

Hurdles to Take for T2S



A study conducted by

Consileon Business Consultancy

Maximilianstraße 5

76133 Karlsruhe

Germany

Authors: Micha Sigloch, Eleonora Borisova

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1 Purpose of this Study

Since 2006, Consileon's Capital Markets unit has been closely following the progress of the Target2-Securities (T2S) initiative of the European Central Bank (ECB). However, the increasing amount of inquiries from our clients has motivated us to conduct this study. We aimed to develop an independent view on the topic based on publicly available information.

It should be noted that this study reflects the personal view of the authors, and has not been sponsored or influenced by any of our clients. We consider it as an independent and neutral contribution to the ongoing discussion among financial industry experts, and we are happy to receive feedback from our readers via the following email address.

Contact: T2S@consileon.com

2 Abstract

T2S is the European Central Bank's proposal to central securities depositories (CSDs) to outsource settlement onto a common IT platform operated by the central banks of France, Germany, Spain and Italy. T2S would rationalize cross-border transactions between Europe's CSDs, turning the Giovannini Group's idea of interoperability into reality.¹ After more than three years of consultation with market participants, T2S implementation began in summer 2010.

A legally binding framework agreement between the ECB and partaking CSDs is to be signed in April 2011. T2S is scheduled to be available to the first group of CSD participants by September 2014. The project poses complex legal issues as it is a rare example of private enterprise outsourcing business processes to a public-sector institution. Despite the progress the project has made, our study identifies six major issues that remain to be solved for T2S to achieve its objectives.

¹ On the concept of interoperability, see section 6 of this study.

3 Executive Summary

Key findings from this study:

- T2S requires a long-term investment of several hundred million euros from the ECB and partaking CSDs. No solid proof has been presented yet that this investment will significantly boost cross-border business, which currently accounts for less than half a percent of all settlement transactions of European CSDs, and thus lower the cost of settlement within Europe.
- We estimate that even if T2S were to only cover a subset of financial instruments, it would take until 2022 at least to accomplish full interoperability between the 30 CSDs that have signed the memorandum of understanding with the ECB.
- This study has identified six hurdles which T2S must clear to gain the acceptance it needs to succeed on the market.

Those six hurdles are the following.

1. **Hurdle 1: Clarify a blurred vision.** Establish a business case for interoperability. Explain why interconnecting 30 CSDs under the T2S model will lead to a cost structure almost as lean as that of a monopolist such as the US-based DTCC. Even if European CSDs were consolidated into a single securities depository, settlement and custody would still be separated, with the ECB offering the former, and a pan-European CSD providing asset services. What is more likely, though, is that market consolidation will result in a small number of CSDs operating across Europe alongside the ECB infrastructure.
2. **Hurdle 2: Re-focus on the mission.** There is no business case to be argued in favour of routing domestic settlement via T2S. T2S is supposed to reduce cross-border transaction costs. Holding out the hope that incorporating domestic transactions may result in substantial cost savings is too vague. In fact, shifting domestic stock exchange and OTC settlement onto T2S will extend the implementation timeline without benefitting the cross-border business. Only after getting the cross-border solution up and running should the ECB move on to integrate domestic business.
3. **Hurdle 3: Argue the case for cost savings.** The ECB and the CSDs need to step up their joint efforts to explain cost-savings to investors. As T2S will only succeed if accepted by the investor community, T2S and the CSDs must cooperate closely in communicating a coherent business case or price reduction strategy.
4. **Hurdle 4: Manage harmonization.** To reduce cross-border transaction costs, the ECB must push harder for harmonization of both the settlement to be

supported by T2S and the asset servicing processes to be supported by the CSDs. Based on the agreements reached with the stakeholders of the project, the ECB should use its political influence to speed up national and supranational harmonization efforts.

5. **Hurdle 5: Agree on a common governance structure** covering the entire T2S project from release planning, specification and development to live operation and change management.
6. **Hurdle 6: Pursue phased approach to reduce complexity and risks.** Apply 80-20 rule to first release. Cooperate with CSDs to speed up T2S readiness through measures such as reduction of instrument scope or using ISO 15022 as the standard for connecting to the T2S platform.

T2S will also impact intermediaries such as local and global custodians. In this market segment (depositories), we anticipate the following development:

- Global custodians are interested in disintermediation and doing business in Europe via a single point of entry such as a regional custodian or large CSD.
- Large CSDs will move up the value chain and compete with regional custodians. Both will offer their services to global custodians.
- Regional custodians are likely to acquire smaller CSDs to offer central bank money settlement via T2S.
- Smaller CSDs will cooperate or merge to achieve economies of scale.
- Local custodians will help large CSDs to provide asset services and build up local expertise.

4 Introduction

Over the past ten years, industry experts have come up with four scenarios designed to increase the efficiency of European cross-border securities settlement.



Figure 1: Proposals to increase efficiency of cross-border settlement

Proposals 2, 3 and 4 have materialized into real projects, which are currently being pursued in parallel. Given that 30 European CSDs have signed a memorandum of understanding (MoU) on Target2-Securities with the ECB, T2S would serve the largest number of countries and thus has been at the centre of the market's attention.

According to the T2S brochure published on the ECB website, T2S will make cross-border settlement identical to domestic settlement in terms of cost, risk and technical processing.² However, market participants will only start benefitting once the CSDs that signed the MoU have got their interoperability layer up and running, as illustrated in figure 2. This study focuses on what it takes for CSDs to get there.

² ECB, "Settling Without Borders", November 2009, page 7.

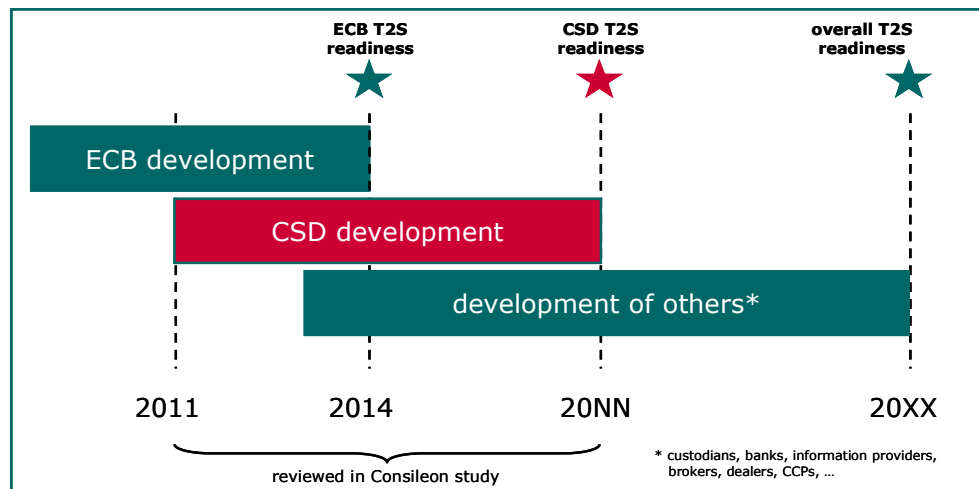


Figure 2: Readiness of the CSD layer

5 Blurred Vision

One of the key findings of the Giovannini Group's study of cross-border efficiency from 2001 is that settlement costs are up to ten times higher between EU member countries than within the United States of America. But rather than suggesting a monopolistic, possibly non-profit organization for Europe (see section 3, figure 1), the group argues that interoperability of CSDs would result in a level of cost-efficiency on par with the US, as it would induce competition and remove any excess CSD capacity from the European market. T2S follows the Giovannini Group's recommendation to a large extent, but is neglecting to analyse the technical and operational infrastructure it presupposes.

We believe that even if market practice and settlement methods were harmonized throughout Europe, systems and operations designed to process the complete spectrum of financial instruments will always be cheaper for a single organization to maintain than for multiple players. As closely as the 30 CSDs may interoperate in the future, they will hardly match the cost advantage of a monopolist.

According to the assumption of the Giovannini Group, competition brought about by T2S could consolidate the European CSD landscape along the following fictitious timeline:

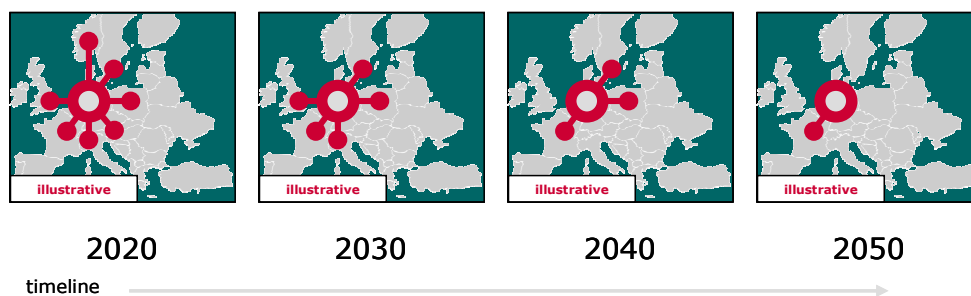


Figure 3: Giovannini Group's vision of competition and consolidation among European CSDs

As it seems unlikely that CSDs should lose the issuance monopolies they have on the national level, consolidation on the CSD layer will be confined to the industry's IT and operational infrastructure (similar to the Euroclear approach, figure 1, scenario 3). Experience from Euroclear's pioneering project suggests that this consolidation will be a lengthy undertaking. In fact, it took the company almost ten years to finish ESES, a project launched to centralize securities processing for customers in Belgium, France and the Netherlands onto a single IT platform.

Hurdle 1: Clarify a blurred vision. Establish a business case for interoperability. Explain why interconnecting 30 CSDs under the T2S model will lead to a cost structure almost as lean as that of a monopolist such as US-based DTCC. Even if European CSDs were consolidated into a single securities depository, settlement and custody would still be separated, with the ECB offering the former, and a pan-European CSD providing asset services. What is more likely, though, is that market consolidation will result in a small number of CSDs operating across Europe alongside the ECB infrastructure.

6 Cross-Border Essentials

Current cross-border securities settlement procedures are governed by the following, fairly simple rules.

- Two CSDs are involved.
- The leading settlement system, i.e. the one of the CSD through which the securities have been issued (known as issuer CSD), determines the finality of the transaction. Its counterpart is called investor CSD.
- Besides mirroring the bookings of the issuer CSD in its depository system, the investor CSD holds and services the foreign securities deposited in its accounts.

Fictitious example: a customer of Monte Titoli (MT), the Italian CSD, wants to purchase Eurotunnel bonds and has agreed with the seller, a client of Euroclear

France (EFr), that both counterparties enter a delivery versus payment (DvP) transaction via their respective local CSD. In this case, EFr is the issuer CSD, and MT is the investor CSD. As the two are interoperable, they exchange settlement messages to finalize the transaction, which is confirmed by EFr.

Two days after settlement, Eurotunnel announces a corporate action in the form of an income event. However, instead of distributing cash as the proceed of the event, it grants free train rides. To make this benefit available to its customer, MT needs operational and technical resources that might not be necessary to handle income events for Italian securities.

In short, the investor CSD must be able to process and service foreign securities as well as domestic assets. T2S proposes a standardized interface and processing rules for a European settlement engine. However, the responsibility for providing adequate asset services on foreign securities remains with each CSD. T2S streamlines settlement between CSDs, but fails to unify subsequent asset servicing processes and national market practices, assuming that the latter will ensue once the former has been accomplished. We think that, unless driven by the ECB, pressure to resolve harmonization issues in asset servicing and beyond will be insufficient (see section 11).

7 More CSDs, More Complexity

In the context of this study, interoperability refers to the capacity of two CSDs to settle securities transactions between themselves in either direction (will be solved by T2S), and to provide asset services on the securities exchanged, which may require further interaction (will be solved by the CSDs). In a fictitious example of only three European CSDs (let's say France, Germany and Italy), interoperability would require the following linkage.

	investor France	investor Germany	investor Italy
issuer France		CSD link required	CSD link required
issuer Germany	CSD link required		CSD link required
issuer Italy	CSD link required	CSD link required	

Figure 4: Linkage requirements for CSD interoperability

A CSD link is the respective technical and operational abilities of one CSD to transfer securities to another, and the ability of the receiving CSD to perform asset servicing on the securities received. A bilateral CSD link is the capability of two CSDs to operate a CSD link in both directions.

Full interoperability (bilateral CSD links established) between three CSDs requires $3 \times (3-1) = 6$ CSD links. Given that 30 CSDs have signed the MoU, T2S would need an infrastructure of 870 (30×29) CSD links to achieve full interoperability between all participating CSDs.

8 Status Quo

Appendix A shows the links established so far between the 30 CSDs participating in T2S. In October 2010, their total number was 65. None of those 65 CSD links covers the entire spectrum of financial instruments (all ISINs, bonds, equities). Even if that were the case, interoperability between the 30 CSDs would accommodate only around 7.5 percent of the linkage requirement calculated in the previous section (65 divided by 870).

Appendix B provides an overview on current settlement volumes across the 30 CSDs, totalling some 330 million transactions per year. We estimate that a maximum of three million cross-border transactions a year is settled via existing CSD links.³ Due to double entry in both the issuer and the investor CSD's ledgers, this actually represents only 1,500,000 securities transfers. In other words: current cross-border transactions between the 30 CSDs engaged in T2S account for less than half a percent of total European settlement volumes.

9 Future of Domestic Settlement

After its launch in 2014, T2S is expected to settle 269 million transactions per year,⁴ covering more than 80 percent of the 30 CSDs' current volume. That raises the question of why domestic settlement, whose pricing has always been competitive to DTCC's,⁵ should be integrated into T2S, marked up with an ECB fee, and still remain on the same market price level as before.

³ Extrapolation of figures presented by Link Up Markets at the European Clearing & Settlement (ECS) conference in London on 1 July 2010.

⁴ T2S General Technical Specification, November 2009, page 7.

⁵ See appendix C.

The ECB argues that this is possible due to savings effected by the local CSDs through outsourcing their settlement infrastructure to T2S. Some CSDs, however, object to this reasoning, as those systems have completed depreciation years ago, and have been customized and integrated to support specific processing needs not covered by T2S such as asset servicing, registration, and vaults management. Furthermore, T2S entails a considerable multi-year investment.

Whereas it would make little sense for CSDs to decommission their settlement infrastructure, there might be a desire from the ECB to recover its accrued project costs as soon as possible by charging a fee of 15 cents per transaction, and thus ask for integration of domestic volumes into T2S. From our point of view, such a strategy will extend the timeline for CSD readiness, and in addition bears the risk that existing settlement transaction costs get more expensive for end investors, if the premium charged by the ECB is passed onwards to CSD customers by CSDs.

Alternatively, we suggest first establishing cross-border interoperability, then migrating domestic settlement step by step onto the T2S platform, provided that its sponsors succeed in proving that the availability of a pan-European platform significantly increases the number of cross-border transactions, and meets the needs of market participants in general (proof of concept).

In addition, this approach would reduce operational risks related to the introduction of T2S in September 2014. It has been pointed out by several CSDs that due to the short implementation timeframe, there is a high risk that the CSD operations of major European markets are paralysed through T2S processing failures or through unavailability of the T2S service. CSDs as low risk takers are reluctant to take on any additional risk resulting from technical or operational failure at the T2S platform.

Hurdle 2: Re-focus on the mission. There is no business case to be argued in favour of routing domestic settlement via T2S. T2S is supposed to reduce cross-border transaction costs. Holding out the hope that incorporating domestic transactions may result in substantial cost savings is too vague. In fact, shifting domestic stock exchange and OTC settlement onto T2S will extend the implementation timeline without benefitting the cross-border business. Only after getting the cross-border solution up and running should the ECB move on to integrate domestic business.

10 Future of Cross-Border Settlement

A key point of the Giovannini study is that cross-border settlement is significantly more expensive than settlement within a country. It is based on the number of intermediaries along the cross-border value chain (dark boxes in the figure below).

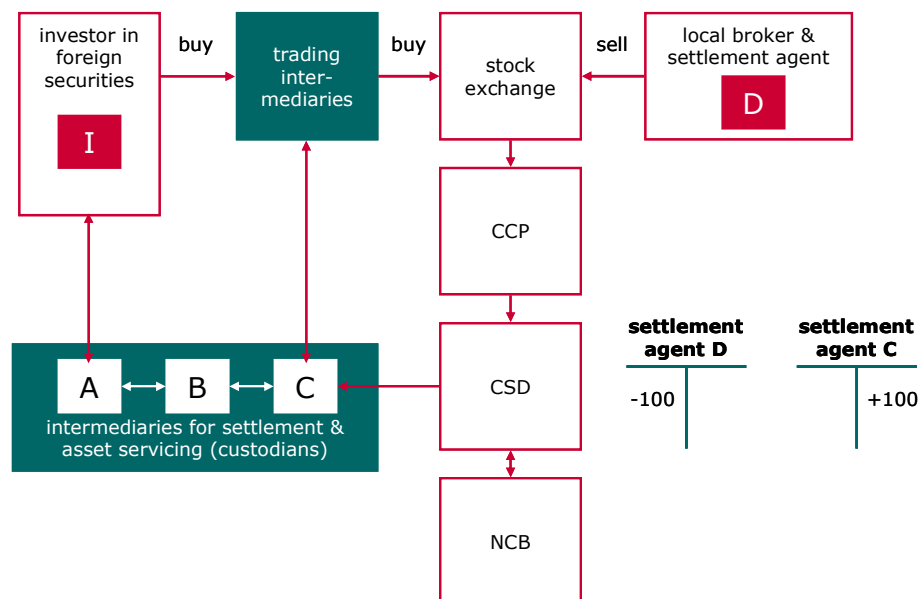


Figure 5: Cross-border transaction based on Giovannini's as-is scenario (simplified)⁶

In figure 5, an investor who participates neither in the local stock exchange nor in the local CSD purchases 100 foreign shares. To complete the transaction, three custodians (A, B, C) need to interact. Settlement is reported to the investor by his local custodian A.

To the CSD, this is a plain domestic settlement transaction, in which 100 shares are transferred from settlement agent D to agent C. Costs charged to the investor on top of the domestic settlement fee are incurred through intermediation. How could T2S, or CSD interoperability, optimize this scenario?

Figure 6 exemplifies a future cross-border transaction between fully interoperable CSDs under T2S, in which the investor minimizes intermediation by becoming directly a member of its domestic CSD.⁷

⁶ Based on Michael Chlistalla, Peter Gomber, Torsten Schaper: The Future of the European Post-Trading System. Goethe University, Frankfurt, Germany, December 2009.

⁷ We assume in this scenario, that intermediation has been eliminated on the trading side, too, and the investor becomes a direct participant in the foreign stock exchange. This is, however, neither in the scope of T2S nor a subject of our study.

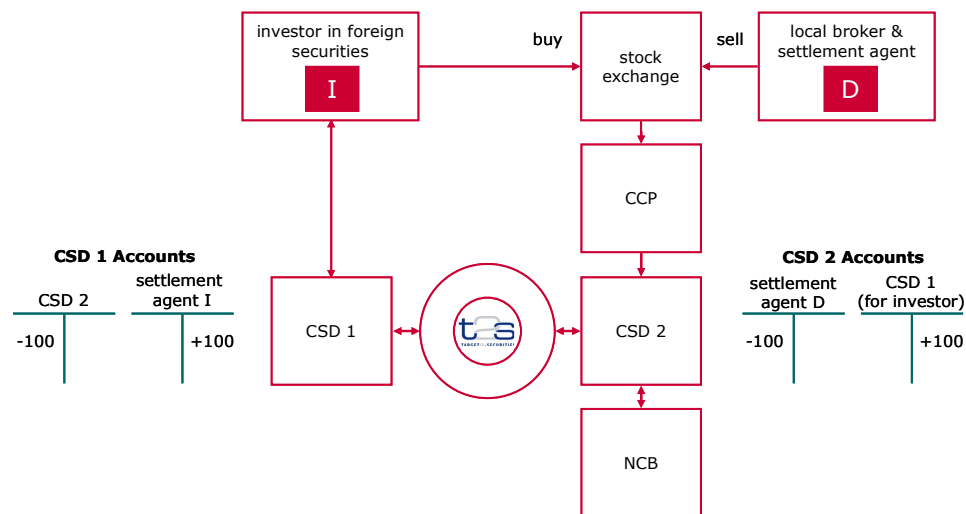


Figure 6: Example of future cross-border transaction between fully interoperable CSDs under T2S

To the investor in foreign securities, the two crucial questions are whether disintermediated settlement will be cheaper, and whether they will obtain the same level of service as before. Both questions have to be answered by the local CSD (CSD 1 in figure 6). The latter, however, is not necessarily equipped to deal with service requests relating to foreign instruments.

To participate in T2S, the local CSD incurs the following up-front and running costs.

1. Direct costs: adoption of connectivity standards such as ISO 20022, T2S interfaces, adaptation of systems to changed settlement process, ...
2. Indirect costs incurred through asset servicing of foreign instruments: account set-up, connectivity with foreign CSDs for custody purposes such as corporate action entitlement reports, capturing master and event data of foreign financial instruments, incorporation of foreign regulatory and tax requirements, negotiations and contracts with other CSDs, hiring local agents for proxy voting, ...
3. Running costs: T2S settlement fee of possibly 15 cents per transaction, settlement and asset servicing costs charged by foreign CSDs, provision of securities master and event master data on foreign instruments, foreign tax processing and regulatory reporting, ...

Investors will expect the same service levels that they are used to receiving from intermediaries, yet at domestic prices. However, if CSDs are committed to full CSD interoperability, they need to move up the value chain and become regional custodians, which entails the establishment and maintenance of a European depositary network. Neither interoperability nor the provision of value-added services will come free of charge. Investors will either have to content themselves with service levels below what intermediaries provide, or pay additional service fees to CSDs.

To investors, the shift from today's intermediary-driven pricing to the T2S model could turn out a zero-sum game. The scope of the T2S investment may even result in rising prices. When the platform goes live, CSDs are likely to increase fees for value-added services to compensate for the loss of settlement revenue.

In our cross-border transaction example (figure 6), competition has ousted intermediaries. Investors will be able to save intermediation fees by settling foreign securities transactions themselves and via their local CSD. In contrast to that, the ECB assumes in its economic impact analysis that transactions will become cheaper even if the chain of intermediaries remains intact. As the total cost of T2S to the market is estimated at 750 million to one billion euros, investors may wonder where exactly the savings will come from.

We believe that savings can only result from disintermediation, as envisaged by the Giovannini Group. Today's domestic CSD transactions entailing complex and expensive cross-border intermediation need to be transformed into straightforward, direct cross-border interaction between investors. Compared to this potential, supposed savings from downsizing the IT infrastructure and operations at the CSD level are negligible. Disintermediation is the actual business case for T2S, not decommissioning of CSD infrastructure.

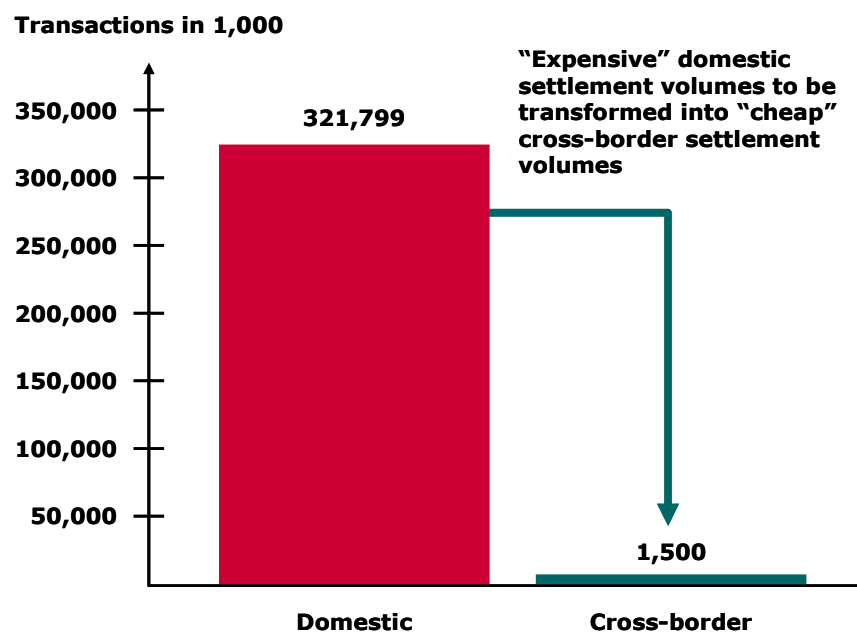


Figure 7: Domestic versus cross-border settlement transaction volumes (30 CSDs) - 2009

11 CSD Readiness and the Cost of Interoperability

In this section, we attempt to determine a timeline for the 30 CSDs engaged in T2S to become interconnected and, thereby, ready to interoperate. This is of critical importance to global custodians interested in the European market, as they aim to ideally minimize intermediation to one pan-European custodian or CSD.

Based on the numbers cited in sections 6 and 7 of this study, full interoperability between the 30 CSDs requires setting up another 805 unidirectional links, which is roughly equivalent to 402 bilateral connections. Experience from the Link Up Markets project introduced in section 3, figure 1, suggests that one CSD will be able to launch a maximum of three bilateral links per year to establish the required asset servicing capability. Even if the links' functionality were limited to servicing a subset of marketable assets, interconnection would cost on average roughly one million euros per bilateral link.

By the same assumption, CSDs that have not yet established any links will take ten years at least to become fully interoperable with their 29 counterparts (29 bilateral links divided by three). Allowing one to three years on top of that to attain general T2S connectivity, the 30 CSDs would be fully interoperable across borders by 2022 to 2024 if they started focusing resources on this project in 2011 and confined themselves to a subset of financial instruments.

The cost of this multilateral endeavour we estimate at around 400 million euros, excluding the additional workload and expenses on the business side, systems operation and maintenance as well as the cost of connecting to T2S (ISO 20022, new interfaces, expansion of account master data and more). To what extent CSDs will pass that investment on to customers remains open to speculation.

Andrew Bailey, Chief Cashier at the Bank of England, has been sceptical about cost reductions through T2S.⁸ The cost issue is one of the principal reasons behind Britain's reservation about joining, which has been a major setback to the project. Bailey requested that the T2S sponsors let the market know how cost reduction shall be achieved.

Hurdle 3: Argue the case for cost savings. The ECB and the CSDs need to step up their joint efforts to explain cost-savings to investors. As T2S will only succeed if accepted by the investor community, T2S and the CSDs must cooperate closely in communicating a coherent business case or price reduction strategy.

⁸ Finextra news, 18 June 2009: "Bank of England Raises T2S Concerns".

12 Need for Harmonization

Implementing a common IT platform and common operational capacities presupposes an ongoing harmonization effort as any exception triggers additional electronic or manual processing, thereby incurring extra cost. Harmonization, however, is a costly and time-consuming exercise, as the repeated postponement of the launch of Euroclear's integrated business platform has shown. While CSDs may interoperate well without harmonizing their business practices (see section 3, figure 1, proposals 2 and 4), the resulting inefficiency is at the investor's expense, especially in asset servicing. That is why Euroclear chose to standardize its custody business before unifying settlement processes on its single platform.

As regards the need for harmonization throughout Europe, T2S is currently working on the easier part, which is settlement. Project scope has been trimmed to the core booking engine.

Aspects related to settlement such as registration may be left for others to elaborate, as has been the case with asset servicing. This approach is remarkable in that the ECB itself should be highly interested in using T2S to drive harmonization as a prerequisite for cutting the cost of cross-border securities transactions.

We estimate that the actual range of instruments settled via current CSD links represents less than five percent of the spectrum specified by the ECB (see appendix D), or some 2,000 instruments per link on average. Supporting the full scope of instruments at 30 CSDs, as proposed by the ECB, would be very expensive, and extend the timeline to readiness far beyond 2022 (see section 10).⁹ Therefore, instead of accommodating an abundance of securities perhaps never traded across borders, we recommend starting with vanilla instruments such as government bonds, highly traded corporate bonds and blue chips, expanding the range as the ongoing harmonization discussion allows. Note: The timeline predicted here would not include integration of domestic transaction volumes onto T2S.

Nevertheless, the overarching objective of reducing the cost of cross-border securities settlement in the European Union will only be achieved if harmonization is pushed forward and constantly revised. In the business case to be presented to investors, the ECB should make harmonization a top priority to lend credibility to the cost reduction argument.¹⁰ After all, the ECB is in a far better position than Euroclear ever was. Not only can it serve as neutral moderator in a competitive environment, but it can also use its political influence to speed up the harmonization efforts of regulators and legislative bodies.

⁹ In our experience, one person is able to add 25 to 50 foreign instruments per day to a CSD's securities master data base.

¹⁰ Example: While T2S allows CSDs to keep omnibus accounts, some countries restrict their use. For insufficient harmonization of CSD account structures, those countries may not be ready when T2S is supposed to go live.

Hurdle 4: Manage harmonization. To reduce cross-border transaction costs, the ECB must push harder for harmonization of both the settlement to be supported by T2S and the asset servicing processes to be supported by the CSDs. Based on the agreements reached with the stakeholders of the project, the ECB should use its political influence to speed up national and supranational harmonization efforts.

13 T2S Governance Structure and Scope

As T2S can become effective only after participating CSDs have established interoperability, the T2S project should take control of the CSD layer's readiness as well as of its own. In view of the interdependence of T2S and the local CSD projects, a common governance structure is of the essence. Such a structure, which will be part of the negotiations for a framework agreement, must reflect the CSDs' feedback on the operating principles of T2S and allow them to align their own IT projects with the common platform's release schedule. As T2S will increase competition among CSDs, the centralized governance structure must be flexible enough to support product innovation.

Hurdle 5: Agree on a common governance structure covering the entire T2S project from release planning, specification and development to live operation and change management.

Some obstacles to timely CSD readiness such as the new ISO 20022 standard are described in the T2S design documents. As shown in appendix E, all CSDs that have published their connectivity standards are using ISO 15022 for messaging. To expedite the rollout of the first T2S release, we recommend interconnecting CSDs to T2S via ISO 15022.

Another way of getting the CSD layer up and running faster would be to apply the 80-20 rule: more than 80 percent of the settlement volumes of the 30 CSDs involved could be covered by 2016 if priority were given to the eight largest candidates (see appendix F), and if the range of financial instruments supported were adjusted to match actual cross-border demand. Under such circumstances, interoperability including asset servicing and securities master data capture should be attainable at an overall budget of less than thirty million euros.¹¹

Hurdle 6: Pursue phased approach to reduce complexity and risks. Apply 80-20 rule to first release. Cooperate with CSDs to speed up T2S readiness through measures such as reduction of instrument scope or using ISO 15022 as the standard for connecting to the T2S platform.

¹¹ Excludes again any integration of domestic transactions volumes onto T2S.

14 Opportunities and Risks

As we see it, the launch of T2S poses the following risks and opportunities to market participants at the depositary level:

- **CSDs:** To compensate for the revenue lost by settling securities via T2S, large CSDs will move up the value chain and offer more sophisticated custody services, thereby entering into competition with regional custodians. Smaller CSDs will cooperate or merge to achieve economies of scale. Given the CSDs' national monopolies, however, we do not expect consolidation of the industry to come quickly. Even if it was to happen, it would take years to unify the infrastructure for the benefit of market participants, as it did in the case of Euroclear's ESES project.
- **Global custodians** are interested in disintermediation and doing business in Europe via a single point of entry such as a regional custodian or large CSD. Note: From a customer perspective, the direct connectivity approach to T2S still needs to be worked on. According to the ECSDA, the direct connectivity solution proposed for T2S cannot fully replace today's CSD connectivity for institutional clients such as global custodians.¹² We therefore assume that it will not make sense for global custodians to establish direct connectivity with T2S as of 2014.
- **Regional custodians** are likely to acquire smaller CSDs, to offer central bank money settlement via T2S and to gain direct access to the T2S infrastructure.
- **Local custodians** will help large CSDs to provide asset services and build up local expertise. Since taking risks falls outside the CSD business model, CSDs are likely to outsource risk to local custodians.

15 Conclusion

Key findings from this study:

- T2S requires a long-term investment of several hundred million euros¹³ from the ECB and participating CSDs. No solid proof has yet been presented that this investment will significantly boost CSD cross-border business, which currently accounts for less than half a percent of all settlement transactions of European CSDs, and thus lower the cost of settlement within Europe.

¹² See document on direct connectivity on ECB website, reference number T2S-07-0245.

¹³ The cost of developing the T2S platform alone is estimated at 250 million euros (see reference 22).

- We estimate that even if T2S were to cover only a subset of financial instruments, it will take until 2022 at least to accomplish full interoperability between the 30 CSDs that signed the memorandum of understanding with the ECB.
- This study has identified six hurdles which T2S must clear to gain the acceptance it needs to succeed on the market.

16 Terms and Abbreviations

Term	Explanation
CCP	Central counterparty
CSD	Central securities depository
DTCC	Depository Trust & Clearing Corporation (US-CSD)
DvP	Delivery versus payment
ECB	European Central Bank
ECSDA	European Central Securities Depositories Association
ESSF	European Securities Services Forum
FoP	Free of payment
Giovannini Group	Formed in 1996, the Giovannini Group advises the European Commission on financial market issues. It focuses on identifying inefficiencies in EU financial markets and proposing practical solutions to improve market integration.
Global custodian	Global custodians process cross-border securities trades, keep financial assets safe and service asset portfolios. Their clients are mostly institutional investors, money managers, brokers and dealers who manage worldwide securities portfolios.
IOSCO	International Organization of Securities Commissions
Investor CSD	An investor CSD opens an account in a counterparty CSD (the issuer CSD) to enable cross-system settlement of securities transactions.
ISO	International Organization for Standardization
Issuer CSD	A CSD through which securities are issued, or where they are immobilized. The issuer CSD opens accounts allowing investors or intermediaries including investor CSDs to hold these securities.
Link Up Markets	Joint venture of ten leading CSDs striving to reduce costs of post-trade processing of cross-border securities transactions by streamlining interoperability on the CSD layer
Local custodian	Bank that provides custody services for securities traded and settled nationally
MoU	Memorandum of understanding on T2S between national central banks, CSDs and the ECB
NCB	National central bank
Regional custodian	Bank that provides custody services for securities traded and settled across borders regionally
SSS	Securities settlement system
T2S	Target2-Securities, future unified IT platform for securities settlement within the European Union

17 CSDs Involved in T2S

Country	Abbreviation	CSD Name	Abbreviation
Austria	At	Oesterreichische Kontrollbank	OeKB
Belgium	Be	NBB-SSS	NBB
Belgium	Ebe	Euroclear Belgium	EBe
Cyprus	Cy	Cyprus Stock Exchange	CSE
Denmark	Dk	VP Securities	VP
Estonia	Ee	Eesti Väärtpaberikeskus	EVK
Finland	Fi	Euroclear Finland	EFi
France	Fr	Euroclear France	EFr
Germany	De	Clearstream Banking Frankfurt	CBF
Greece	Grh	Hellenic Exchanges	HELEX
Greece	Grb	Bank of Greece SSS	BOGS
Hungary	Hu	Központi Elszámolóház és Értéktár	KELER
Iceland	Is	Icelandic Securities Depository	ISD
Italy	It	Monte Titoli	MT
Latvia	Lv	Latvian Central Depository	LCD
Lithuania	Lt	CSD of Lithuania	CSDL
Luxembourg	Lu	LuxCSD	LuxCSD
Malta	Mt	Malta Stock Exchange	MSE
Netherlands	Nl	Euroclear Nederland	ENL
Norway	No	Verdipapirsentralen	VPS
Poland	Pl	Krajowy Depozyt Papierów Wartościowych	KDPW
Portugal	Pts	Banco de Portugal	SITEME
Portugal	Pti	Interbolsa	INTER
Romania	Ro	Depozitarul Central	DC
Slovakia	Sk	Centrálny depozitár cenných papierov	CDCP
Slovenia	Si	Centralna klirinško depotna družba	KDD
Spain	Es	Iberclear	IBER
Sweden	Se	Euroclear Sweden	ESe
Switzerland	Ch	SIX SIS	SIS
UK & Ireland	Uki	Euroclear UK & Ireland	EUK-IE

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20 Appendix B: Cross-Border Settlement Volumes

Figures represent transactions in thousands.

Name	Settlement Transactions (in Thousands)
Oesterreichische Kontrollbank	1,433
NBB-SSS	328
Euroclear Belgium	1,261
Cyprus Stock Exchange	442
VP Securities	16,898
Eesti Väärtpaberikeskus	147
Euroclear Finland	18,428
Euroclear France	30,384
Clearstream Banking Frankfurt	56,014
Bank of Greece SSS	378
Hellenic Exchanges	9,602
KELER	n/a
Icelandic Securities Depository	n/a
Monte Titoli	26,032
Latvian Central Depository	81
CSD of Lithuania	268
LuxCSD	0
Malta Stock Exchange	24
Euroclear Nederland	4,399
Verdipapirsentralen	n/a
Krajowy Depozyt Papierów Wartościowych	10,637
Banco de Portugal	1
Interbolsa	949
Depozitarul Central	2,384
Centralna klirinško depotna družba	444
Centrálny depozitár cenných papierov	20
Iberclear	17,097
Euroclear Sweden	32,272
SIX SIS	34,331
Euroclear UK & Ireland	59,045
total	323,299

Settlement transaction volume derived from ECB statistics, September 2009.

21 Appendix C: Domestic Pricing Competitive to DTCC

Giovannini Group results on six CSDs representing approximately 61 percent of European settlement volumes.

Name	Domestic Settlement Fee (€)
VP Securities	0.600
Euroclear France	0.500
Clearstream Banking Frankfurt	0.325
Monte Titoli	0.720
Euroclear UK & Ireland	0.400
SIX SIS	0.260
weighted average	0.468
DTCC	0.400

Source: Giovannini Group (2001)

22 Appendix D: ISIN Coverage as of 2010

Name	Estimated Number of ISINs Supported as Issuer CSD
Oesterreichische Kontrollbank	20,000
NBB-SSS	300
Euroclear Belgium	5,000
Cyprus Stock Exchange	n/a
VP Securities	n/a
Eesti Väärtpaperikeskus	500
Euroclear Finland	2,300
Euroclear France	46,000
Clearstream Banking Frankfurt	300,000
Hellenic Exchanges	n/a
Bank of Greece SSS	n/a
KELER	n/a
Icelandic Securities Depository	n/a
Monte Titoli	38,000
Latvian Central Depository	200
CSD of Lithuania	500
LuxCSD	n/a
Malta Stock Exchange	n/a
Euroclear Nederland	5,000
Verdipapirsentralen	n/a
Krajowy Depozyt Papierów Wartościowych	n/a
Banco de Portugal	n/a
Interbolsa	n/a
Depozitarul Central	n/a
Centrálny depozitár cenných papierov	n/a
Centralna klirinško depotna družba	n/a
Iberclear	5,600
Euroclear Sweden	7,000
SIX SIS	25,700
Euroclear UK & Ireland	350,000
Total	806,100

Source : ECSDA , CSD websites

Estimated number of ISINs covered by current CSD links: less than 30,000.

23 Appendix E: CSD Connectivity Standards

Name	ISO 15022	ISO 20022
Oesterreichische Kontrollbank	1	0
NBB-SSS	x	x
Euroclear Belgium	1	0
Cyprus Stock Exchange	x	x
VP Securities	1	0
Eesti Väärtpaberikeskus	x	x
Euroclear Finland	1	0
Euroclear France	1	0
Clearstream Banking Frankfurt	1	0
Hellenic Exchanges	x	x
Bank of Greece SSS	x	x
KELER	x	x
Icelandic Securities Depository	x	x
Monte Titoli	1	0
Latvian Central Depository	x	x
CSD of Lithuania	x	x
LuxCSD	1	0
Malta Stock Exchange	x	x
Euroclear Nederland	1	0
Verdipapirsentralen	1	0
Krajowy Depozyt Papierów Wartościowych	1	0
Banco de Portugal	x	x
Interbolsa	1	0
Depozitarul Central	x	x
Centrálny depozitár cenných papierov	x	x
Centralna klirinško depotna družba	1	x
Iberclear	1	0
Euroclear Sweden	1	0
SIX SIS	1	x
Euroclear UK & Ireland	1	0
total	17	0

Source: CSD webpages

1 = available

0 = not available

X = unknown

24 Appendix F: 80 Percent Coverage

Name	Settlement Transactions (in Thousands)	Percentage
Euroclear Finland	18,428	
Euroclear France	30,384	
Clearstream Banking Frankfurt	56,014	
Monte Titoli	26,032	
Iberclear	17,097	
Euroclear Sweden	32,272	
SIX SIS	34,331	
Euroclear UK & Ireland	59,045	
total	273,603	84.63%

total volume	323,299
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Calculated from ECB figures on settlement transaction volumes.

25 Appendix G: About Consileon

Consileon provides strategic, operational and IT consulting to help companies solve complex business issues ranging from positioning on their respective markets through development of marketing approaches to technical implementation. The company is owned by its management team.

For more information, please refer to our web-site: www.consileon.com

26 Appendix H: About the Authors

Micha Sigloch

As Associate Partner at Consileon, Micha Sigloch leads the company's capital markets unit. He has served an apprenticeship in banking and holds a degree in business administration from the University of Augsburg, Germany, as well as an MBA from the University of Dayton, Ohio, USA.

Eleonora Borisova

Eleonora Borisova is a Business Analyst at Consileon. She holds a Bachelor of Arts degree in social sciences from the University of Osnabruck, Germany, as well as a Bachelor of Business Administration (BBA) and an MBA in international business management from the Hogeschool-Universiteit Brussel (HUB).