Explication and the changing of market participants’ subjectivities in securities market integration

Sub-theme 25 Devising Markets and Other Valuation Sites

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Introduction

This paper addresses one of the central premises of the concept of market devices, namely, how the subjectivities of economic agents are (re)configured by market devices (Callon et al., 2007). While the market devices research has addressed how markets behave when devices are incorporated into clusters, we shift research attention to the question of how market devices relate to how markets come about. In particular, how technological and human actors interact and shape one another during the processes through which markets are (re)configured.

This is done through an empirical examination of the practices, processes and technologies involved in an initiative to use information and communication technologies (ICTs) to integrate five key European securities markets by Euroclear, a corporate entity formed out of the merger of the central securities depositories (CSDs) of the UK and Ireland, France, Belgium, and Holland, and international central securities depository (ICSD) Euroclear Bank. This market integration initiative took shape around the proposed integration of a number of key European securities settlement systems, which are the systems in which, following a trade, the securities traded and their ownership are transferred in exchange for a payment. The initiative studied is important because it was the first attempt to establish a truly cross-border marketplace for securities in which the whole set of property rights pertaining to the securities covered would be maintained across the national jurisdictions integrated. So, for example, after integration the owner of French securities in the UK would have exactly the same property rights as one in France and would be able to trade those UK securities through the same account and in the same way as the French ones. The study followed the development of a single ICT-based system that would be shared by all the national CSDs involved and would make possible the settlement, across borders, of securities transactions between these national marketplaces.

The empirical setting provides a valuable opportunity to study a market ‘in the making’ (Latour, 1987, MacKenzie, 2009). More specifically, this makes possible the following of the sociotechnical articulations involved in the creation of an expanded circuit of financial exchange and the description of how the necessary exchangeability and commensurability of objects of exchange across previously separate market sites is attempted. Through the
following and describing of these articulations over time, it is then possible to gain a better understanding of the changing subjectivities of the various agencies involved vis-à-vis the proposed version of an expanded circuit of financial exchange.

To do this, the article focuses on the way that the distribution of responsibilities and roles of key market agents are negotiated and reconfigured, and how new subjectivities and meanings are generated through the framing and unfolding of these sociotechnical trials.

In particular, the article concentrates on how, once key components of the IT system at the centre of the market integration initiative become concrete functioning entities, they start to give the abstract conceptualisation of a cross-border marketplace a durability and materiality which, in turn, makes the implications of that abstract concept of market integration much more explicit and visible to those concerned. In this way, and through the responses generated from those concerned, new and often obscure aspects of an abstract proposed future market architecture (Callon and Muniesa, 2005) become knowable to these agencies.

The article thus aims to contribute to the further development of the concept of ‘explication’ (Muniesa, 2011, Muniesa and Linhardt, 2011, Marres, 2012) and how this can be integrated into a broader notion of ‘devising’ (McFall, 2014) by seeking to analyse the role of financial market IT systems in the reconfiguring of marketplaces in terms of ‘explication’, and proposing ‘explication’ as a key aspect of the way the reflexive and reasoning capacities of the agents involved are transformed through the changing perceptions and understanding of their positioning within an emerging digital transnational financial markets landscape.

**Theoretical background**

Over the past two decades, scholars in the field of science and technology studies and Information Systems and have challenged mainstream sociology by putting forth the view that the sphere of the social is inseparable from that of the material (Pickering 1993; see review by Orlikowski and Scott 2008).

Actor-Network scholars have also argued that social relations, as Latour (1986) stated, are not an explanatory cause of phenomena, but a consequence of material associations. The importance of material artefacts in shaping social relations can be learnt from societies that
lack technology, such as those of animals (Latour, 1996). In contrast, in human societies technological artefacts may enforce norms. Speed bumps, for example, keep school streets safe for pedestrians without need for school principals admonishing drivers to slow down (Latour, 2002, Latour, 1992). The heavy keychain used by traditional hotels ensures the safety of guests by forcing other guests to leave their keys in reception before they leave the hotel, reducing the danger that they might lose their key (Latour, 1992).

Pickering (1993) offers a more comprehensive analytical framework of the human-technological relationship by showing that the emergence of the scientific instrument known as the bubble chamber involved both technological and human agencies, and that it is impossible to separate both effects. Pickering sees technological agency in Glaser’s accommodation of the chamber design as a response to the failure of vapour to register cosmic rays in the chamber. Yet Pickering also sees human agency in David Glaser’s decision to redesign the chamber again so as to remain in a small lab rather than joining a large bureaucratized one. Both technological and social factors, Pickering (1993: 559) concludes, shaped the eventual design of the chamber in a way that cannot be analytically separated.

Latour and Pickering imply at an inherent political process that underpins the interaction between the intertwined domains of the technological and the social: the shape, at any given moment, of technological society (and, as a derivation, technological organization) is a function of the extent to which the domains affect one another. Extending this view to markets and how markets come about, we need to develop more precise frameworks for conceptualising the ability of technology and the social (in this empirical case, market actors) to shape one another.

Political sociologists have theorized extensively how markets are affected by politics. Research work by scholars such as Fligstein (1996) or Ingram and Rao (2004), show how governments take part in shaping markets and, in particular, how principles and values are presented, translated and mobilized as part of this process. The analysis places governmental regulation at the heart of the economic-political interface, a position that allows the wielding of significant influence over the practices and norms of market actors. This line of the
theorising, which focuses on the processes of institutionalisation, examines the ways in which the political sphere impacts the shaping and altering of financial institutions.

This theoretical perspective, which implies in a market context that, for example, regulators delimit the scope of markets and that governments play central roles in shaping crucial legal and social entities such as property rights, governance structures and rules of exchange, ignores the role of technological artefacts in shaping markets. This leaves aside, for example, the way that property rights depend on a number of important technological objects and systems for their upholding and exercise, or how regulators operate in markets via the technological domain. It is by, as Callon (1988) argues, inscribing into devices elements from their worldviews that regulatory agencies are able to exude influence that goes beyond simply containing the operational scope of markets. They are able to do so because of the way market devices can be designed to frame and shape practices on a day-to-day micro level in ways that would be too resource-consuming and perceived as too intrusive had they emanated directly from the regulator.

We suggest that this process of market device inscription relies on a series of events that can be regarded as public experiments (Collins, 1988; Shapin 1992; Collins and Evans, 2008). These experiments test, ultimately, whether or not an increasingly explicit model of technological organization embodies more faithfully a set of theory-driven principles. The experiments aim to embed different (even frequently conflicting) normative claims from the different actors who have stakes in the development of a technological organisation. The implication of this conceptualization for understanding how markets are (re)configured is that such processes and the organizations resulting from them are not simply an outcome of technological determinism; nor that a market technology is prescribed by regulatory and theoretical directives or the disinterested pursuit of efficiency. Instead, the emergence of market organisations such as Euroclear studied in this paper, is a process whereby different and changing worldviews motivate the development of technological devices and rules, which, once put into action fully or partially, in effect, put into motion a market experiment on a ‘one-to-one’ scale along the lines of a Latourian ‘trial of strength’ (1993).

In order to understand better the mutual shaping of human and technical agencies that takes place in such experiments and to ground some of the more overarching theorisations
Devising Markets and Other Valuation Sites


The notion of explication (Muniesa, 2011, Muniesa and Linhardt, 2011, Marres, 2012), considered in conjunction with that of subjectivity (McFall, 2014, Domingues, 2000, Domingues, 1995), can contribute towards developing a notion of ‘devising’ that describes how human and technological agencies shape or format each other in the process of market (re)configuration and how market devices are inscribed in the process. Explication provides a good approach to analysing, in a way that brings into the picture how cognitive changes are related to changes in subjectivity when considering such public experiments or trials (Thrift, 2008).

Explication builds on the existing descriptions of iterative process of experimentation through which, at the end of each iteration the empirical material collected via the experiments is fed back to a new iteration of the technological organisation, in this case a new market in the making, by focusing on how, through this iterative process, previously obscured ‘folds’ of the techno-institutional arrangement being assembled become observable and their implications knowable through the trials resulting from materialisations coalescing around even small component devices. The stabilisation of such devices creates the necessity for specific material rather than discursive responses from the world around it (Barry, 2002). The new entity starts to set limits on possible events (Barry, 2002) and starts to make explicit its needs from, and consequences for, the world around it. It becomes a concrete interrogation of the existing world – both conceptual and material – surrounding the integration initiative (Barry, 2002).

Such explication is crucial to the planning and foresight, but also to the inspiration necessary for both the designers and users of a market under development to formulate their plans, strategies, and positions vis-à-vis the expanded and transformed marketplace arrangements.
being pursued and to respond to them. It is in this way that the subject becomes internal to the
device (Callon et al., 2007). Out of the experiments and the explication these trials engender,
designers, users, regulators, and the other agencies involved are changed, both cognitively
and in terms of their perceptions of themselves and of the role they should/could/would
perform in the new configuration of techno-institutional arrangements proposed. It is in this
way that previously well-defined ‘roles’ (Akrich, 1992) that enabled the market device of a
national securities market to be performed and through the performance of which its
calculative qualities are realised, are be altered, and a new distribution of roles, actions, and
attributes to both the human and non-human elements of the new ensemble attempted. As
these shifting subjectivities gradually become woven into the device, more well-defined roles
are arrived at, and in this way subjectivities, both at an individual and collective level
(Domingues, 2000, Domingues, 1995), can become enacted in a device (Callon et al., 2007).

Through an investigation of how explication and subjectivity interact in the development of
market devices, this article seeks to contribute to the development of the concept of devising
as a dynamic, unfolding, and complex process of materialisation relevant both to ‘markets in
the making’ (MacKenzie, 2009, MacKenzie, 2005), but also more widely on the broader
debate on the relationship between technology and society (Orlikowski, 2009, Orlikowski
also on other debates about how notions of collective subjectivity can be part of social
organisation (Domingues, 2000, Domingues, 1995).

**Research Setting**

The empirical research setting studied was a pioneering securities marketplace integration
initiative by Euroclear, a corporate entity formed out of the merger of international central
securities depository (ICSD) Euroclear Bank, and the national CSDs of France (2001),
Holland (2002), the UK and Ireland (2002), and Belgium (2007).

The consolidated group that emerged out of the mergers reflected the ownership structure of
its constituent entities that took the form, primarily, of cooperatives owned by the market
participants and reflecting their usage of the constituent settlement systems. In turn, the
relative weighting of each constituent marketplace determined the proportion of the new consolidated entity that market participants from the constituent entities would hold.

In 2008 Euroclear also acquired the Nordic Central Securities Depository (NCSD) from Nordic banks Nordea, SEB, Svenska Handelsbanken and Swedbank. As a result, the CSDs of Finland and Sweden now operate as part of the Euroclear group as Euroclear Finland and Euroclear Sweden, respectively (Finextra, 2008). Euroclear as it is today also owns EMXCo, a provider of investment-fund order routing, and also offers commercial collateral management services, third-party securities lending services and dedicated fund services to both the buy and sell sides of fund distribution (Euroclear, 2013).

Although 86%-owned by its users, Euroclear operates as a ‘for profit’ entity (Euroclear, 2013). The consolidated group now covers over 65% of European blue-chip equities and 50% of European domestic debt outstanding and in 2013 had a turnover of €573.8 trillion from 170.4 million transactions and held securities worth €24.2 trillion (Euroclear, 2013).

CSDs such as those assembled in the Euroclear initiative are key institutional and technological entities in the transfer of property rights in most securities markets as they act as an interface between the market and the legal and fiscal regimes of particular jurisdictions (Donald, 2013). CSDs used to be the venues at which the physical securities certificates were stored and in which they would be physically moved from the account of one counterparty to that of another upon the completion of a transaction and the confirmation of the delivery of the payment by the opposing party in the trade (Donald, 2013, Norman, 2007, Wells, 2000). While the physical transfer of securities between holders has been replaced, first by the transfer of records on ledgers as ‘book entries’ (immobilisation), and then by the changing of digital electronic entries in databases (dematerialisation) (Norman, 2007, Donald, 2013), CSDs remain crucial entities in the definition of ownership over securities and the property rights and obligations that go with that ownership.

At first glance securities settlement might appear as a straightforward process, the increasing use of securities for lending and as collateral for payments and covering obligations means that the role of the CSDs and the ICT systems they use for settlement is far from simple (Committee on Payment and Settlement Systems, 1995, Schmiedel and Schönenberger,
Furthermore, the need for legal certainty and finality necessary for transactions to be completed in an incontestable way make it imperative that even the slightest time discrepancy between the payment and delivery is avoided in order to reduce the likelihood that some payment default may occur when the securities have already been delivered (Committee on Payment and Settlement Systems, 1992).

CSDs operate securities settlement systems which relate to the other stages of a typical securities transaction as depicted in Fig. 1. As can be seen, settlement is of core importance because no securities exchange transaction is complete without the mutual obligations entered into by the transacting parties being discharged through the reciprocal movement of the stocks and money being exchanged, from one transacting party to the other (Slater, 2002, Callon and Muniesa, 2005, Millo et al., 2005). Settlement systems are crucial to this because
they ‘script’ these interactions in a way that reconciles the need for the legal determinacy that
must underpin the ownership and transfer of titles to securities and other financial
instruments with the need for the operational flexibility that makes possible the most efficient
deployment of the scarce collateral (cash and securities) of market participants (Sommer,
2001). Any financial marketplace integration initiative will depend on developing appropriate
settlement arrangements so that claims and obligations are managed in an orderly, acceptable,
predictable, and incontestable way in the expanded marketplace (Millo et al., 2005).

Within this context, the clearing and settlement activities of financial markets have started to
be seen as an integral part of the broader sociotechnical processes that structure and organise
economic exchanges in these markets, contributing to their calculative functions and giving
them their particular characteristics (Millo et al., 2005). This is because the legal,
institutional, fiscal, economic, administrative, governance, risk management and
technological structures with which actual financial marketplaces are entangled – and for
which clearing and settlement systems are a central nexus – are increasingly viewed as
fundamental to the functioning and outcomes of these markets (Callon and Muniesa, 2005,

**Research Approach**

The study presented in the paper traces, through the following of key controversies relating to
the development of the Euroclear cross-border securities settlement system, how, through the
various trials and resistances triggered in its development, the views of key market
participants of themselves and of their positions and roles in the new expanded transactional
space ‘in the making’ are reconfigured, but also how the new roles proposed by the
marketplace designers are understood and reacted to through the prism of their own strategic
outlooks regarding their future position and role in an emerging global digital financial
markets landscape.

Underpinning the research approach adopted is the notion of technological objects (in this
case the cross-border settlement system under development) as non-verbal ‘scripts’ that
assign actants roles through the enactment of which a technology is performed (Akrich, 1992,
Akrich and Latour, 1992, Latour, 1996a). As with a script for a play or film, the technological
object can be seen as allocating roles, actions, and attributes to both the human and non-
human elements of an ensemble of heterogeneous actants that underpin its performance
(Akrich, 1992). The success of a system then comes about when the ‘actors’ involved,
collectively ‘perform’ the ‘script’ inscribed in it by those who have developed it.

Akrich identifies controversies as the key unit of analysis when studying such objects, seeing
them as a way of finding the circumstances in which “the inside and outside of objects are not
well matched” and which leads to disagreements, negotiations, and the potential for
breakdowns that provide a good setting from which the mechanisms of adjustment among the
various actors can then be described (Akrich, 1992, p.207). While with regard to every object
there is a ‘consensual zone’, it is around points of friction in ‘controversial zones’, usually
found around the margins, that “the battles leading to the establishment of supremacy of a
certain design or solution are waged (Akrich, 1992, p.223).

One practical approach suggested in order to do this is to follow the negotiations between the
designers of the new technological artefact and the potential users and study the way in which
the results of such negotiations are “translated into technological form” (Akrich, 1992,
p.208). In this way, how “technical objects and people are brought into being in a process of
reciprocal definition in which objects are defined by subjects and subjects by objects” is

**Evidence collected**

In this tracing, one important body of empirical material collected and analysed was the
consultative and other project-related documentation assembled during the course of the
design and development of the cross-border settlement platform. This included a number of
technical manuals and terms and conditions documents; third-party responses to public
consultation processes relating to the development of the new system, and minutes and
reports from Market Advisory Committees (MACs) a forum established for the
representation of the interests of market participants in the particular national marketplaces to
be integrated.
Another substantial body of empirical material was archival documentary material relating to
the existing settlement systems, (e.g. operations manuals, terms and conditions documents,
newsletters, statutes, public policy and commercial reports).

Apart from the documentary material, a number of interviews and ad hoc informal
communications with people from both the settlement platform development side and market
participants were also undertaken, as shown in Table 1 below.

One of the researchers also participated in workshops organised by Euroclear for market
participants ahead of moves to the new integrated system from which notes, documents and
presentational material used in the workshops were also collected and utilised.

Finally, a number of press releases, articles from the press and other media reports also
formed part of the empirical material studied and analysed.

<table>
<thead>
<tr>
<th>Actant</th>
<th>Roles</th>
<th>Interviewee</th>
<th>Number of Interviews and Duration</th>
<th>In-text Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central bank</td>
<td>Market supervision; public policy making; Inter-bank payment system operator</td>
<td>Former director (overview of market infrastructures)</td>
<td>2 interviews; approx. 1h45min each</td>
<td>Interview A1, Interview A2</td>
</tr>
<tr>
<td>Market Advisory Committee</td>
<td>Market participant representation</td>
<td>Chairman of UK committee</td>
<td>2 interviews; 40min and 1h</td>
<td>Interview B1, Interview B2</td>
</tr>
<tr>
<td>Market Advisory Committee</td>
<td>Market participant representation</td>
<td>Member of cross-market committee</td>
<td>1 interview; 20min</td>
<td>Interview C</td>
</tr>
<tr>
<td>CSD</td>
<td>Settlement system operator; settlement system design and development</td>
<td>Director of Business Model and Harmonisation</td>
<td>3 interviews; approx. 2h each</td>
<td>Interview D1, Interview D2, Interview D3</td>
</tr>
<tr>
<td>CSD</td>
<td>Settlement system operator; settlement system design and development</td>
<td>Director of Strategy and Public Affairs</td>
<td>1 interview; 40mins</td>
<td>Interview E</td>
</tr>
<tr>
<td>CSD</td>
<td>Settlement system operator; settlement system design and development</td>
<td>Head of Standards and Communication</td>
<td>2 interviews; approx. 2h each</td>
<td>Interview F1, Interview F2</td>
</tr>
<tr>
<td>Financial Services Provider</td>
<td>Market participant; global custodian; CSD shareholder;</td>
<td>Head of Global Custody</td>
<td>2 interviews; 40min and 45min</td>
<td>Interview G1, Interview G2</td>
</tr>
</tbody>
</table>
Financial advisor to Exchange owner/operator

<table>
<thead>
<tr>
<th>Financial Services Provider</th>
<th>Settlement bank services; Company Registrar services; Market participant; CSD shareholder</th>
<th>Head of Settlement Bank operations</th>
<th>1 interview; 40min</th>
<th>Interview H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large multinational corporation</td>
<td>Market participant (issuer; investor);</td>
<td>Senior Corporate Treasury manager</td>
<td>3 interviews</td>
<td>Interview I1</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Interview I2</td>
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<td>Interview I3</td>
</tr>
</tbody>
</table>

### Table 1: Interviews undertaken

The project documentation was chosen as a central focus of the research because it circulated across organisational and practice boundaries (Star and Griesemer, 1989) and also represented an unambiguous, public, and easy to follow trace of the developing associations that would eventually form the new marketplace.

By law, this documentation was public and freely available as settlement system operators are obliged to consult with market participants whenever any new functionality the use of which will not be optional is introduced. The way the documentation worked in this capacity can be understood from the following explanations regarding the aims of consultation and other project-related documentation provided by Euroclear:

> “Consultation papers are dynamic papers, typically one per programme, which are regularly updated with outcomes of feasibility analysis, market consultation input, etc. (...) Working papers are interim or ad-hoc papers used for work in progress when required. They cover specific items that, once finalised, will be included in the consultation papers. In addition to direct communication with clients, consultation is also formally conducted through the Market Advisory Committees”. (Euroclear, 2003, pp. 11-12).

The documents and texts involved in the design and development of the new settlement system, therefore, provided a trace of the process of public writing and re-writing,
commenting, modification, and attempts to identify common ground and key sticking points and points of controversy among the proposed script and the actants to be enrolled and assembled by it.

**Analysing the evidence**

Our approach treated documents, as Preda suggests, as “organizational devices, with the help of which relationships are created, maintained, and managed across various contexts” (Preda, 2002, p.208) and as Cooren proposes in relation to texts such as reports, contracts, memos, and work orders, as participating in the stabilization and repeatability of organisational activities over time (Cooren, 2004). The consultative and other project-related documents, therefore were not analysed primarily in terms of their content, but for the way in which they build a world of their own through the establishment of associations between actants (Latour, 1996a).

The focus of analysis was on tracing the controversies involved in the development of the integrated cross-border settlement system among the designers and developers of the system and the actants to be assembled around the roles proposed for them in the new integrated marketplace. As the development process unfolded, moving from conceptualisation, to the drafting of business plans, the merger of corporate entities, consultations with market participants, and the development of ICTs, the changes to the inventory and roles of the actants to be brought together was traced and particular controversies relating specifically to ITC components of the sociotechnical network being assembled were focused on as well as the choices made in order to try and resolve them and bring about a stabilisation of roles and relationships proposed by the system developers.

In practical terms, key controversies (and their elements) were identified through the increases in document generation relating to particular consultative iterations undertaken by the Euroclear development team. Once the relevant documents were identified in this way, by comparing versions of these consultative documenters it was possible to see which the key contentious passages were and how the sociotechnical associations they proposed changed from one iteration to the next, until resolution and stabilisation was achieved and the resulting arrangement could then progress from proposal to system specification. Investigative
attention could then focus on the key controversies thus identified also through interviews, informal contacts and conversations, recourse to legal texts and statutes, and so on. In this way, relevant actants involved in some particularly interesting type of sociotechnical articulation could be identified and the necessary further evidence relevant to their involvement collected in the form of verbal and email clarifications to be sought, identification of relevant media coverage to be collected, and developing specific lines of questioning for the formal and extensive interviews undertaken.

Taking this approach, it was possible to: a) identify what the key sociotechnical controversies around the development of a cross-border securities settlement system were and how are key actants were positioned in relation to them; and b), describe how these controversies and the relations of the actants involved in them evolve through the various design iterations until some settled state or breakdown were reached.

The analysis then focuses more specifically on how, in relation to these controversies, the reflexive and reasoning capabilities of key market participants changed through the trajectories of these controversies through the tracing of changes in their positions vis-à-vis these controversies and what these changes indicate regarding their perceptions and understanding of their positioning within the expanded circuit of financial exchange proposed by the market integration initiative designers.

**Empirical account**

The objective of the Euroclear securities market integration initiative can be summed-up by the phrase: “*Delivering a domestic market for Europe*”. This phrase was used by Euroclear as the title for the first public document on its plans for developing a cross-border settlement system for securities that was published in July 2002 and which states:

> “We intend to cut away the current costs and complexity of cross-border settlement by removing the borders. We intend to create a single domestic settlement space covering the five countries in the New Group – Belgium, France, Ireland, the Netherlands, and the United Kingdom.” *(Euroclear, 2002, p.5)*
The empirical investigation presented here focuses on the first major element of the new settlement system to be developed that would be the Single Settlement Engine (SSE). By providing the existing separate national settlement systems with a shared core functionality it was envisaged as a bridge between the separate existing individual securities marketplaces to be integrated, realising in the process substantial network effects and economies of scale.

The SSE would replace the existing core settlement processor systems of the constituent CSDs while leaving other components of their legacy systems largely in place (see Fig. 2). Once completed, the SSE would be in a position to deliver settlement of cross-border transactions across the various group entities on an *internal book-entry basis*. This meant that users would be able to access any securities they hold with any CSD in the consolidated entity through a single umbrella account with sub accounts, allowing transfers across these accounts to be treated as *internal transfers*, eliminating any external costs and transforming them into simple book-entry transfers as would be the case with a domestic trade.

The Euroclear developers saw the SSE as a crucial step in terms of dealing with the complexity of the various existing national settlement systems. The anticipated that the scope and complexity of the initial integration would be reduced as market participants would interact with the SSE through existing interfaces with the local CSD settlement platforms using the existing messaging and reporting functions and contractual agreements, with each set of securities held in the local CSDs remaining subject to local asset protection and transfer legislation (Euroclear, 2003).

The relationship between the CSDs and the operator of the SSE was to be structured as a “contract for the provision of services”, whereby each of the constituent CSDs will outsource parts of its IT processing to the SSE operator and would be similar to third party outsourcing arrangements for IT services already in place on the side of the local CSDs (Euroclear, 2003, p. 17).

The SSE came into operation with the French CSD on 29 May 2006 and the UK CSD on 28 August 2006 and with the Euroclear Bank ICSD at the end of 2006. During a second phase, a complete consolidation of all constituent CSD platforms and systems was envisaged (see Fig 2), providing access to the new shared platform over a common interface for all users of the
consolidated Euroclear group, irrespective of jurisdiction (CRESTCo, 2004). Upon completion of migration to this new Single Platform users would have the possibility of accessing all securities settled through the combined system “through one securities account, with one interface, one payment relationship”, but “with a choice of service levels and tariffs” (Euroclear, 2002, p.8).

Table 2 below summarises the key controversies identified in relation to the SSE, their interrelations, and how these unfolded over time.
<table>
<thead>
<tr>
<th>Controversy</th>
<th>Key actants</th>
<th>Evolution/Outcome</th>
<th>Related Controversies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Definition and distribution of integration benefits</td>
<td>Euroclear management; Euroclear shareholders, Traders/dealers, Custodians, Registrars</td>
<td>Even up to the launch of the SSE, this controversy persisted around doubts regarding the extent of market-wide cost and efficiency gains and who they would accrue to. Custodians who saw a threat to their business became a vocal and public opposition that also included market participants concerned at a possible non-user owned for-profit system that would 'privatise' the market-wide benefits that might result. Eventually became entangled with the controversy around the interfacing with Targe2 and the ECBs T2S proposal with those concerned about the Euroclear approach supporting the ECB proposal and their lobbying seen as having prompted the greater interest of the ECB in the issue.</td>
<td></td>
</tr>
<tr>
<td>2. Ownership and governance</td>
<td>Euroclear management; Euroclear shareholders, Traders/dealers, Custodians, Registrars, Settlement banks, Exchange owners/operators</td>
<td>Euroclear sought to allay market participants’ fears of a possible non-user owned/controlled for-profit system or one that would not reflect the balance of interests of the different market constituencies by giving greater prominence to the role of the MACs and their ability to take grievances to the Euroclear board. Concerns persisted however because the board could ignore the representations of the MACs if it so chose and non-users could become shareholder of the new entity operating the system. Eventually got subsumed in the wider controversy around the ECBs T2S proposal.</td>
<td></td>
</tr>
<tr>
<td>3. Competition between exchanges, financial centres, and ICSDs</td>
<td>Exchange owners/operators, Shareholders in Exchange operators, EU regulators, National governments</td>
<td>Controversy persisted and also became entangled in the wider controversy around the ECBs T2S proposal, with rival exchanges to Euronext seeing the Euroclear initiative as providing a key post-trade functionality for Euronext at no expense. In addition, the ability of Euroclear Bank to offer such low-cost cross-border access to such an expanded liquidity pool was seen as unfair competition to rival ICSDs such as Clearstream. EU competition commission concerns and lobbying of rival exchanges and ICSDs together with concerns of EU member-states for the implications for their exchanges fed into ECB T2S proposal.</td>
<td></td>
</tr>
<tr>
<td>4. Cross-marketplace book-entry transfer of securities</td>
<td>SSE development team, Local CSD technical teams, Euroclear legal advisers, SSE ICT suppliers, high-speed secure network technical components, database software, High-performance computing hardware, MACs, National fiscal authorities, National</td>
<td>The issue around the Legal Record got solved thanks to the ability of the high-speed secure networks, database software and high-performance computing to performing the mirroring necessary in a secure, resilient, and reliable way and with the volumes and speed needed to ensure timely and uncontested finality of transactions in such a way that DvP as defined by BiS would be achieved</td>
<td></td>
</tr>
</tbody>
</table>

1, 2, 3, 4, 6
5. New algorithm and settlement failures

SSE development team, SSE technology providers, SSE technology consultants, Traders/dealers, Settlement banks, Regulators

Euroclear used workshops and training sessions for Market Participant post-trade technical and business process specialist teams to work through concerns and allay fears about how existing transaction failure management might be affected by the use of the new algorithm by ensuring they had a sufficient understanding of the potential changes to be able to understand for themselves how the changes might play-out in relation to their own operations and transacting practices.

1, 4

6. Cross-border payments

APIs and electronic messaging technologies, SSE development team, MACs, Central bank RTGS technical teams, ECB technical teams, ECB board, National governments

While functionally the links using central bank payment channels were operational, the issue around interfacing vs. integrating between the Target 2 inter-central bank payment system and the SSE remained a sticking point which led to the proposal by the ECB to develop its own cross-border T2S platform and around which many of the other persisting controversies around the distribution of benefits, ownership and governance, and unfair competition coalesced.

1, 2, 3, 4

Table 2: Summary of key controversies, the relations among them, the actants involved, and their evolution. The acronyms used are explained as follows: EU (European Union); SSE (Single Settlement Engine); CSD (Central Securities Depository); MAC (Market Advisory Committee); ECB (European Central Bank); T2S (Target 2 Securities); ICSD (International Central Securities Depository); DvP (Delivery versus Payment); BiS (Bank of International Settlements).

In order to develop further the notion of explication and how it relates to the subjectivity of market participants, we focus our empirical account on two of the key actants (the ECB and a Custodian with significant European cross-border business) and their relations to the controversies identified above, describing their changing positions and how these relate to the development of the SSE. This enables us to go into more detail and depth in relation to those actants and the controversies they were primary participants in, even if this is at the expense of a more all-encompassing analysis across the all actants/market participants involved. At the same time, as many of the other actants involved are inevitably encountered in the controversies we examine, their participation in the unfolding of events is not ignored.

The SSE and the role of Custodians

Custodians are financial service providers that provide safekeeping and transaction management for securities and other financial assets on behalf of clients. They are able,
through networks of local subsidiaries and agents, to buy, sell, and hold securities for their clients outside the home jurisdiction of these clients, while conveying the benefits of this ownership to them in their home jurisdiction. The clients, however are only the ‘beneficial’, not outright owners of the securities without the full range of property rights that outright ownership would confer (Schwarcz and Benjamin, 2002).

One major controversy of relevance to the Custodians, particularly those with large proportions of their market share in cross-border business in the marketplaces being integrated, was around the impact benefits the new arrangement would deliver in terms of lower costs for cross-border business. This group of custodians were hostile to the initiative because it would deprive them of a large chunk of their custody business revenues. Furthermore, it provided other custodians with cross-border business beyond the markets to be integrated (e.g. serving clients with a large proportion of North America to Europe cross-marketplace transactional needs) with a very cost-effective solution for offering their clients low-cost but high-value access to a large European pool of liquidity.

It was anticipated by Euroclear that cross-border transaction costs could be reduced “by up to 90%” bringing them down to the “levels prevailing in domestic markets” and giving users the opportunity to “access directly a single operational securities account, on a single platform, spanning domestic securities markets” (Euroclear, 2007, p.1).

The anticipated cost savings envisaged from this initiative are presented in Table 3 that follows.

<table>
<thead>
<tr>
<th>Cost savings</th>
<th>Sources of savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariffs</td>
<td>Replacement of expensive cross-border CSD charges by domestic charges for market participants</td>
</tr>
<tr>
<td>Back office</td>
<td>Standardisation of back-office procedures for market participants across five previously separate sub-units.</td>
</tr>
<tr>
<td></td>
<td>Reduction of interfaces to settlement platforms with different</td>
</tr>
</tbody>
</table>
technical specifications, messaging arrangements and operating practices.

Consolidation of IT systems and avoidance of duplicate investments at the European level (e.g. two data centres instead of eight, fewer inter-CSD links to manage and maintain, lower development costs due to increased purchasing power vis-a-vis IT suppliers, rationalisation of support functions and back-up arrangements, reduced number of systems upgrades).

Reductions in the credit risk resulting from timing differences between the settlement process in a local market and the delivery of the securities to another local CSD.

Reductions in the operational risk involved in multiple and often complex and unwieldy interfaces between separate marketplaces.

More efficient use of collateral resulting from the avoidance of fragmentation across separate settlement systems

<table>
<thead>
<tr>
<th>Infrastructure investment</th>
<th>Risk reduction</th>
<th>Working capital</th>
</tr>
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<tbody>
<tr>
<td>Consolidation of IT systems and avoidance of duplicate investments at the European level (e.g. two data centres instead of eight, fewer inter-CSD links to manage and maintain, lower development costs due to increased purchasing power vis-a-vis IT suppliers, rationalisation of support functions and back-up arrangements, reduced number of systems upgrades).</td>
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<td>More efficient use of collateral resulting from the avoidance of fragmentation across separate settlement systems</td>
</tr>
</tbody>
</table>

Table 3: Anticipated cost savings from integration initiative

Questions around the distribution of benefits from the proposed new system also related to how the ICSD component of the Euroclear group would gain a potentially unfair competitive advantage vis-a-vis other ICSDs (e.g. Clearstream, SIX SIS) as a result of lower costs from economies of scale, much larger revenues, and control of a strategic location in the emerging global financial services marketplace.

Finally, there was also disquiet about the benefits that may be conferred to particular stock exchange operators as competition and consolidation in that market increased, particularly in Europe, with the Euronext grouping bringing together the Paris, Brussels, Amsterdam, and Lisbon stock exchanges seen as potentially gaining in terms of what was seen by some as the subsidisation of the development of a crucial market infrastructure for their markets vis-à-vis other exchanges (e.g. Deutsche Boerse group, LSE, Milan Burse) that would have to develop
their own cross-border post-trade infrastructure if they sought to expand through mergers with, or acquisitions of, other exchanges in Europe.

This controversy overlapped with the one around the ownership and governance of the new entity. The custodians above, together with a number of UK-based market participants had concerns in relation to the potential loss of the influence they enjoyed in the running of UK CSD CRESTCo where market participants owned the company and shareholdings reflected their use of the system, with rebalancing of shareholdings at regular intervals and the return of profits to the users via fee reductions.

With the new cross-border entity, in the first instance the shareholdings in the combined concern of the various constituent entities reflected the relative ‘weight’ in the combined system of each individual CSD in terms of system usage. These would then be distributed to the members/users of the individual constituent CSDs according to the arrangements and shareholdings prevalent at the individual local CSDs.

While there would be no formal shareholder re-balancing mechanism for the combined entity, as was the case with CRESTCo in the UK where shareholdings would be periodically altered to reflect changing levels of usage of the system by a particular user or user group, there was only a vague commitment from Euroclear “over time to enable shareholders to increase their shareholdings where that is justified by their usage” and to enable “users who are not shareholders to acquire shares” (Euroclear, 2002, p.38). There was, however, no requirement for a holder of Euroclear shares to be a user of the Euroclear systems (unlike the comparable provision in the CRESTCo). Furthermore, it was in the discretion of Euroclear directors to refuse to transfers Euroclear shares if they so wished.

There was also no formal mechanism proposed for the distribution of profits in a way that balanced returns to shareholders with rebates and fee reductions to the market as a whole and investment in the settlement platform. It was simply suggested that there should be a distribution of dividends “at least equal to 60% of the first 15% of return on equity”, with the Board of Euroclear deciding on an annual basis “the distribution of the financial surplus” in terms of retained earnings, fee rebates for customers, and dividends to shareholders (Euroclear, 2002, p.33). The composition of the Board itself would “reflect the geographical
and sectoral spread of the combined group’s users” and would also include two independent directors “not associated with any user firm” (Euroclear, 2002, p.36).

Instead, Euroclear proposed the formal institution of Market Advisory Committees as a way of ensuring responsiveness towards the interests of market participants. Already part of the French settlement system, Market Advisory Committees (MACs) would now be introduced to the other domestic markets and strengthened by being given a formal status with defined rights and responsibilities. Although these MACs would “not replace the Boards of Euroclear Plc or Euroclear Bank as the decision making bodies of these companies”, their influence would, according to Euroclear, be significant as they would have the right to address directly the Chairman and the Board if they consider that it is necessary (Euroclear, 2002, p.37).

Membership of the Market Advisory Committees, however, was vague, with wording along the lines that it would be “widely drawn” and include the principal sectors relevant to each individual market, with representation from the retail sector, institutional brokers, custodians, market makers, registrars/receiving agents and the gilts market (Euroclear, 2002, p.37).

**SSE and what it means to be a cross-border central bank**

In addition to the transfer of securities outlined in the section on internal book-entry transfer, arrangements had to be put in place for the payment side of cross-border transactions. In all the Euroclear legacy settlement systems, whether directly through accounts held at the central bank or through settlement banks with an account at the central bank, payments for securities transactions were effected through the use of central bank payment systems.

To enable transacting parties within one central bank regime to make payment to those in another without requiring cash correspondent relationships to be established, Euroclear worked with the central banks of the jurisdictions covered by the integrated system in order to develop a mechanism for coordinating the transfer of cash between these markets through cross-central bank transfers. The approach chosen was that each central bank would act as a correspondent of the other central bank for the purpose of making central bank payments from one jurisdiction to another.

Despite work on the technical level around the setting up of the arrangements outlined above between the SSE development team and the central banks of the jurisdictions that the new
settlement system would span, the point of interface between the SSE and the Target (and later Target2) payments systems eventually became the most critical controversy regarding the integration initiative\(^1\).

At the centre of this controversy were the different models for the mechanisms that link the settlement system with the central banks and their payment systems. Most such mechanisms can be fitted, more or less, into two broad categories.

One is the ‘interfaced model’ in which there is a separation of the securities settlement system operated by the CSD and the payments system operated by the central bank. This requires coordination between the two system operators in order to provide DvP, as the cash records are operated exclusively by the payment systems of the relevant central banks.

The other is the ‘integrated model’ where the processing of both securities book entries and cash book entries takes place on the securities settlement system. This requires legal arrangements between the CSD and the central bank to ensure that finality of payment can be achieved within the CSD.

Because the ‘interfaced model’ required “managing dependencies on several external systems which creates delays and additional risks in a cross-border environment” (Interview D3), in order to establish links between central banks, the SSE had been designed on the basis of the ‘integrated model’. One of those involved in the design and development of the SSE explains the choice as follows:

“\textit{With the Banque de France system liquidity gets shoved over to the settlement system at the start of the day and settlement goes on, debits and credits, the account is actually outsourced to the settlement system. Then, two or three times a day, the result is posted back to the Banque de France so liquidity can be made available for other systems. ... The integrated model has the whole of the [central bank cash] account processed at the securities settlement system. So we looked at these two methods and we liked the Banque de France model more}”

\(^1\) TARGET and TARGET 2 are the inter-central bank payment systems developed for the Eurozone and operated by the European Central Bank following the launch of the Euro.
because it was more efficient. You have far less messaging between the central bank and the securities settlement system, therefore less can go wrong. You have the liquidity where you need it, which is on the [securities settlement system]. It is chundering through 600,000 transactions a day, market-wide, so that is where you need the information from the central bank.” (Interview D3)

This apparently technical decision came to be at the centre of an expanding controversy between Euroclear and the European Central Bank. A report from the cross-market market advisory committee, the XMAC, from November 2005 described the situation at the time as follows:

“The decision of the ... Governing Council of the European Central Bank (ECB) on whether to accept the model has again been deferred. Whilst it is known that some central banks [in the rest of the Eurozone] do not favour the proposed model, informal discussions have nonetheless been taking place at Governing Council level. A senior-level working group, comprised of payment systems’ senior figures, has been formed to consider the way forward. The prolonged uncertainty about the future of the integrated model is unhelpful but Euroclear has no option but to continue, considering that the proposed model is within the scope of existing ECB policy and Euroclear has already undertaken two years of development based on this published policy position. The Harmonisation team continues to meet with European central banks to address any issues, concerns or misconceptions that they might have about the integrated model.” (Cross-border Market Advisory Committee, 2005, p.1)

The controversy eventually became a full-scale conflict between two competing visions of how to integrate separate securities marketplaces and jurisdictions across Europe when the ECB announced on 7 July 2006 that it was “evaluating opportunities to provide settlement services for securities transactions” (European Central Bank, 2006). The ECB press release of
that day is quoted in full below because it outlines the key dimensions of the controversy, gives the public reasons for the decision of the European Central Bank to launch the development of a pan-European settlement system that would, in effect, render the original Euroclear single platform initiative surplus to requirements.

“Conscious of the need for further integration in market infrastructures, and extracting the benefits from the implementation of the TARGET2 payment system, the Eurosystem is evaluating opportunities to provide efficient settlement services for securities transactions in central bank money, leading to the processing of both securities and cash settlements on a single platform through common procedures. At its meeting on 6 July 2006, the Governing Council of the European Central Bank decided to further explore in cooperation with central securities depositories and other market participants, the setting up of a new service – which may be called TARGET2-Securities – for securities settlement in the euro area.

The objective of this project is to allow the harmonised settlement of securities transactions in euro which are settled in central bank money. Synergies for the market with other facilities operated by the Eurosystem will be sought, in particular in connection with the future TARGET2 payment system.

The implementation of such a facility, which would be fully owned and operated by the Eurosystem, would allow large cost savings as a result of the high level of technical harmonisation that this facility would entail for all market participants and would represent a major step towards a single Eurosystem interface with the market.

The Eurosystem will now consult central securities depositories and other market participants on the envisaged facility. A final decision on this project is expected by early 2007.” (European Central Bank, 2006)

Discussing the reasons for the rift with the ECB, the same interviewee who described the design decision to opt for the integrated payments mechanism for the SSE pointed to
concerns about the movement of large amount of cash liquidity in and out of the ECB inter-central bank payment system as a major reason for this development:

“The real issue (...) was really about how to use [cash] liquidity once it has been moved from A [Target 2] to B [SSE] (...) and may well have been one of the contributing factors to the whole TARGET2-Securities proposal. (...) We thought we would go for the integrated model because that was more efficient. That created a lot of ructions in the ECB where they essentially didn't agree with us that the integrated model was the most efficient way, and that began all the stuff that I am not going to go into.” (Interview D3)

The development of TARGET2-Securities (T2S) proposed in the above press release by the ECB would almost certainly mean that much of the investment into developing the Single Platform from Euroclear could be rendered obsolete. Not only the actuality, but even the potentiality, of T2S would be enough to increase the uncertainty of the investment to a degree that it would become unpalatable for many Euroclear shareholders and system participants to back it.

**Inter-controversy dynamics**

The tracing of controversies summarised in Table 2 and some of which were discussed above in more detail, what we see in how the controversies unfolded is the relations between the controversies identified and how these relations changed over time and in relation to each other. The controversies numbered 1, 2, and 3 soon started to become intertwined and entangled, first among themselves, and, later on, with other ones. At the same time, however, their outcomes and evolution was very much conditional on the resolution of a number of technical issues regarding how cross-market place book-entry transfer might or might not be achieved, and how the volumes of transactions that would result could be processed so that the economies of scale and scope that were expected were realised and around the distribution of which, these three controversies were premised.
What can be seen is that it is not just the resolution of isolated controversies that is important, but also the relations and dependencies between them. This, in turn, also made the sequence of their settlement important, as the settlement of one becomes a pre-requisite for another to either manifest itself or be resolved. In addition, the controversies often also relate to each other in a reciprocal way, with one changing the other and vice-versa. As one controversy was settled and a durable configuration of relations and positions of actants was established around it, the proposed marketplace gained durability and materiality, but at the same time came up against other existing market arrangements in a much more concrete and unavoidable way. Furthermore, as the materiality of the proposed new marketplace arrangement became greater, it was much more onerous to make changes or put in place alternative arrangements.

The example of the controversy over the choice of integrated versus interfaced model for the interaction with the central banks and the Eurozone payment system not only shows how an issue, or controversy, spreads out from a question of technical interfacing to a much broader debate about the terms of broader European financial integration, but also how a number of preceding smaller controversies coalesced around an issue. For example, it brought together the ECB and a number of the large custodians with a concentration of business across the marketplaces to be integrated who expected to see their competitive position suffer as a result. Many of these were also involved in the controversy around how the benefits of integration should be distributed and also engaged in the controversy around the ownership and governance of Euroclear as shareholders of the new entity. Furthermore, one of these custodians was also engaged as an advisor, shareholder, and banking services provider of one of the large European exchanges that was a competitor of Euronext that was seen as gaining from the proposed cross-border market integration initiative. This in turn brought into the controversy all the rival exchange operators to Euronext and, indirectly, the governments of the states where these exchanges were based through their representatives at the ECB.

**Explication and subjectivity**

In the two examples presented above, the interaction between the subjectivities of the agencies involved and the explication initiate by the introduction of the SSE was a key aspect of how the controversies unfolded.
In relation to the custodians and their disposition towards the proposed market (re)configuration, the introduction of the SSE provided a catalyst for, a) the division of the monolithic group of ‘custodians’ into two new groups we can describe as ‘custodians with predominantly intra-European cross-border custody business’ and ‘custodians with international business also offering services into Europe’, b) an attempt at linking different controversies in which they had a stake in order to defend their position, and c) a questioning of the long-term viability of their custody business, both at the collective/corporate level, but also among individuals involved in senior roles in their custody business.

The as the development of the SSE as it moved from proposal, to documentation, to functioning IT system, to new IT-enabled service about to be launched, acted as a motor and frame to these changing positions and self-perceptions. The initial Euroclear market integration plan was dismissed as an interesting idea that might not come to much (Interview G1); an internal IT integration project for the CSDs. As this idea gathered greater materiality and detailed technical proposals started to be produced by a dedicated project team and circulated to market participants for consultation, the ‘interesting idea’ started to exhibit much more significant consequences for this nascent (sub)group of market participants. The calculation of cost savings for cross-border transactions that would result from the new system (see Table 3) revealed concrete and troubling implications for the intra-European custodians and their fee-structures and business models. The differences in implications for the other sub-group with less ‘intra-European business quickly resulted in these two sub-groups starting to view themselves as distinct and with different issues, something re-enforced as they began to actively and publically campaign and lobby for or against the integration initiative through the Euroclear consultation process itself (BNP Paribas Securities Services, 2002)(Interview G1 and G2), but also in the media (Norman, 2007)(Finextra, 2004, Steele, 2004). It was through this decision to seek to resist the initiative, at least in the form it was starting to take, that linkages between controversies (see Table 2) began to be established, but also contradictions in the self-perceptions of these custodians also surfacing. So, for, example, while their custody business might suffer, they also stood to gain from the initiative as users/shareholders of the various CSDs brought together and the growth in liquidity and trading volumes the plans of Euroclear promised. The depth and liquidity of the proposed integrated marketplace also had benefits for their
trading and market making operations. Furthermore, one of the main members of this group also had contradictions to deal with as a result of being a major shareholder and advisor to a European exchange that was a direct rival to the Euronext group of exchanges that was seen as likely to benefit most from the market-funded development of a key technology for its operation, but also owned an ICSD that was a direct rival to Euroclear as an ICSD (Interview G2).

As the SSE took shape and moved into the development and testing stages, with a launch date communicated to market participants and workshops organised to familiarise market participants’ post-trade teams with the changes in operations this would result in, the inability to halt its progress led to a shift from media and thought-leadership opposition to a direct appeal to regulatory and public policy entities in order to highlight competition, systemic risk, and geopolitical implications of the initiative to the authorities concerned. At the same time, however, both at the personal level of individual senior executives as much as the corporate level there started setting-in an existential concern around whether their custody ‘model’ and custody business in general “might have had their day” and if there was still a viable and upwardly heading career path associated with this part of their organisation’s business (Interview G2). These self-doubts persisted even after the pyrrhic, for them, victory of the ECB announcement of the T2S system that would curtail the full commercial potential of the Euroclear integration initiative.

A slightly different trajectory of self-realisation and technological development was traced by the involvement of the European Central Bank with the initiative. The ECB was an entity with no clear existing role in the regulation and operation of securities marketplaces, unlike its national counterparts. The initial plan/proposal from Euroclear to develop a “domestic market for Europe” (domestic market for Europe), was a welcome attempt to create a single capital market for Europe, making the European single market as competitive and extensive as USA in the field of finance as much as production and trade. Even as the SSE took shape and moved from the consultation process to development and testing, the ECB interacted with the Euroclear project team at the technical level to develop and put into place the necessary interfaces for the crucial cross-border payments functionality via central bank money as described in the section “SSE and what it means to be a cross-border central bank”.

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It was as the SSE came closer to launch and the technical work in interfaces was nearing conclusion that the full scale of the movements of cash-liquidity in and out of the ECB Target2 payments system and unavailability - or limited availability - of that cash for other uses during trading became fully apparent. Combined with the lobbing of the intra-European custodians, both directly to the ECB board and the regulatory and oversight authorities of member-states that may have had most to lose from the success of the Euroclear integration initiative and targeting the systemic and competition implications of the initiative (Interview G1 & G2), a whole new and different realisation by the ECB of what a pan-European rather than national central bank/banking/financial services regulator should and could do, started to take shape around the “interface vs. integrate” controversy and how a securities marketplace relates to the inter-bank payment systems of central banks. It was out of this combination of realising the full extent that marketplace integration would impact the Eurozone payments system and the new or previously obscure systemic risks this might entail and made explicit by the technical interfacing work of the ECB staff and Euroclear SSE project team and highlighted together with the issues of unfair competition by the custodians, that the European Central Bank started to define what cross-border regulation and central banking should entail and how that then might relate to market and payment ITC systems. The ECB decision to develop a pan-European settlement system that would likely rival the one being developed by Euroclear represented a transformation of the view of the ECB of itself, from a provider of technical expertise and support on interfacing, to an arbitrator of systemic risk and operator of financial markets infrastructure.

**Discussion**

A key finding of the study beyond the two examples discussed in depth is that it is not sufficient when developing a new market to just establish a new ‘space’ or ‘scape’ within which circulations of objects of exchange, in this case securities, can take place (Appadurai, 1996, Hetherington, 1997). It is also important to reconcile the views of themselves of key actants with the positions and roles anticipated for them in this new transactional space. Common understandings have to be developed in this respect among the wide range of market participants identified so that the new roles proposed by the marketplace designers for
them are not only performed, but are also accepted as fitting with their own strategic outlooks (Hetherington, 1997).

In the initiative studied this involved contestations, both at the level of market politics, around the competitive positioning of market participants, as well as at the level of geopolitics and institutional politics relating to the competitive positioning of states, financial centres, and international institutions regarding their place in a future digital and globalised financial landscape. As the T2S intervention of the ECB shows in this study, the ICT functioning of the new settlement system may work perfectly, but, a flaw in a small component of its conceptualisation in terms of the key business, economic, political, and institutional assumptions that are inscribed – or are to be inscribed – into it (Akrich, 1992) may result in the whole no longer being viable in the form initially anticipated.

A new expanded marketplace therefore, is defined by a combination of a ‘space of circulation’, the boundaries of which are defined by the immutability of the objects circulating within that space along the connections linking transacting parties (Callon and Muniesa, 2005), but also through the establishment of a system of subjectivities within which a wide range of market participants and their views of themselves and their interests in the wider world are accommodated in the conceptualisation and materialisation of that space (Hetherington, 1997; McFall, 2014).

The insufficiency of seeing marketplace integration and financial globalisation as predominantly an ICT-enabled interconnecting of an expanded set of transacting parties points towards a role for ICTs beyond connectivity alone but one with important cognitive dimensions that enable the inspiration, planning, and foresight necessary for both developers and market participants to formulate their plans, strategies, and positions vis-à-vis the expanded marketplace arrangements. It is as part of this cognitive aspect of ICTs and the way the technological interconnection of an expanded set of market participants has to be supplemented by the establishment of a system of subjectivities within which a wide range of market participants and their views of themselves and their interests in the wider world are accommodated that the notion of explication is valuable.
As the putting in place of the SSE by Euroclear presented in our empirical account shows, the relatively easy assembling of key functioning parts of the new integrated marketplace that ICTs make possible without the need for the full solution to be in place, created the necessity for specific material rather than discursive responses from the world around it (Barry, 2002).

The development of the SSE illustrates how, as the controversies where the actants that have to be enrolled are predominantly technological and more directly controllable by the developers are settled, an initial tentative but concrete functioning entity such as the SSE gives the abstract conceptualisation of a common cross-border marketplace a durability and materiality. As a result, it starts to make concrete demands on the world around it and affects changes and transformations to that world.

Once in place, the SSE is no longer just a plan for a set of databases and algorithms running on very fast and powerful computers communicating through high-speed secure electronic data communications networks via a set of electronic messages with five existing legacy platforms and their databases. It has become instead a key junction linking together five already large pools of liquidity into one single aggregate pool comprising of “over 60% of the Eurotop 300 [equities], 52% of the domestic fixed income securities outstanding in Europe and, 62% of Eurobonds” (Euroclear, 2002, p.6) and, in the process, realising significant network effects and economies of scale that help to reinforce its durability. It becomes like a keystone, holding an entire structure together and increasingly difficult to remove or change.

This durability makes much more explicit and visible to those concerned the implications that the abstract concept of marketplace integration will have in concrete terms (e.g. the scale of transfers of cash liquidity in an out of the ECB’s Target 2 payment system).

This new entity of the SSE starts to set limits on possible events (Barry, 2002) and starts to make explicit its needs from, and consequences for, the world around it. It becomes a concrete interrogation of the existing world – both conceptual and material – surrounding the integration initiative (Barry, 2002). Seen in this way, points of interface between the emerging securities settlement system and other existing sociotechnical systems and networks are not only technical problems to be solved, but a nexus of actions, questions, and responses on the part of a range of agencies required to respond to the concrete demands and
implications of the new entity. It is through these responses generated by the materialisation engendered by the integrability of ICTs that new and often obscure aspects of an abstract proposed future state become knowable to these agencies (Muniesa, 2011, Muniesa and Linhardt, 2011).

**Conclusion**

Out of our analysis, we name a process ‘devising’ when we identify a set of historical events that revolve around the active creation and maintenance of clusters of humans, non-human devices and regulations that are at the core of such techno-political process of change.

The case presented identifies and analyses two interrelated processes of devising: one about the combination of five different market spaces into one and the other about making calculable the project to do so. Analytically, the first devising process is the one whereby the design and development of devices make financial exchange possible while the second is the process through which financial products are enabled to travel across the previous boundaries of their circulation. For this to happen, devices and practices relating to the marketplace design, therefore, also have to travel between previously different and discrete market sites and situations.

By studying this double ‘devising’ the article describes the way that through the concrete demands of the new IT-based cross-border settlement system, participants in the proposed new market architecture gain a clearer picture of the future market landscape within which they will have to operate and of their own position within that landscape. The framing of the choices they face both internally as an organisation and externally in the fields within which they operate and have to defend their existence is rendered more explicit by the concrete demands or implications of soon-to-be-operational components of the new system. As a result, new approaches to the judgement and valuation of opportunities, threats, risks, and strategic positioning have to be devised by those involved in the changing market architecture that challenge their subjectivities (e.g. in the case of the ECB: what does it mean to be a regulator of a cross-border market; who should, or could, be that regulator; what new systemic risks does the new market configuration present; or in the case of the European custodians: is the opportunity of the expanded market worth more than the loss of cross-
border custody business entailed for a large European provider of financial services; how much could a potential loss of tax revenues be for the states involved?).

The article thus provides insights as to how the technology involved relates to what gets quantified, calculated, judged and valued in the ‘devising’ of a new and expanded financial market, by whom, and for what purposes, but also how this relates to the reshaping among key market participants of the understanding of their own worth in this new market architecture. It thus argues that the relationship of explication and subjectivity is an important aspect of processes of ‘devising’ and one that may be of value beyond the study of markets in wider debates around the relations of technology and subjectivity (Sloterdijk, 2004, Foucault et al., 1988, Thrift, 2008, Law and Moser, 1999).

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