank money and hence as fast and as safe as domestic payments. By contrast, the settlement of financial transactions, involving not only money but also securities (stock or bonds), T2S, was only operable about a decade later (Quaglia, 2010; Porter, 2014). Whereas the need for European central banks to build an infrastructure supporting the common monetary policy was almost self-evident, for long the view prevailed that integration of securities settlement infrastructures should be market-driven, that is, provided by private companies.

T2S is situated in the broader program for single market integration in the EU. A central principle in EU treaty law is the elimination of any "prevention, restriction or distortion of competition" (EUR Lex, 2016, §101). The T2S project – and more broadly the creation of financial infrastructures by EU bodies – must be seen in light of this ideal of free and frictionless competition across borders in the EU. As I have analyzed elsewhere, the T2S project can thus be seen as a response to a general problem in the EU of securing competition understood as a "level playing field" (Krarup, 2019a, 2021, 2022, 2023). Paradoxically, the buttressing of private competition requires harmonized and centralized market infrastructures. This provokes problems about when a service – such as the settlement of transactions – is a commodity to be offered by private companies on a competitive basis, and when it is a necessary infrastructure for the level playing field of the single market that demands strong centralized governance (Krarup, 2019a; Brandl and Dieterich, 2023).

However, at the same time, T2S and other contemporary financial infrastructures appear to reflect older and far more widespread problems of credit and settlement than the context of EU law would suggest. In this chapter, I outline these two ways of understanding T2S. First, there is the historically contingent perspective of European integration. Second, we may adopt a more universal perspective on settlement that emphasizes the fundamental dynamics of money and credit. I ask what the relationship between the two perspectives is and whether they conflict with each other. Specifically,

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I trace the origins and design of the T2S securities settlement platform and use this as a background to address the relationship between the universal and fundamental problems of credit and financial infrastructures, on the one hand, and the specific political and technological context of European market integration on the other. I begin by offering an overview of securities settlement systems (SSS), relating them to general problems of credit and financial infrastructures. I then outline the history of the T2S project, explaining its functioning and construction, showing how T2S relates to the general problems. On this basis, I discuss how the specific technopolitical contingencies of the T2S project, the legal and discursive determinants of EU market integration, and the universal problems of credit and financial infrastructures are related.

2 The Strange World of SSS

When a financial trade takes place, for example, on a stock exchange, that transaction needs to be settled, meaning that the cash must be paid and the financial assets delivered in exchange (cf. Petry's chapter, this volume). Today, both payment and delivery are essentially digital accounting operations. However, despite digitalization, agreeing on a deal and signing a contract remains different from the actual delivery of the purchased asset and corresponding payment in money. Where and how does payment and delivery take place when it comes to contemporary financial products? The question leads us to SSS. These are parallel and complementary to payments systems, often connected to them in order to be able to effect payment and delivery simultaneously. SSS thus provide essential infrastructural services to contemporary financial markets (see also Golka and Swartz's chapters, this volume). The present European standard is for settlement to take place two days after the trade ("T+2"). As I detail in the sections that follow, instantaneous settlement is possible, for example, in the highly advanced domestic bookkeeping systems and on the T2S platform, but the standard deference is often employed because complexity and the number of "custodian" institutions that have to be in concert demand it – especially in the case of cross-border transactions.

The "settlement chain" illustrated in Figure 16.1 is a concept used by professionals to describe the three main steps of trading, clearing, and settlement. What happens in the first step – trading – is generally well known: trading can take place on stock exchanges, bilaterally ("over the counter"), or in open market operations, where central banks buy or sell sovereign bonds to affect the short-term interest rate in markets. Some transactions go from here directly to be settled in "real time." Others (especially those from stock exchanges) pass by a "clearinghouse" that accumulates the multilateral positions of each participant throughout a period of time (such as a day), netting in- and outflows before settlement. Clearinghouses allow participants to save liquidity and plan their financial flows (see also Riles, 2004; Millo et al., 2005). Finally, in settlement the

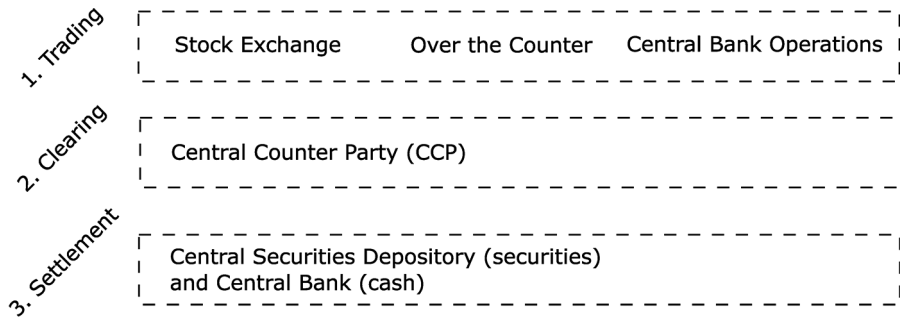

Figure 16.1 The settlement chain.
Source: Author

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actual exchange of money and securities takes place on the accounts of the counterparties (traders). Often, such final settlement takes place in the central bank for cash and in so-called central securities depositories (CSDs) for securities. Like clearinghouses, CSDs are regulated as infrastructures, meaning that they can have little exposure in the market.

Settlement is thus removed from what we usually imply when talking about financial markets (trading floors, stock exchanges, banks, monetary operations), in terms of regulation, institutions, and time. It is therefore important to remember that, when we begin to discuss credit, money creation, and securities later in this chapter, one should not draw too hasty conclusions from the insights gained in the domain of infrastructures back to financial markets. Nevertheless, there are important analytical and conceptual insights to be gained from this which I will discuss in the sections that follow.

3 The Payment Infrastructures of International Finance

Instruments of credit are virtually as old as the available written records, and so basic operations of financial infrastructures, such as clearing and settlement of credit instruments, have a very long history. In ancient Babylonia and Egypt, credit instruments were used for collecting taxes and governing the seasonality of agriculture (Davies, 2010). In the twelfth century, the great fairs in the Champagne region connecting Northern and Southern European industries involved extensive use of agents, partnerships, and professional freighters and couriers, forming a system "based entirely upon credit" with net clearing and settlement (*pagamentum*, "making peaceful") at the end (Face, 1958). In the nineteenth century, London bankers organized the multilateral clearing of checks as follows. When a client of a bank made a payment by check, the receiver would take that check to his bank, which in turn would have to get the money from the payer's bank. To facilitate this process, every day the London banks would send delivery boys with checks they received to the Bankers' Clearing House where, by the end of the day, the net position of each participant (between cash receivable and cash payable) was calculated (Babbage, 1963 [1832]). As for today, Perry Mehrling has shown how the basic principles of finance remain highly stable across widely different financial instruments and that there are striking parallels between the fundamental logics of nineteenth century and contemporary finance, including such modern creations as "shadow banking" (Mehrling, 2010; Mehrling et al., 2015).

In all of these cases, the instruments of credit and finance are closely connected to the infrastructures designed to safely and efficiently generate, trade, transfer, and settle them. In fact, I would claim it is impossible to separate money and credit from financial infrastructures because money and credit are themselves such financial infrastructures, at least in part. This claim diverges from the definition of money by its "functions" found in contemporary economics textbooks (but dating back to Aristotle's *Nicomachean Ethics* vol. 5): a *store of value* ("a way to transfer purchasing power from the present to the future"); a *unit of account* ("the terms in which prices are quoted and debts are recorded"); and a *medium of exchange* ("what we use to buy goods and services") (Mankiw, 2012, p. 82). The standard definition dislodges from view the deep and indeed foundational contradictions immanent to the concept of money. The paradox becomes more evident by saying that money is, simultaneously and often conflictually, commodity and credit (Krarup, 2021).

To the extent that money has historically been a material commodity, such as cattle or gold (a view advanced by economists such as Menger (1892) but historically misleading according to Davies (2010)), money was created when that commodity was created (e.g., when gold was mined). Pure commodity money would be highly inefficient because market participants have to earn before they can pay. A merchant who wants to sell goods at a high profit in a distant market needs credit to pay for the goods now in the home market collateralized with the expected future return

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on the trading. However, when banks extend credit, they do not take material commodity money (such as gold) from their vaults and hand it over. Today, money is created when banks make loans – that is, money is simultaneously commodity and credit (Bank of England, 2014). The bank does not take the money from somewhere else and give it to the borrower. Instead, it simply enters the deposit on the debtor's account corresponding to the loan obligation. Using simple T-balance sheet notation for economic entities (individuals, firms, or other) with assets (what the entity owns or has a right to) on the left side, and liabilities (what the entity owes to others or to its owners) on the right, money creation can be illustrated, as in Figure 16.2.

Both the balance sheet of the bank and of the borrower thus expands with lending. Indeed, the credit goes both ways in the sense that the bank has just promised to pay out the deposit *on demand*, while the borrower has promised to pay back the loan (plus interest) within a specified period. The bank makes money from the loan on fees and on the interest rate gap between loan and deposit, while the borrower may make money from being able to invest (i.e., to buy before they sell).

In this way, credit supports the division of labor in society, with the bank specialized in credit rating and in credit risk management, and borrowers exploiting their capacities more fully by being able to invest in their market of expertise, as well as to ride out unforeseen liquidity fluctuations. Borrowers rarely cash out more than small change, but the bank will need a reserve to be able to make payments on behalf of the borrower to counterparties using other banks. In Europe today, such interbank payments pass through the national central bank (via the "reserve deposits" that the private banks, in turn, hold there). This is illustrated in Figure 16.3. Of course, the central bank can grant credit (reserve deposits) to banks in the same way as in Figure 16.2 – and does so almost automatically against legible collateral, especially government bonds, opening up the whole question of state–market relations, which I shall leave aside here (Gabor and Ban, 2016; Krarup, 2019b).

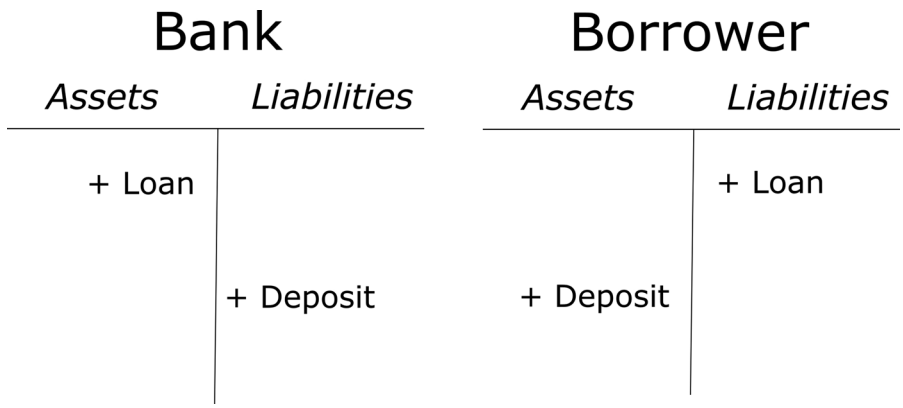

Figure 16.2 Money creation through lending.
Source: Author's elaboration.

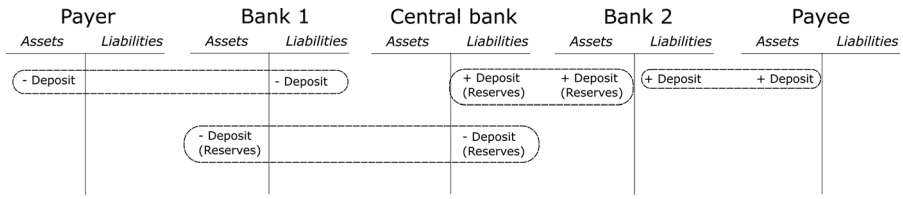

Figure 16.3 Payment example.
Source: Author's elaboration.

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The T2S is essentially a system of interconnecting national central banks to form a pan-European system where payments are ultimately settled in central bank money. Because central banks don't involve the same risk of bankruptcy and default on payments as private banks do, payment in central bank money is considered safer and more efficient.

The banking sector can thus be conceptualized as a bookkeeping system. But at the same time, the banking system creates money on a competitive basis by making loans. In this way, banking is *both* a market and a market infrastructure. Indeed, we have a paradox – a conceptual contradiction: money is both a system of bilateral credit relations and the universal medium in which exchange takes place. It is both market and market infrastructure.

Bookkeeping money ideally requires a fully integrated, but also centralized and hierarchical, system where central bank money has a "higher quality" than commercial bank money (Mehrling, 2013). First, the central bank cannot go bankrupt because what it owes to the commercial banks is its own liabilities and these it can create at will (however, it can go bankrupt if it cannot pay other central banks what it owes them, creating an international hierarchy with the US Federal Reserve Bank at the apex). Second, the fact that the liabilities of all other banks in the system are "promises to pay in central bank money" means that the credit of different banks take on the *exact same* value – at least in "normal times," when a crisis does not threaten to make a specific bank illiquid. Today, we take this for granted, but historically and logically there is no reason why this has to be so. In a horizontal system of binary relations ("free banking") the value of the liabilities of each bank would be different. In the "wildcat" years of largely unregulated US banking without a central bank, geographical distance between banks and varying quality of the banks issuing not only deposits but also their own dollar banknotes meant that banknote brokers – like foreign exchange brokers today – exchanging "foreign" notes for local ones could charge discounts of sometimes more than 40% (Dillistin, 1949; see also Haveman, 2015).

3.1 Money and Credit on the T2S Platform

We are now in a position to appreciate how the money side of T2S – payments – functions and how it relates to historical problems of financial infrastructures. T2S, which is connected to TARGET2, runs both deferred net settlement and real-time settlement. One challenge with real-time settlement is the coordination of liquidity flows – does the payer have enough money in their settlement account so as to not deadlock the flow of transactions? In order to avoid participants holding large liquidity buffers in the settlement system, T2S has a function called "auto-collateralization" whereby payees are automatically credited with the cash they need to settle transactions in real time. Auto-collateralization can be either "on stock," using securities that the payee has available in the system, or "on flow," using the very incoming securities that the credit is used to buy. The latter option may strike the reader as almost magical at first. However, the logic is in fact similar to that of a mortgage – and to many other forms of collateralized credit – where the real estate purchased serves as collateral for the very credit used to finance the purchase.

As illustrated in Figure 16.4, in auto-collateralization everything happens at once as a simple bookkeeping operation: the cash never actually goes to the buyer's account, but goes directly to that of the seller. The buyer has opened a free-of-charge intraday credit with the central bank that they will have to pay back before the end of the day. The historical overview and the introduction to balance sheet analysis should make clear that auto-collateralization is "just" a sophisticated implementation of basic principles of money and finance. T2S thus manifests the virtually infinitely flexible and fully integrated role of credit-commodity money as a market infrastructure (Krarup, 2021).

The takeaway message in this section is, firstly, that by offering a highly integrated

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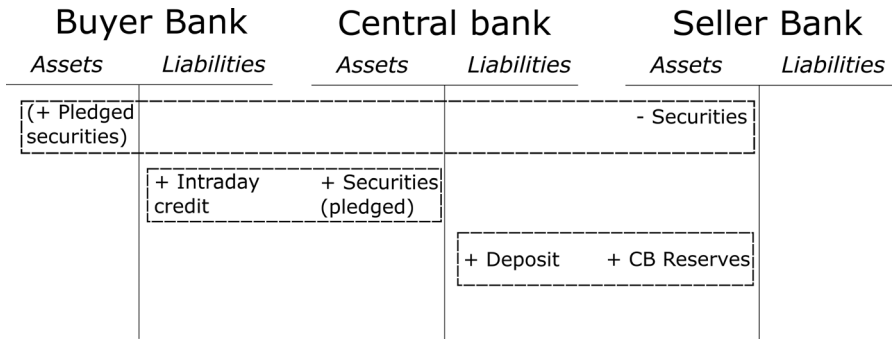

Figure 16.4 Auto-collateralization on the T2S platform.
Source: Author's elaboration.

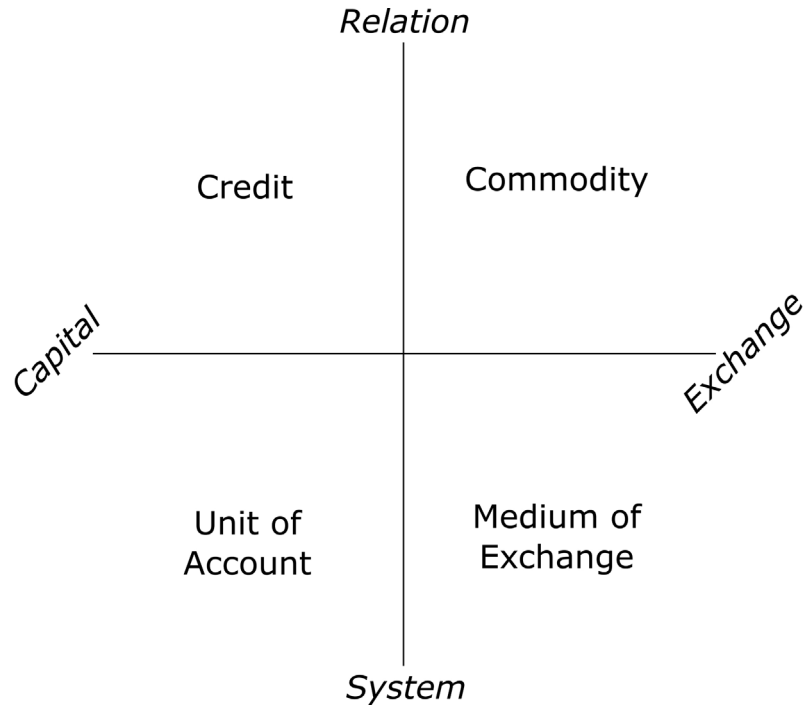

Figure 16.5 Money as credit and commodity.
Source: Author's elaboration.

and efficient settlement system at the apex of the "hierarchy of money" (Mehrling, 2013) in Europe, T2S offers a favorable situation for the participating financial institutions. Both real-time and deferred net settlements are possible; however, the distinction between the two becomes blurred due to the affinity of automatic settlement credit and clearing. Indeed, the temporal gap between trade and settlement can be conceived as a kind of outstanding credit where the checks received by the payees are still only *promises* to pay (the payer's bank may default on it, or even go bankrupt in the meantime), which introduces the complexity of risk and capital into the seemingly trivial settlement process and blurs its separation from the market (Millo et al., 2005; see also Riles, 2011). Second, we should appreciate that banks are inextricably both market players (granting credit on a competitive basis) and market infrastructures (operating payments). Finally, as a public settlement infrastructure, T2S cannot be decoupled from credit creation, even if the credit is not

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money, officially (Millo et al., 2005; Krarup, 2019b, 2021). All in all, the attempt at separating settlement from markets through the creation of infrastructures like T2S does not escape the double nature of money and credit.

Figure 16.5 summarizes the analysis of money and the problems that the paradox of money poses for clearing and settlement. As a contractual relationship between market agents, money is either credit (capital, "producing" rent or interest) or a commodity (used in exchange). But at the same time, money is a system or infrastructure. As the generalized commodity for payment, money is the "medium of exchange," whereas as the generalized measure of credits it is the "unit of account." As we have seen, these "functions" do not simply add up, but produce distinct problems – which the TARGET systems can be seen as attempts to handle at the European level.

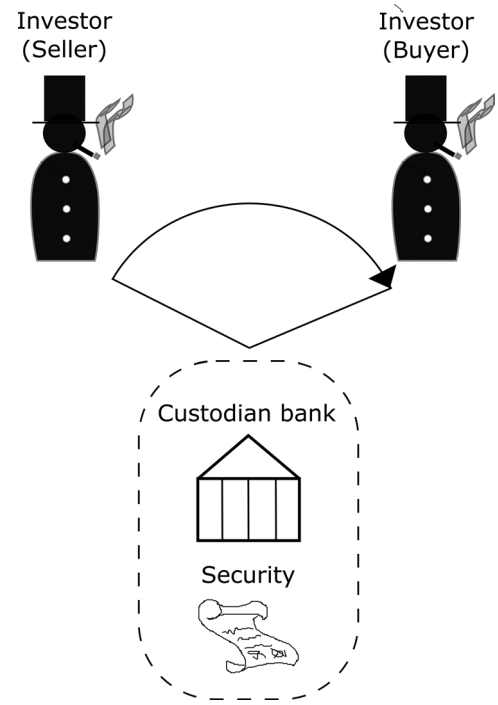

Figure 16.6 Custody (immobilization) of securities.
Source: Author's elaboration.

4 Securities and Custody across Borders

I now turn to the securities side of settlement, having dealt with the liquidity side. Historically, when stocks and bonds were material sheets of paper held by the owner, it could take much longer than the present European standard of two days (T+2) to settle a securities transaction, not least due to the need for physical transportation. Professional "custodian" banks are generally used to take care of the practical aspect of settlement. In the case where the transacting parties are clients with the same custodian bank, the sheets of paper do not need to move at all – perhaps not even to a different box in its vaults – but can simply be ascribed to another account (Norman, 2007, p. 11). This is the principle of *immobilization* of securities: if all transacting parties – directly or indirectly through other banks – had deposited their securities in accounts with the same custodian, then settlement would in principle be simple bookkeeping, as illustrated in Figure 16.6. In addition to *immobilization*, over the years the dramatic increases in the computational power of information technology allowed for the complete *dematerialization* of securities, which would no longer be issued in physical form, but only as numbers in electronic accounts – as pure bookkeeping (ECB, 2007c, p. 7). Physical existence and movement of paper was thus eliminated altogether.

However, custody is also a competitive business and the differences between national jurisdictions, technical standards and systems, language, and even culture means that many banks only provide custody services within their domestic context, or only across a few countries in a particular region. But even the biggest and most specialized custodian banks can get into trouble. For example, with financial internationalization growing rapidly, the apex of the global financial system in New York experienced a severe *paperwork crisis* in 1968 (Norman, 2007; Wolkoff and Werner, 2010). Executing a single transaction involved some thirty different documents with hundreds of messengers – which one trader describes as "low paid, incompetent and seemingly non-English speaking" (quoted

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in Norman, 2007, p. 21) – traveling around Wall Street (Wolkoff and Werner, 2010). Stock exchanges reduced opening hours and even closed on Wednesdays to give back-offices time to unload, yet they were unsuccessful in preventing settlement and delivery failures, with losses reaching some 4 billion dollars and about 160 broker-dealers closing, merging, or filing for bankruptcy (Wolkoff and Werner, 2010). Other important overload crises in international settlement infrastructures include Euroclear's electronic jam around 1978. Indeed, the exponential growth from a literally nonexistent international bond market in 1965 to $18 billion outstanding by 2006 (BIS figures reported by Norman, 2007, p. 34) could not have taken place without continuous development and integration of financial infrastructures.

In New York, the paperwork crisis eventually led to the establishment of a CSD, owned by the stock exchange and the securities dealers, where all domestic securities could be immobilized and transferred by book entry (Norman, 2007, p. 41). The CSD would only occupy itself with the actual settlement – all the services related to trading, issuing, and holding securities – such as credit provision, dividend payments, cross-border settlement, and underwriting – would still be the domain of commercial banks. Some European countries already had CSDs (Norman, 2007, p. 39), but, like their US counterpart, they were not linked across borders. The continuous rise in cross-border financial activity, therefore, also provoked important developments in "global custody." Major US banks like Chase Manhattan, State Street, and the Bank of New York pioneered this business by offering their clients "a single access point to national CSDs through a network of intermediaries" (Norman, 2007, p. 86). One of the major US custodian banks, JP Morgan, set up a so-called international CSD, or ICSD, in Brussels. The ICSD later became Euroclear and was sold off to its users – primarily international custodian banks, such as BNP Paribas and Société Générale. Together with its main competitor Clearstream – set up in Luxembourg a few years later by a consortium of European banks (ECB, 2007c, p. 10) – Euroclear played an important role in the events that led to the T2S project about three decades later, as we shall see.

Many CSDs were initially set up in close collaboration with – and sometimes based on strong pressure from – central banks to allow settlement in central bank money. For example, in France, a CSD for government bonds was created by the central bank (later merging with the CSD of the stock exchange), and in Denmark a CSD with cutting-edge technology was set up by the financial sector, pushed by the central bank. Now, delivery of securities in the CSD and payment of cash in the central bank could take place simultaneously to eliminate any risk that the one would settle without the other. The technique became known as *delivery versus payment* or DvP, first introduced in the 1980s. Nevertheless, even if national CSDs are directly linked (which they are in some cases) or if banks hold securities in one of the ICSDs, they will need a custodian bank to handle all the legal and technical aspects of custody.

As depicted in Figure 16.7, the landscape of cross-border settlement in Europe thus remained complex even after the euro was implemented, compared to the streamlined domestic systems. This meant that cross-border settlement was substantially more expensive, less efficient, and less safe than domestic settlement (Giovannini Group, 2001). Contrary to domestic settlement, cross-border settlement is not always in DvP mode, nor does it use central bank money. Even settlement between the two ICSDs, Euroclear and Clearstream, could be complicated before they relaxed mutual animosities and established efficient accounting relations with each other (Norman, 2007).

In the words of economists, post trade is highly concentrated because it is a *network* industry: the more clients you have, the more you can settle internally, and the cheaper it can therefore be done. The global custodian will seek to constantly optimize liquidity across the different countries and systems in which it is active – avoiding surplus in one country and deficit in another (at a penalty

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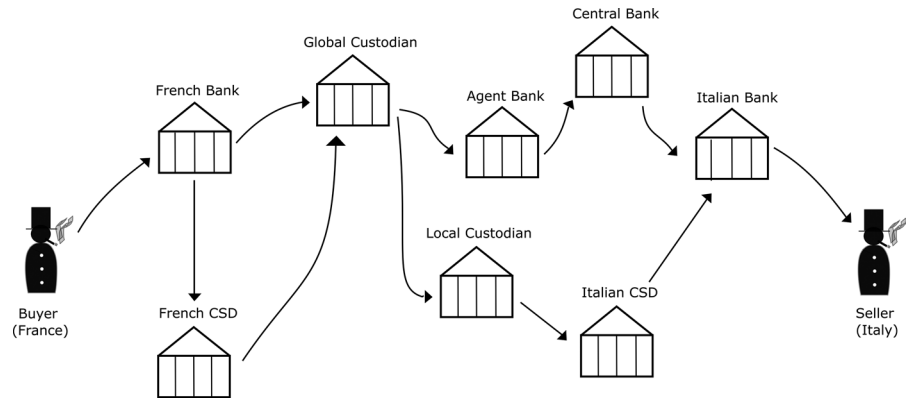

Figure 16.7 Cross-border settlement in Europe before T2S.
Source: Author's elaboration.

overdraft rate of interest). Custody is also a *fixed cost* industry with large economies of scale: if a custodian bank settles between two countries, it needs experts to deal with the differences in things like legislation. But once a system is in place, it is comparatively inexpensive to treat 1,000 transactions instead of 100. What the sterile language of utility and costs neglect is that these features are rooted in deeper structures of clearing and settlement which are simultaneously characterized by a problem of *fragmentation* and a logic of *centralization* (Krarup, 2019a).

5 Toward T2S

Already the Treaty of Rome (1957, Article 3.c) had established the objective of "the abolition, as between Member States, of the obstacles to the free movement of [goods], persons, services and capital." The free movement of capital attracted increasing political efforts from the mid-1980s on (Grossman, 2012, p. 195). But for capital to move – as we have seen – post-trade infrastructures need to be in place. Discussions on clearing and settlement of securities in Europe dates back at least to the late 1970s, but change was slow until the introduction of the euro made progress more urgent.

Around 2000, there was widespread optimism about the integration of securities settlement infrastructures making leaps toward integration. An Action Plan (European Commission, 1999) was adopted, followed up by the Markets in Financial Instruments Directive (MiFID) in 2004, which effectively harmonized securities trading (but not settlement) across Europe and thereby created competition between stock exchanges, leading to a wave of mergers and acquisitions in the field (Haan, Oosterloo, and Schoenmaker, 2015, pp. 90–94). Two reports commissioned by the European Commission estimated that the cost of settlement of cross-border securities transactions in Europe was about eleven times higher than domestic settlement and defined a strategy for private and public action to remove "barriers" by 2006 (Giovannini Group, 2001, 2003). Looking back on a process that would eventually take another ten to fifteen years, the challenges and complexities were clearly underestimated.

Indeed, there was no sign of anything like the ECB-led T2S project around 2000 because financial infrastructure integration was seen as a private-sector responsibility. Market-driven integration, supported by legal harmonization, was widely believed to be within reach (Norman, 2007, p. 103) and more in line with the principles of an open-market economy with free competition enshrined in the treaties and in the Statute of the ECB and of the Eurosystem of central banks (EU, 2012, Art. 2; see also Giovannini Group, 2001; Lamfalussy Committee, 2001; European Commission, 2004). As late as 2006, Commissioner McCreevy stated that "an industry-led solution is the best outcome

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for improving the efficiency of clearing and settlement in the EU" (McCreevy, 2006, p. 4).

However, we have seen how money and credit require integrated and indeed centralized institutional structures in place. Economists speak of network externalities and economies of scale pushing for strong centralization and possibly even a natural monopoly because the biggest firm will have a competitive advantage and drive out all its competitors. Once the monopoly is established, however, the firm will have "monopoly power" and therefore be able to charge a higher price and make a "monopoly profit." Indeed, the national CSDs were monopolies, including the US CSD, which served as a reference in the Giovannini reports.

Economists claim that without competition the pressure for innovation will be lost – disregarding (as economists so often do) the historical fact that many CSDs were originally public or created on the background of strong central bank demand (Van Cayseele and Mededinging, 2004, p. 3; Serifsoy and Weiß, 2007, p. 3038). So they advocated for "contestable quasi monopolies" for European settlement (Van Cayseele and Mededinging, 2004; see also Rochet, 2006; Kemppainen, 2007; Milne, 2007a, 2007b; Serifsoy and Weiß, 2007). According to these authors, such regulation would mitigate barriers raised by: (1) firm-to-firm hostilities, such as the missing link between Euroclear and Clearstream or (2) by exclusive technical standards, such as in most integrated domestic systems where the CSD, stock exchange, and central bank formed a close-knit whole – "silos" where you have to either buy the whole package or not be connected at all.

The strategy of contestable quasi-monopolies, supported by legal and technical harmonization, was essentially the vision adopted by the Commission in the early 2000s. Indeed, a number of mergers took place. The Scandinavian CSDs attempted to merge in the late 1990s, and there were proposals of merging the French and the German CSDs, but they failed (Norman, 2007, pp. 141–149). The big question was what would happen with the two ICSDs, Euroclear and Clearstream. The German CSD and Clearstream merged in 1999, owned by Deutsche Börse. Shortly after, Euroclear acquired the French, Dutch, and Belgian CSDs with the explicit ambition to create a "single shared platform" for the three countries in close corporation with their common stock exchange, Euronext – the so-called ESES (Euroclear Settlement for Euronext Securities) platform. This was "the first attempt to establish a truly cross-border marketplace for securities" (Panourgias, 2015, p. 3).

Euroclear's idea was to integrate not only settlement, but also the other elements of

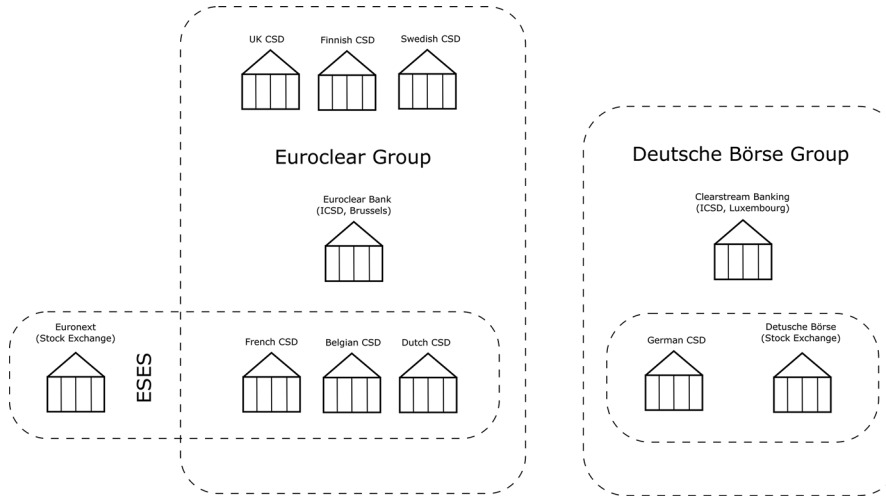

Figure 16.8 Euroclear and Clearstream groups.
Source: Author's elaboration.

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the CSD business – notably issuing securities and servicing the various events that occur during the "life" of a security, such as coupon and dividend payments, tax claims, splitting, and so on – all summarized under the term "corporate actions." With this project well underway, Euroclear continued acquiring further CSDs – the UK (2002) and the Finnish and Swedish (2008) (Euroclear Bank, 2024). Euroclear was moving toward a successful first step in its overall ambition for a "single settlement engine" for all its CSDs (see Panourgias, 2015). The result of the principal mergers is depicted in Figure 16.8.

But the wave of mergers soon died out again. Clearstream did not pursue expansion any further. The Euroclear project was unprecedented, but stagnated due to a growing list of difficulties and, it seems, lack of support from local market players and regulators.

6 The T2S Project: Resigning from the Market to Save the Market

Then, in 2006, the ECB decided to force a new way ahead (for details on this turning point, see Krarup, 2019a, 2021). The ECB announced that it was "evaluating opportunities to provide settlement services for securities transactions" by setting up a new service "which may be called TARGET2-Securities" (ECB, 2006). Following a feasibility study (ECB, 2007a) and a public consultation (ECB, 2007b), the T2S project was launched by the Governing Council of the ECB on July 17, 2008 (ECB, 2008). In the press release, the ECB stated that "T2S constitutes a major step forward in the delivery of a single integrated securities market for financial services … T2S will provide a single, borderless pool of pan-European securities, as well as a core, neutral, state-of-the-art settlement process" (ECB, 2008).

The ECB essentially set out to create a single securities settlement platform not only for the Eurozone, but for the whole of the EU, owned and operated by the Eurosystem (composed of the ECB and the national central banks). However, there was now an appreciation that the vision faced a long path ahead and that considerable work of legal harmonization would be required (McCreevy, 2007). Elsewhere, I have analyzed the series of controversies that played out before T2S was in fact implemented from 2015 onwards, including the difficult legal harmonization (Krarup, 2019a). Here, I simply note that the apparent U-turn in strategy from private to public initiative seems to have been made possible not simply by the fact that settlement is a natural monopoly, but more profoundly by the paradoxical nature of money and credit instruments as, simultaneously, market and infrastructure.

The simple principle of T2S is to bring all securities accounts from the national CSDs onto the same pan-European settlement platform where transactions can be settled in DvP mode and in central bank money via a connection to the T2S. This is illustrated in Figure 16.9. A bank will thus have a cash account with its central bank, which in turn is connected to the whole Eurosystem of central banks via TARGET2, and a securities account with its CSD, which in turn is similarly connected with the whole Eurozone via T2S. The idea is that, in this way, the Eurosystem-operated T2S platform will provide cheap, safe, and efficient settlement in DvP mode and central bank money for the whole Eurozone.

According to the ECB's online introduction to T2S, the platform has the following benefits:

- making it easier for investors to buy securities in other EU countries
- reducing the cost of cross-border securities settlement
- increasing competition among providers of post-trade services (i.e. clearing and settlement services) in Europe
- pooling collateral and liquidity, meaning that banks no longer need to keep these in various locations and can quickly move them to where they are needed
- reducing settlement risk and increasing financial stability by using central bank money for transactions on the platform. (ECB, 2022)

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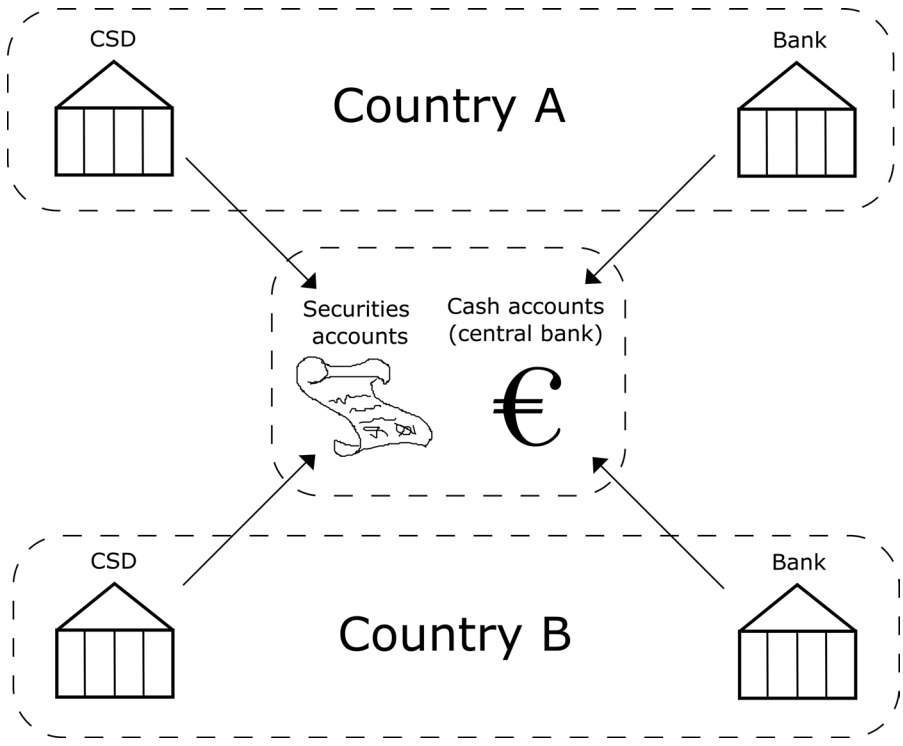

Figure 16.9 T2S: A pan-European settlement platform.
Source: Krarup (2019a), Taylor & Francis Ltd, http://www.tandfonline.com/; see also ECB (2024, p. 21).

In brief, T2S connects all the CSDs of the participating countries and hence offers an integrated DvP system for cross-border settlement using central bank money. Financial institutions holding securities accounts in a national CSD can hold a dedicated cash account on T2S to settle transactions on the platform. Moreover, T2S offers optimization tools such as auto-collateralization and other algorithms, which are particularly interesting to large institutions. It is even possible for direct participants to make instructions directly in T2S, circumventing their CSD and central bank. T2S connects twenty-one CSDs from twenty European countries, including one non-euro country, Denmark, with the option to settle in the Danish krone (ECB, 2022).

Following the 2008 financial crisis, it was realized that T2S had the additional benefit of unlocking securities held passively in different countries as buffers (collateral) by international financial institutions through pooling and optimizing the "liquidity" of collateral (Krarup, 2019b). Moreover, T2S was later acknowledged to constitute an important prerequisite for the Commission's new plans for the next steps in financial market integration, such as the Capital Markets Union and various new regulations (European Commission, 2015).

7 Concluding Discussion: A European or a Universal Problem?

Theoretically, T2S confronts us with a dilemma. On the one hand, we have seen how the paradoxes of credit are age-old and, in that light, the T2S project appears almost natural. On the other hand, we have seen how T2S constituted a break with the dominant strategy for financial market integration in Europe around 2006, and that the road from conception to implementation was long and difficult. How do we square the quasi-universality of the logic of credit and settlement with the contingencies of the EU? The question is obviously fundamental and hence very difficult to answer. However,

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even raising it and offering some initial observations about it affords a contribution to contemporary social studies of finance.

T2S is more than the robinsonade of a new technology. It responds to, literally it seems, universal problems of credit and settlement, as well as to the telos of market integration enshrined in EU treaty law, understood as the removal of all barriers to free competition (Krarup, 2022). Perhaps the relationship between the two mechanisms is that markets have been made central to the European integration project via treaty law since the Treaty of Rome (1957). Indeed, it is not obvious that the paradox of money as market and as infrastructure, respectively, should become a central problem of European governance, except for the fact that it has become a cornerstone of European integration via the objectives of removal of barriers to competition and trade. Paradoxically, the removal of such barriers became the motivation and legitimation of the T2S project, although it at least resembles a public monopoly (Krarup, 2019a).

In this account, the pursuit of market integration understood negatively as the removal of barriers to competition runs into paradoxes about what that "market" is, raising questions about the provision of adequate (harmonized, centralized, efficient) market *infrastructures*, notably of clearing and settlement. For example, we have seen how clearing and settlement cannot be isolated from credit and hence some sort of money creation.

In my previous work on T2S (Krarup, 2019a, 2019b, 2021, 2022), I have emphasized the distinctively European side of these problems. However, more work is needed to settle the question of the relationship between the specifically European and the broader, ancient problems of money and credit between market and market infrastructure. For now, based on the analysis given, I propose what I call the "amplification thesis": that the inscription of a distinctly competitive conception of the market in core treaty texts amplifies the problems of credit and settlement and market infrastructures in European integration policy.

T2S was not a predetermined fate of the Treaty of Rome. Besides all the contingencies of history and politics, the problems inscribed at the core of the European project of defining "the market" and delimiting it from "market infrastructures" and from "government" means that new responses to the paradox of money must be developed and replace old ones when these break down. T2S was such a new response in a contingent situation and has, so far, been a largely successful one. However, the fundamental conceptual problems are far from settled.

For example, I do not think that the problem of government is simply imposed upon the paradoxes of credit and financial infrastructures by European treaty law. I call it the "amplification thesis" and not the

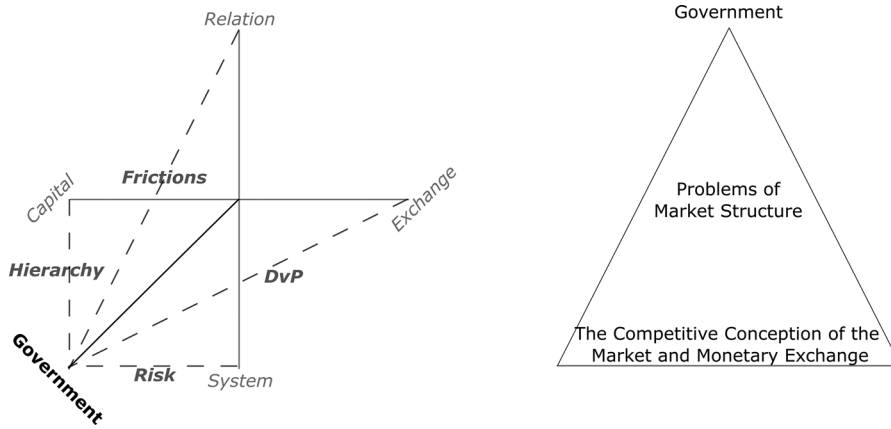

Figure 16.10 Government in the competitive conception of the market.
Source: Author's elaboration.

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"imposition thesis" because the problem of governance emerges from within those paradoxes, but are amplified in Europe, it seems, because afforded a central legal and political position. In this perspective, T2S represents a technopolitical response to ancient problems or paradoxes of credit and settlement – the most recent response in a long lineage of responses and probably not a final solution to the problems (Krarup, 2021). Returning to Figure 16.5, we may thus add a third dimension – that of governance or government (public or private in the sense of centralized power of organization), as in Figure 16.10.

Government emerges from four types of problems in the original plane: (1) problems of "frictions" in the *relations* of exchange and capital circulation; (2) problems of "delivery versus payment" in *exchange*, such as default risk or technical barriers to transactions; (3) problems of "risk" in the system of exchange (market) and capital (economy), such as the risk of liquidity and credit "freezing up" (Krarup, 2019b); and (4) problems "hierarchy" with credit as capital. I have not developed the fourth point here, but I'm referring to the "hierarchy of money" (Mehrling, 2013) and the way it leaves different types of institutions with different sources of rent in a hierarchical structure of credit and payment infrastructure institutions, as we have seen – rather than establishing a "level playing field" for all.

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