



MPIfG Discussion Paper 24/2

Dealing Government Bonds

Trading Infrastructures and Infrastructural Power in
European Markets for Public Debt

Arjen van der Heide



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Max-Planck-Institut für Gesellschaftsforschung, Köln

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Abstract

Confronted with increased difficulties to raise taxation, high inflation, and pressures to maintain social spending, many rich democracies have increasingly sought to raise funds in financial markets since the 1970s. Using the notion of “infrastructural power,” this paper examines the various ways in which states have become infrastructurally entangled with key actors in financial markets that provide the infrastructure of today’s markets for government bonds. Drawing on twenty-two interviews with debt managers and market participants, and documentary material, the article analyses the rise to prominence of MTS (Mercato dei Titoli di Stato), an electronic platform for trading government bonds that has become a key feature of Europe’s government bond market infrastructure. It traces the emergence of MTS in Italy, its rapid diffusion through Europe and its limited (or even non-existent) success in gaining market share in Germany and the UK. In so doing, this paper finds that some debt management units actively regulate their secondary bond markets to stimulate competition among dealer banks; they “orchestrate” the market for government bonds. Others take a more hands-off approach and only engage with secondary markets mostly as market participants by issuing debt instruments and perhaps buying and selling them in the secondary market. These differences are important for understanding the politics of sovereign debt: they reflect power relations, may impact states’ cost of borrowing and their capacity to withstand moments of fiscal stress.

Keywords: dealer banks, financial markets, government bonds, infrastructural power, public debt

Zusammenfassung

Unter dem Eindruck zunehmender Schwierigkeiten bei der Besteuerung, der Inflation und der Belastungen durch die Aufrechterhaltung der Sozialausgaben haben sich viele reiche Demokratien seit den 1970er-Jahren verstärkt darum bemüht, Kapital an den Finanzmärkten zu beschaffen. Ausgehend vom Begriff der „infrastrukturellen Macht“ untersucht dieses Papier verschiedene Formen struktureller Verbindungen zwischen Staaten und Schlüsselakteuren auf den Finanzmärkten, die die Infrastruktur der heutigen Märkte für Staatsanleihen bereitstellen. Auf der Grundlage von 22 Interviews mit Schuldenmanagern und Marktteilnehmern sowie Quellenmaterial analysiert der Beitrag die wachsende Bedeutung des MTS (Mercato dei Titoli di Stato), einer elektronischen Handelsplattform für Staatsanleihen, die im Laufe der Zeit zu einem zentralen Element der Infrastruktur des europäischen Marktes für Staatsanleihen geworden ist. Er zeichnet die Entwicklung des MTS in Italien, seine schnelle Verbreitung in Europa und seinen mäßigen (oder sogar nicht vorhandenen) Erfolg bei der Sicherung von Marktanteilen in Deutschland und Großbritannien nach. Im Ergebnis zeigt sich, dass einige Schuldenmanagement-Agenturen ihre Sekundärmärkte für Anleihen aktiv regulieren, um Anreize für den Wettbewerb zwischen Händlerbanken zu schaffen; sie „manipulieren“ den Markt für Staatsanleihen. Andere verfolgen einen eher passiven Ansatz und treten auf den Sekundärmärkten hauptsächlich nur als Marktteilnehmer in Aktion, indem sie Schuldtitel ausgeben und möglicherweise auf dem Sekundärmarkt kaufen und verkaufen. Diese Unterschiede sind für das Verständnis der Staatsschulden-Politik von entscheidender Bedeutung: Sie spiegeln Machtverhältnisse wider und wirken sich gegebenenfalls auf die Kosten der Kreditaufnahme durch Staaten und deren Widerstandsfähigkeit gegenüber haushaltspolitischen Herausforderungen aus.

Schlagwörter: Finanzmärkte, Händlerbanken, Infrastrukturelle Macht, Staatsanleihen, Staatsverschuldung

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Dealing Government Bonds: Trading Infrastructures and Infrastructural Power in European Markets for Public Debt

1 Introduction

Since the 1970s, many rich democracies have sought to reorder their public debt. Confronted with increased difficulties to raise taxation, while also facing significant pressure to maintain social spending, these states increasingly sought to raise funds in financial markets (Barta 2018; Streeck 2014). In so doing, many of these rich democracies also typically sought to reform the market for their public debt. A common trend has been the adoption of a more market friendly approach, which typically involves the setting up of an independent public debt management agency, the increased issuance of marketable debt, the setting up of a primary dealer system, and the increased use of financial derivatives (Fastenrath, Schwan, and Trampusch 2017; Lemoine 2016, 2017). Regardless of partisan backing, European states have adopted these practices, which scholars have come to describe as the “financialization of public debt management” (Fastenrath, Schwan, and Trampusch 2017; Preunkert 2017; Rommerskirchen and Van der Heide 2023; Trampusch 2015).

While the overall trend toward a form of financialized debt management has by now been well documented, what is less well understood is how the relation between states and their financial backers shaped and is shaped by the concrete material infrastructures through which the trading is done. In most economic theory, markets are very often understood as abstract spaces in which demand and supply meet to find a market price. But as economic sociologists have suggested, understanding markets as abstract entities means “depriving oneself of the explanatory key required to describe the mechanisms of aggregation and their effects” (Callon and Muniesa 2005, 1240). A similar abstract understanding of markets can be found in markets for public debt. In most economic theory, states are typically understood to operate in an abstract global market place, where aggregate supply and demand are detached from materiality. In social studies of finance, scholars have, however, shown how the abstract seeming market supply and demand are effects of global microstructures, which are themselves very much rooted in material routines and practices that shape and define trading patterns and that are constitutive of the power of finance (e.g., Knorr Cetina 2004; Knorr-Cetina and Bruegger 2002; MacKenzie 2009).

This paper examines the financialization of Europe’s government bond markets by focusing on their concrete material organization along the lines of the social studies of finance (MacKenzie 2009). Recent episodes of financial instability suggest that such a view may have its merits in understanding the dynamics of power in financial markets. In March 2020, for instance, when many countries went into lockdown, the US market

for Treasurys appeared dysfunctional. While many expected a flight to safety, which would cause an upsurge in the price of Treasurys, the price of Treasurys rather dropped. Some bond market dealers even stopped quoting prices altogether. The Treasury market, a trader was quoted as saying, was “just not functioning ... it is freaking people out” (Samson et al. 2020). Fears also rattled Europe’s bond markets in 2018, when large swings in the price of Italian government bonds caused concern for Europe’s financial system more broadly (Stafford and Allen 2018). As in the US case, and unlike previous episodes of instability, the problems in the Italian government bond market were linked to an issue of market structure and reduced liquidity on the market’s interdealer segment, which is organized on the platform MTS (Mercato dei Titoli di Stato). MTS had been a central actor in the remaking of Europe’s bond markets in the 1990s and the first decade of the twenty-first century. The company originated as a joint venture by the Italian Treasury and Central Bank in the late 1980s and gained ground in the Italian home market. After privatization, MTS quickly became a central cog in Europe’s markets for public debt, which had just seen the emergence of the eurozone pushing sovereigns to compete with one another for the favor of bond investors. In Germany, however, the success of MTS remained rather limited; and in the UK, the company never gained ground. Once the new electronic routines and practices of sovereign debt trading had bedded down, moreover, most sovereigns opened up their bond markets to other competitors too, which resulted in a loosely integrated network of communication technologies, both digital and non-digital, and is characterized by distinct clusters of rules and practices around the trading of different sovereigns’ government bonds. Though all European states now rely on a bifurcated market structure, which consists of an interdealer market and a so-called dealer-to-customer market, there’s still quite some leeway in the rules of the game within these dealer-dominated market structures.

The purpose of this paper is to describe the rise of MTS as a central piece of technology in Europe’s bond markets and to explain its differentiated uptake across countries. One possible explanatory factor for these differences could be that states have quite some influence on how their public debt is traded because they can act simultaneously as both issuer and regulator. Differences in trading practice could therefore be an expression of ideological differences, with some states taking a more active role as regulator, while others adopt a more *laissez-faire* approach; or they could be an expression of different levels of state capacity, with debt-stressed states engaging in more interventionist infrastructural work to pin down dealers to their role as market makers. Another explanation, however, could be that differences in trading practice are rather an expression of different levels of infrastructural power held by dealer banks (Braun 2020; Pinzur 2021). The more indebted states are and the more uncertainty they face regarding capital market access, the more dealer banks will enjoy some degree of infrastructural power, suggesting that they can assert their preferences on market practice. This would imply that sovereigns facing the least uncertainty about their capacity to leverage financial market funds adopt a more regulated approach, while the most stressed sovereigns follow a more *laissez-faire* style of regulation of market practice. MTS, in this view, could then be a conduit for dealers to assert their preferences on the rules of the game.

I argue that three periods can be distinguished in the history of MTS, in which different factors became important. The first period is the pre-eurozone period, in which Europe's markets for sovereign debt began to open up increasingly to international investors, but in which market integration was limited by the existence of multiple currencies. In this period, sovereigns faced idiosyncratic concerns, which translated into different approaches to market organization. Differences in approaches were sometimes linked to ideological differences and sometimes to differences in existing state-finance relations. While both Italian and British governments perceived their bond markets to malfunction and sought to remedy this by overhauling their respective government bond markets, they nonetheless adopted different strategies for doing so.

The second period saw the introduction of the euro in the eurozone. Sovereigns then had to compete with one another for the favor of investors and by extension dealer banks, who formed part of the infrastructure of government bond markets. This created a situation in which the capacity of states to assert their preferences on bond markets declined, and uncertainty about states' access to capital markets increased. The second period was as a result characterized by isomorphic pressures on euro area governments to adopt similar strategies and practices, thus partly induced by the infrastructural power of dealer banks, who came to organize the competition among states.

The third period finally saw the weakening of these isomorphic pressures, as the debt hierarchy between governments became settled, and new technological developments alleviated concerns about market fragmentation. Dealers now developed pricing engines, which enabled them to trade on multiple platforms at once, both in the interdealer market as well as the client-to-dealer segment. As a result, most sovereigns – though not the Italian government – opened up competition for providers of trade infrastructure to compete with MTS. The result of this phased evolution of Europe's government bond markets is a loosely integrated network of investors, dealer banks, trading platforms, and information infrastructure, which may give the impression of an integrated market for European government bonds, but which is also characterized by distinct clusters of trading practices organized around the national debt of individual member states. This outcome may help explain why in times of stress global financial markets may appear more locally rooted than they initially seemed (see, e.g., Stadheim 2021).

To make this argument, the paper proceeds as follows: In the next section, I first examine the broader developments across countries that some authors have described as the financialization of public debt management. I then describe the logic of the study's design, and then proceed with the analysis of the “nested” case study, following the three stages outlined above.

2 Reordering public debt

In 1980s Europe, markets for public debt were still primarily a domestic affair (Preunkert 2020a). From the Second World War to the 1970s, most debt was issued in the form of non-marketable instruments. States would borrow most of the money directly from captive investors, including central banks, who would hold onto these securities until maturity (Abbas et al. 2014). Marketable securities were sold mostly on domestic exchanges or in “over-the-counter” markets run by local dealer banks and brokers. Sovereign issuers would typically also sell a small share of their debt in the form of marketable securities to foreign investors on the London Stock Exchange, but this share was oftentimes negligible.

Despite the commonalities, domestic arrangements varied in terms of organization and ownership. Kapadia and Lemoine (2020) describe French debt management in this period, for instance, as a form of “debt dirigisme”: an approach to debt management couched “in political authority and administrative rules and control” (see also Lemoine 2016) that relied on the so-called “Treasury circuit” – a Treasury controlled “network of savers ... composed of deposit accounts of households, civil servants or other citizens who use the French Treasury as a bank ... but also public banks and institutions that had to deposit a certain percentage of their cash flows on the Treasury account at the central bank” (Kapadia and Lemoine 2020, 381). The Italian approach relied mostly on retail investors and direct monetary financing - in 1976, the Italian Central Bank owned more than 43 percent of total public sector debt (Spaventa 1988, 11). The Dutch government relied heavily on captive pension funds to sustain its public debt, with a special role for the large pension fund for public employees, ABP, which was required to assume much of the government’s debt in non-marketable form (Van der Zwan 2017, 573). The German government debt was managed by the Bundesbank, which followed a “conservative, passive and long-term strategy” (Trampusch 2015, 121). In all these countries, markets for government bonds did exist in the exchange and over-the-counter forms, but only a relatively small volume of public debt was traded there.

By the 1990s, however, most states had changed their public debt management approach – a development that some have described as the financialization of public debt management (Fastenrath, Schwan, and Trampusch 2017; Lagna 2016; Lemoine 2016; Preunkert 2017; Trampusch 2015). The financialization of public debt management entailed two types of changes: changes in the relation between states and private investors, as well as changes in the regulatory framework governing the behavior of market participants (Preunkert 2017). On the one hand, states have increasingly moved away from financing their spending by borrowing from captive domestic investors, issuing their debt on (international) financial markets instead. On the other hand, states have started taking a more liberal approach to financial regulation, increasingly refraining from direct interventions in financial markets. These changes have generally been accompanied by debt management reforms, which have placed responsibility for public debt management into the hands of independent debt management agencies or departments (Fastenrath, Schwan, and Trampusch 2017).

One consequence of the financialization of public debt is that states must secure continued access to capital markets. To secure access to capital markets, most states have set up primary dealer systems, consisting of large dealer banks that commit to participation in government bond auctions and to operate as “market makers” in the secondary market for government bonds in exchange for privileged access to these auctions and to other business commissioned by governments (Lemoine 2013; MacKenzie et al. 2020; Preunkert 2020b). As a result, debt managers maintain close ties to dealer banks not only through formalized primary dealer systems but also through “revolving doors”: about half of public debt managers had a prior career at one of the dealer banks and nearly half of public debt managers have taken up a position at one of the dealer banks after their public appointment (Silano 2022). Beyond primary dealers, public debt managers may also seek actively to engage private investors, for instance by partaking in “roadshows,” where they pitch public debt as a business proposition to international investor audiences (Rato 2020).

Beyond such commonalities, there are also clear differences in how this transition toward a market-based system has panned out for different states. Even if the language of a “market-based” approach might give the impression that demand for public debt securities is primarily determined by assessments of creditworthiness, there are in practice many other factors influencing it. Notably, for instance, government debt securities are the single most important source of the “high quality” collateral banks need to access cheap funding in money markets and to access the credit facilities of central banks (Boy 2014; Gabor and Ban 2016). They are the backbone of contemporary market-based financial systems, which also ensures steady demand for at least the most highly rated among them (the treatment of government bonds as collateral depends on credit ratings). Government bonds, moreover, are generally treated as “risk-free” assets – even if they still might carry some risk – and tend to enjoy privileged treatment in capital regulation (Gabor 2016; Neyer and Sterzel 2018). Government bonds are therefore not only valued as investment propositions but also as risk-free assets that may be used as collateral in money markets for short-term borrowing. The “safest” assets are most in demand, creating a hierarchy among eurozone sovereigns, with German public debt at the top and the rest following at some distance determined by various factors (Preunkert 2020a).

What is still little understood, however, is how changes in the relation between sovereign issuers, their dealer banks, and investors are reflected in the concrete infrastructures constituting these markets. Crucial here is that most markets for government bonds have moved “off exchange” and are increasingly organized around electronic trading platforms. As some scholars have shown, the emergence of new digital technologies in the financial sector may give rise to struggles over the design of market infrastructures, the social scripts deemed as legitimate behavior, and the rules of the game more generally (Abolafia 1996; MacKenzie 2021; Pardo-Guerra 2019; Zaloom 2006). Considering that the constellation of actors, their interests, and their resources tends to differ across markets, the “politics of market structure” (MacKenzie et al. 2020) also tends to produce different outcomes, with some markets for instance now dominated by newly es-

established high-frequency traders, while other markets remain intermediated by dealers conducting most of their business over the phone. If we are to understand how states are imbricated with global capital, we must therefore examine how the concrete material infrastructures of markets in public debt have evolved with the onset of electronic trading.

3 Studying the history of MTS as a nested case study

The paper presents a historical account of the introduction and diffusion of the trading platform MTS as a way to examine the evolution of Europe's government bond markets more generally. The strategy for the analysis can perhaps best be described as a nested case study, in which the European market for sovereign debt is the main object of our analysis, but which also involves the analysis of individual country trajectories within the overarching story. This nested structure is the result of the very loosely integrated nature of Europe's bond markets, which is the outcome this paper aims to explain. Within this setup, the story of MTS serves as a tracer dye that allows us to probe the factors and path-dependent trajectories of different countries that have shaped the diffusion of MTS. Specific attention is given to the uptake (or lack thereof) of MTS in Italy, Germany, and the UK. Within the larger setup of the study, these cases were selected because they run some of the largest public debts in Europe and, within that grouping, exhibit the widest variety in terms of how their markets are run. This means less attention is paid to other possible countries, most notably some of the smaller states, such as Slovakia, which joined the eurozone at a later date and adopted the MTS model more recently. Within the overarching case study, the sub-cases nonetheless serve as "diverse" cases of European states with relatively sizable – in absolute terms – public debts (Gerling and Cojocaru 2016) that allow us to cover the most typical cases within the broader subset of Europe's largest government bond markets.

The analysis distinguishes between three phases in which, I argue, different factors became important in shaping the socio-technical trajectories of Europe's government bond markets. The first phase is the period leading up to the implementation of the eurozone, covering the 1980s and 1990s, which for most European states saw a period of fiscal consolidation and an attempt to move away from monetary financing, which was seen as inflationary. Within this context, MTS emerged as a joint initiative by the Italian Treasury and Central Bank to remake the secondary market for its sovereign debt, with the aim of making Italian public debt more attractive to foreign investors and dealer banks. The second period covers the introduction and implementation of the eurozone in the late 1990s and at the start of the new millennium and assesses the factors that shaped the diffusion of MTS through Europe. In this section, I also delve more deeply into the trajectories of Germany and the UK, which tells us something about the limits of the isomorphic pressures exhibited by the diffusion of MTS. Finally, the third phase covers the period from the early years of the twenty-first century onwards, which

saw the consolidation in the European debt hierarchy and a settling down of the new clusters of trading practices in European sovereign bonds.

In the analysis, I draw on two sets of sources. The first consists of twenty-two semi-structured interviews with debt managers, (primary) dealers, and executives and employees of trading platforms. The second set consists of documents, including newspaper articles, policy papers, and documents published by debt management organizations. The practitioners and debt managers who were interviewed were active mostly (though not exclusively) in the German, Italian, and British markets for sovereign debt, and provide the basis for the more extensive engagement with the trajectories of these countries. The documentary sources covered a broader range and also dealt with the introduction of MTS in other countries in Europe, which enabled a wider scope on the evolution of Europe's government bond markets.

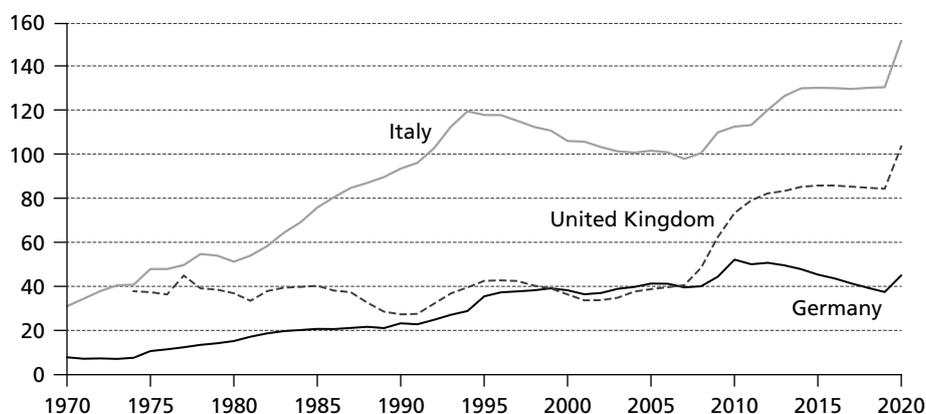
4 MTS and the remaking of Europe's bond markets

The process which has been described as the financialization of public debt management began in earnest in the (late) 1980s, when the first governments in Europe initiated public debt reforms (Fastenrath, Schwan, and Trampusch 2017; Lemoine 2013; Preunkert 2017; Rommerskirchen and Van der Heide 2023; Trampusch 2015). Not coincidentally, this is also the period in which the history of MTS starts. In the 1980s, most government bond markets were still organized partly "on exchange" and partly as an "over-the-counter market." This setup enabled governments to access capital markets, though access was typically wavering and often came at a rather high cost. Monetary financing was therefore still common practice in many countries, which alleviated the need to maintain market access at all times. Central banks, after all, could assume the government's debt when market conditions were seen as unfavorable. As governments increasingly battled with inflation from the 1970s onwards, however, monetary financing became increasingly seen as bad macroeconomic policy, pushing states to improve capital market access. MTS played a big role in this, first in Italy, later also elsewhere. What follows is an analysis of the role MTS came to play in Europe's bond markets in three phases.

Phase 1: MTS and the Italian bond market model

The Italian government has had a troubled history with public debt, which it rapidly accumulated in the 1970s and 1980s before commencing a period of tough consolidation in the 1990s and the early years of the twenty-first century (see Figure 1). As noted earlier, the Italian government financed a large chunk of this debt through monetary financing but began to look for alternatives in the 1980s. This was complicated, however,

Figure 1 Debt/GDP ratios



Source of data: IMF Global Debt Database.

by a poorly functioning market for government bonds. As one interviewee remembers, there were “very frequent blackouts ... where prices were as a matter of fact quite non-existent”; the voice-brokered “price discovery approach” on which the market relied to a large degree was increasingly perceived as “quite problematic” (Interviewee QR). As the 1987 stock market crash unfolded, for instance, there was “a complete blackout of the government bond market ... No one really knew where the real price was” (Interviewee QR). This was problematic not only for governments who wanted to issue new debt instruments in the market but also for market actors who increasingly relied on government bonds as a reference asset for valuing other assets and as a source of collateral for borrowing in the eurodollar market (Boy 2014; Gabor and Ban 2016).

Within this context, Italian officials perceived a need to improve the transparency and liquidity of its public debt market infrastructure. A first step was to digitize the secondary market by setting up an electronic platform: MTS (Interviewees QH and HN). Initially, access to MTS was relatively unrestricted – it included about 300 “dealers,” including “banks, securities firms ... insurance companies, brokers and corporations” (Anonymous 1995). Some dealers agreed to operate as market makers and in exchange acquired the status of “primary dealer”; others participated in the market as “market takers” buying and selling bonds at the available prices. Trading volumes remained limited, but the Treasury’s efforts in renovating the infrastructure signaled to foreign investors the government’s willingness to reform its public debt market.

Secondly, the Italian Treasury formalized its primary dealer system and sought to increase market makers’ commitment. Following the 1988 reforms, bond market difficulties persisted, epitomized by the 1992 currency crisis. Foreign investors abruptly pulled their money from Italy, causing a steep rise in short-term interest rates from 12 percent to 18 percent, which, because of the short average maturity, wreaked havoc on Italy’s

debt servicing costs (Rossi 2010). In the midst of the political turmoil of the early 1990s, the Director General of the Treasury – Mario Draghi – had initiated “a deep investigation of what could be a more solid system” (Interviewee QH) and pushed for a number of reforms intended to improve the workings of the hitherto ill-functioning interdealer market. As one interviewee remembers, for instance, “there was at that time a stamp tax on the transactions on MTS [which] was not present for transactions conducted via London” (Interviewee QH).

The Treasury also streamlined the primary dealer system. It turned MTS into a two-tiered market with three types of participants: dealers, primary dealers, and “specialists” (Sundararajan, Dattels, and Blommestein 1997). Specialists and primary dealers enjoyed privileged access to primary auctions and repo facilities offered by the central bank, committing in exchange to predefined market shares in both primary and secondary markets and mandatory quoting obligations. The behavior of specialists, moreover, would be monitored on the secondary market platform. Dealers, in contrast, remained “market takers” and could not access the auctions directly, having to buy bonds from other market participants instead.

Initially, MTS was built on the price streaming infrastructure of Reuters, which also maintained the system. Now, however, the Italian Treasury and Central Bank developed a distinct infrastructure, separate from the Reuters system. A major advantage of this system was that it enabled “straight through processing.” Previously, trades executed over the phone (or on the older MTS platform, which ran on the Reuters system) had to be entered onto “paper tickets” and were then cleared and settled by back office employees; MTS (and, as discussed below, other platforms as well) automated these processes by establishing a common communication standard linking banks’ administrative infrastructure with the Central Securities Depositories registering the ownership of the securities and granting the platform the “power of attorney” to arrange settlement (Interviewee JY). As another interviewee noted, “there was a big push to reuse that same infrastructure ... for efficiently booking voice tickets as well” (Interviewee WY). Even if traders preferred to execute trades over the phone, the trades could still be cleared and settled automatically when entered into the electronic system.

From 1994 onwards, interdealer trading increasingly took place on MTS. This also meant that Treasury officials had access to a system allowing them to impose and monitor secondary market quoting obligations. As a former trader at a large American “specialist” bank remembers, “we were strictly monitored by the authorities, with monthly reports, with the head of the trading desk to be in close contact with the authorities making sure that in addition to the auction we were fulfilling all our obligations” (Interviewee JY). The arrangement, moreover, solidified the boundary between insiders (mostly specialists and primary dealers), who enjoyed access to MTS, and outsiders or “clients” – the end investors who were to buy and sell government bonds to and from dealer banks. The importance of the relations between dealers and their customers, which were managed by dealer banks’ sales teams, remained virtually unchanged. What did change, however, was

how the reputation of dealer banks was established, as the Treasury now could publish rankings of market makers.

By 1994, then, the basic infrastructural features of Italy's bond market were in place. First, the market was structured around an increasingly select group of primary dealers (and specialists), who had privileged access to primary auctions, syndication deals, and repo facilities. Second, the infrastructural entanglement of the primary dealer banks and the state helped solidify the position of large dealer banks as central actors within a bifurcated government bond market, composed of an interdealer and a dealer-to-client segment. Third, the interdealer market was electronic, enabled automatic execution of trades, and was quote-driven. It also enabled the enforcement of mandatory quoting requirements within predefined spreads and the close monitoring of dealers' market making performance.

Toward the late 1990s, MTS was widely perceived as a success. Officials at the Italian Treasury, for instance, noted that "the system showed more and more resilient," even when faced with another financial crisis in early 1995. After an initial increase in interest rates of over 1 percent, they came down to the previous level of 11 percent within a couple of months. "And also, the regularity of quoting in the secondary market was not compromised" (Interviewee QH).

Phase 2: MTS going to Europe

The Italian government wasn't the first to restructure the public debt market. The French Treasury had already started running a licensed primary dealer system in 1987, organized around so-called *Spécialistes en valeur du Trésor*. The market-oriented reforms "were conceived by liberal reformers in the 1960s and '70s as a way of bringing the state out of its monetary illusion and the ease with which the Treasury tapped savings in the postwar *dirigiste* years" (Lemoine 2013, 5). Other European countries had also set up primary dealer systems, some relatively early (the UK was the first to do so in 1986, Spain in 1988, Sweden and Austria in 1989, Belgium in 1991, and Finland in 1992), others only much later (e.g., Portugal in 1998, the Netherlands in 1999, and Denmark as late as 2003).

An important catalyst for increased engagement with infrastructural coordination was the prospect of further monetary and financial integration and eventually the onset of the eurozone. By removing the currency risk for European investors, and thus weakening the ties between the sovereign and its domestic investor base, the eurozone introduced an element of competition among sovereign issuers (Preunkert 2020a). Countries with no shortage of domestic savings feared these savings would flow out of the country, reducing domestic demand for public debt securities. When MTS was privatized in 1998, it could thus capitalize on states' positional uncertainty and quickly expand its infrastructural services across the euro area.

MTS pursued a two-pronged strategy. MTS first set up a pan-European platform, EuroMTS. This would enable the largest dealers to buy and sell so-called “benchmark” bonds (a selected range of especially “liquid” bonds) of different sovereigns on a single platform. MTS appointed Alexandre Lamfalussy, who is sometimes credited as the architect of the euro, as the chair of EuroMTS, signaling the company’s aspirations. Second, MTS then also set up local platforms across the eurozone, which would be co-owned by MTS, local dealers, and debt managers. As a result, MTS had a two-tiered structure: local dealer communities traded on local platforms co-owned and controlled by national Treasuries and dealer banks; international primary dealers could in addition trade benchmark bonds on EuroMTS. These platforms were then integrated into a single “matching engine,” connecting local dealer communities to the liquidity pools of large international primary dealers. MTS thus provided the infrastructure, which facilitated competition among sovereign issuers.

Interviewee KL, who worked for MTS at the time of its European expansion, explained that MTS provided a solution to the “different needs” of both sovereigns and banks.

On one end, there was a need of government issuers in Europe to maintain control of their own markets. There was a need of the same issuer to have their market more liquid and more international as possible, in order to compete with the other countries in issuance. And on the side of the bank, there was the need of creating an economy of scale, to have a central system where they can have access to all European markets. And at the same time, to try to impose to the issuer some discipline in the issuance policy. (Interviewee KL)

The Italian bond market model, for which MTS provided readymade infrastructure, enhanced the capacity of both debt managers and dealers, but it also constrained them in other ways. For banks, MTS provided an integrated system on which they could trade not only government bonds but also repos. Being part of the infrastructure as primary dealer, moreover, was indispensable for the largest dealer banks. Considering the central role of government bonds in contemporary financial systems, not selling European government bonds “would be,” in the words of JP Morgan’s CEO Jamie Dimon, “like running a store that doesn’t sell bread or milk” (Lee 2019). An often-heard complaint among primary dealers is that market making itself is not a terribly profitable activity (e.g., Dunne, Moore, and Portes 2006). There are, however, various reasons why banks nonetheless may want primary dealership. First, trade in government bonds may attract customers for other more expensive and specialized products such as derivatives. Second, debt management organizations also reward the most active primary dealers with contracts that come with hefty fees, including issuance of government debt through syndication. Third, having a large presence in the government bond market allows dealers to get a “sense of relevant flows,” which “was essential for positioning on your back book” (Interviewee QR).

For sovereign issuers, the MTS model provided access to international capital, while governments could retain some degree of control over the domestic bond market. Accessing international capital, however, required issuers to “streamline” their issuance

strategy. EuroMTS allowed countries to list no more than two bonds per “maturity bucket,” the issuance of which had to exceed €5bn. These benchmark criteria were decided without input from sovereign issuers “because the idea was, this was to be a decision that was market driven” (Interviewee KL). Dealers tend to prefer issuance in a limited range of instruments because this increases liquidity. Debt managers, however, prefer having access to a wider range of instruments and maturities so they can raise funds as and when they need them. The relatively stringent criteria of the benchmark bonds pushed issuers to concentrate their issuance in a small number of bonds and to use derivatives like swaps to manage cash flow across time.

The first to set up the MTS model locally outside Italy were the Dutch. With the onset of the eurozone, Dutch Treasury officials observed an “increasingly large investor demand for Southern European government bonds. ... The outflow from the Netherlands was enormous” (Interviewee IB). The simultaneous loosening of pension funds’ investment mandates, moreover, further opened the gates for capital to flow out of the country. “When you see €12bn capital outflow in the monthly balances of the Dutch central bank, you have got to do something to secure your competitive position in the sales of government bonds” (Interviewee IB; author’s translation). In response, the Dutch State Treasury Agency adopted the Italian market model by implementing a primary dealer system, limiting issuance to a small number of “benchmark bonds,” and monitoring primary dealers’ quoting obligations on MTS.

After setting up MTS Amsterdam, other platforms quickly followed suit, starting with France, Belgium, Portugal, Spain, Germany, and then others (Interviewees JY and EU). In some cases, MTS encountered competition from local platforms backed by local dealers. MTS Spain, for instance, was only authorized after political intervention (Interviewee KL). By the middle of the first decade in the twenty-first century, then, MTS had become an established feature of government bond markets across the eurozone. It was “almost part of the European *acquis* [the body of rights and obligations of EU member states]: if you became part of the Euro, in particular, you had to have your MTS market, because that gave you not only bond trading but ... also ... repos [the capacity to buy bonds with loans collateralized with those bonds] which were critical for the money markets” (MacKenzie et al. 2020, 17).

Within this market structure, debt managers tend to see themselves as “market managers” (Interviewee IB), who wield significant power but lack the capacity to coerce market participants into buying debt. A primary dealership must be attractive enough for foreign banks to open up primary dealerships. At the same time, debt managers also want to reduce borrowing costs by driving up competition among primary dealers. As I will argue in the next section, how this balance of power plays out in practice varies across countries.

The UK: Gilt-Edged Market Makers getting their way

The British government was the first in Europe to overhaul the government bond market infrastructure. In the 1980s, the UK government already issued a significant share of its debt in marketable form, but it experienced increased difficulties with its “single capacity” market structure (Dutta 2018), structured around jobbers (acting as market makers) and brokers (finding buyers and sellers to trade with the jobbers). The subsequent Big Bang reforms of 1986 restructured the bond market around so-called Gilt-Edged Market Makers (GEMMs and interdealer brokers. The GEMMs would commit to participating in primary auctions and market making; in exchange, they would have privileged access to auctions and repo facilities. Debt managers, moreover, would rank GEMMs market making performance and reward those performing well with participation in syndication deals, amounting to between 10 percent and 25 percent of the total debt issued. The interdealer brokers would then organize an interdealer market where GEMMs could manage their inventory and offload positions by trading with each other.

Initially, the new gilt market operated as a voice-brokered market. Observing the rise of electronic trading, however, the UK’s Debt Management Office started examining the implications of this for the infrastructure of its secondary gilt market by the late 1990s. In a consultation paper, the UK DMO (2000b) proposed four different options. The first option was to leave the market’s phone-based infrastructure unchanged. GEMMs would continue to supply quotes to their clients on demand for selected gilt issues. The second option was to require GEMMs to stream (firm) prices to a centralized quoting system, which could be accessed by all market participants. Similar to the first option, this option would involve mandatory quoting for a selected range of gilts, the difference being that the requirement could be more easily accessed and monitored. The third option was to create an inter-GEMM market located “on screen.” This option would require GEMMs continuously to stream prices to each other through interdealer brokerage screens. The fourth and final option was to “establish a two-tier market, similar to the Italian domestic market for government bonds” (UK Debt Management Office 2000b, 13). This model would be similar to the third option but would also expand access to a wider group of dealers beyond the GEMMs (the second “tier”) and possibly involve automated execution.

The option most favored by the GEMMs was the third option of an electronic inter-GEMM market, which maintained a strict separation between the GEMMs and other market participants. Concerning the first two options, GEMMs feared that if smaller dealers and clients would have access to alternative trading venues (such as BrokerTec and espeed), their role would be diminished to “the liquidity supplier of last resort,” exposing “them to too much market risk” (UK Debt Management Office 2000a, 10). The “Italian model” received “only muted enthusiasm.” While some believed that a two-tiered market could be “beneficial in a ‘mature market’” or would even be “inevitable,” others “believed that this [model] would devalue the GEMMs’ franchise and would lead to the withdrawal of some GEMMs from the market” (UK Debt Management Office 2000a, 6).

The UK DMO followed the GEMMs' preferred approach, and required GEMMs to stream two-way quotes only to each other continuously, anonymously, and for a selected range of bonds. These prices had to be "firm" (that is, immediately executable) up to a certain trade size. Rather than designating a preferred screen, the DMO allowed GEMMs to fulfill their quoting obligations on any of the screens of the three interdealer brokers.

How then can the absence of MTS in the gilt market be explained? First, the UK did not become part of the eurozone and debt managers therefore faced no uncertainty about their standing within the competitive space of the euro area. The isomorphic pressure that pushed euro area countries to adopt the MTS model, was thus absent in the UK. Second, the Big Bang reforms had already created a close-knit group of primary dealers (GEMMs) with a strong identity distinct from other dealers, which allowed for the formulation of shared interests. Prior to the introduction of electronic trading, moreover, there was already a degree of infrastructural coordination between the DMO and the GEMMs. For instance, the DMO would consult on a regular basis with the GEMMs about its operations in the gilt market. This enabled GEMMs (but not non-GEMM dealers) to influence DMO decisions through the consultation process. Indeed, GEMMs played an active role in the working group that decided on the structure of the secondary market. Combined, these factors meant the GEMMs could effectively bar non-GEMM dealers and clients from accessing "insider" quotes.

Germany: Marktpflege, futures, and the Bund Bietergruppe

The German public debt market is a remarkable exception in Europe: it doesn't operate a real primary dealer system like the other countries do. Since the 1950s, the Bundesbank issued public debt mostly through syndication deals and occasionally through actions via the Federal Bond Consortium. *Euromoney*, moreover, described the Bundesbank's approach to debt management as encouraging a "culture of fear," as they allegedly pressured banks into taking bonds at low rates. In 1997, however, the Bundesbank replaced this consortium with the *Bund Bietergruppe* (Bund Issues Auction Group), which differed from other primary dealer systems in the sense that there were no market making obligations and the minimum threshold for participation in primary auctions was much lower, resulting in a much less exclusive group of participating dealers. The Bundesbank, it was reported, was "unwilling to burden itself with a system to police the primary dealers, checking each maintains the required bid-offer spreads at the required times and preventing dealers from engaging in arbitrage at the issuers' expense" (Anonymous 1997).

One way in which the government did influence the secondary market structure was through the idiosyncratic practice of *marktpflege*, a practice established by the Bundesbank and later inherited by the German Finance Agency (Finanzagentur). At every auction, the Bundesbank (and later the Finanzagentur) would retain a share of the bonds issued, which it would then sell directly in the secondary market. German debt manag-

ers were thus among the largest market makers in the *bund* market and their choice of venue mattered for the market's overall infrastructural composition.

The rise of electronic trading thus confronted German debt managers with the choice of how to perform their role as market makers. Initially, the Bundesbank decided to trade on Xetra, the electronic platform of Deutsche Börse, which had already gained popularity for share trading in the late 1990s. Dealer banks, however, disliked the platform because it allowed all market participants, including final investors, to access the market's order book on equal terms, which dealers feared would harm their profitability. Apart from the trades conducted by the Bundesbank, overall turnover on Xetra remained therefore rather low. In 2000, the Bundesbank then decided to switch to Eurex Bonds, a dealer-led platform set up by Eurex, which in the late 1990s had managed to attract the market for *bund* futures (Cantillon and Yin 2007).

MTS nevertheless set up shop in Germany. In doing so, MTS gained the support of some of the important domestic dealer banks such as the DG Bank, Commerzbank, and the HypoVereinsbank. These dealer banks had been left out of the development of Eurex Bonds, the management of which had given priority to international dealer banks, including Deutsche Bank and the Dresdner Kleinwort. The backing of MTS was not just a pragmatic decision but also involved "a bit of pride," the head of DG Bank's government bond trading department confessed (Anonymous 2001; author's translation). Backed by different but overlapping dealer memberships, the two platforms competed with each other to attract liquidity. By 2006, the turnover on MTS was nearly twice the volume compared to Eurex Bonds. The volume on both platforms, however, seemed low in comparison to the volume of voice-brokered over-the-counter trading (Bundesbank 2007). The German bond market thus remained a heavily dealer-mediated market, difficult to enter for platforms like MTS and Eurex Bonds.

How to explain this? Three factors seem to have been decisive. First, because of the absence of a fully-fledged primary dealer system there was no need for an electronic platform on which dealers could fulfill their mandatory quoting requirements and on which debt managers could monitor their market making performance. Dealer banks generally prefer voice-brokered trading (or an electronic equivalent thereof) because it prevents information on large deals to "leak" into the market. Second, and related, some dealers had already developed their own electronic platforms for trading government bonds. Most notably, Deutsche Bank had an online system called "Autobahn," which allowed its clients to trade bunds with Deutsche Bank on a dedicated page on the Bloomberg terminal.¹ In later years, these "single dealer platforms" would be displaced by "multi-dealer platforms" that enabled market participants to request quotes from a selected range of dealers (mimicking the voice-brokered infrastructure). Third, the

1 Other dealer banks developed similar systems. JP Morgan, for instance, ran a similar page on Bloomberg called Bond eXpress. Clients of Goldman Sachs could trade with the bank on WeBTrade.

price transparency afforded by interdealer platforms such as MTS and Eurex Bonds provided little additional benefit in the German case because the price of bunds closely followed the price of *bund* futures, which by the middle of the first decade in the twenty-first century was the single most liquid market globally.

Overall, the unique position of the German government within the euro area hierarchy – “at the end of the day,” one of my interviewees said, “they sell the Coca Cola equivalent of government bonds” (Interviewee IG) – and the absence of a tightly knit group of primary dealers allowed German debt managers to refrain from explicit infrastructural coordination and focus on their own market making activities instead. They ultimately moved their market making business on multi-dealer platforms. Without the enforcement of mandatory quoting obligations and the need for an effective price discovery mechanism, dealers shied away from the interdealer platforms, preferring the opacity of multi-dealer platforms instead.

Phase 3: Consolidation of the European debt hierarchy

By the middle of the first decade of the twentieth century, MTS had thus established itself as a core part of the euro area’s market infrastructure, even if the extent of its usage varied across countries. In some countries, MTS really seemed to function as a liquid market place where dealer banks could effectively acquire or offload positions. In other countries, MTS operated more as a price discovery mechanism, where only relatively small lots would be traded, while the bigger trades would be conducted over the phone. And in still others (Germany), the use of MTS remained rather limited altogether. The rise to dominance did not go without criticism, and in subsequent years MTS loosened its grip on euro area bond market infrastructure. Three factors contributed to this.

First, the MTS model was increasingly criticized for incentivizing unintended and unwanted behavior, and incentivizing excessive levels of competition. From the get-go, not all market participants were MTS enthusiasts. In the trade press, for instance, one market participant said that having a single unified trading platform “is a dirigiste Italian concept for a controlled banking environment” (Shirreff and Lee 1999). Criticism compounded in 2004, when the market was rattled by the so-called “Dr. Evil” trade: in August of that year, Citibank – at the time a primary dealer for various European governments – flooded EuroMTS with €11bn sell orders, quickly buying back around €4bn sell orders soon after, making an estimated profit of €15mn within just a few minutes (Van Duyn and Munter 2004). Although it was unclear whether Citibank had done anything illegal – it was later fined €14mn by the FSA not for “market abuse” but for violating the principles of “due skill, care and diligence” and “control affairs responsibly and effectively, with adequate risk management systems” (Tett 2005) – it was alleged to have broken “the gentleman’s agreement that prevails on MTS” (Skorecki 2005).

Although a large part of the blame went to Citibank's traders who were alleged to have opportunistically abused the market structure, many also perceived the event as evidence of the market model's intrinsic weaknesses. Several interviewees, for instance, suggested that Citibank's opportunistic behavior was made possible by the fact that there had been ...

... an excess of liquidity ... that wasn't met by investors. ... People were putting excess volume through that platform ... to ensure that ... they would be in a league table and they would be able to get the next [syndication] deal. So, there were lots of stories of people passing large parcels between Goldman and Citi for a one cent move or whatever, and other European banks doing the same thing ... there was a false level of liquidity. (Interviewee HM)

The incentivization of market making through quoting obligations and ranking-based reward mechanisms, in other words, was perceived as creating market conditions that could easily be abused.

Second, changes in the ownership of MTS raised concern about the quality of its management. Initially, MTS was owned by a consortium of dealer banks after it was privatized in the late 1990s, with an increasing share owned by foreign banks. In the first decade of the twenty-first century, however, MTS got caught up in a wave of mergers and acquisitions fostering global stock market consolidation (Petry 2020). The American firm eSpeed tried to acquire MTS but faced political opposition because it implied European sovereigns would lose control over their own bond market infrastructure. Borsa Italiana and Euronext together put in a rival bid for 60 percent of the shares. The management of MTS wanted to avoid Italian ownership and hoped the deal would ultimately lead to Euronext assuming full control. They agreed that if one of the parties would be acquired by a major stock exchange group, the other party could assume the other party's 30 percent stake. Interviewees reported that most expected Borsa Italiana would soon be acquired by a major stock exchange group. In 2007, however, Euronext was acquired first by the New York Stock Exchange Group. Borsa Italiana exercised the option and became the majority owner of MTS, giving the impression that MTS was once again under Italian control. That Borsa Italiana was itself later acquired by the London Stock Exchange group hardly mattered in this regard.

The change in ownership also opened up the possibility for the MTS's management to experiment with expanding access to hedge funds. In the US, hedge funds were already allowed to access the "insider" prices on the interdealer platforms of the Treasury market (see MacKenzie et al. 2020). In Europe, however, the decision was hugely unpopular among some of the large dealer banks.

From the bank's point of view, we're playing in this market and we have to hold our prices tight. And at least we're trading with other people who also have to hold their prices tight, and the whole point is that we can risk transfer between us, efficiently. What we don't want is a hedge fund coming in, one side of the market, who has got no obligation to be there on the other side, coming in and destroying the market by taking huge swathes of liquidity out at cheap prices, the

internal prices. ... And then the banks said, oh, no, no, you're actually breaking market structure here. The reason we have two markets, an interbank market and a client market, it's for two very different purposes. One is that we service clients with our balance sheets. The other one is a risk transfer mechanism so that the collective banks can lay off risk efficiently on the system ... the last thing they want to do is allow the clients into the inside prices. (Interviewee WY)

Many dealers subsequently threatened to bail on MTS, which caused it to revoke the experiments and fire its CEO (see also MacKenzie et al. 2020).

A third factor was that the technological capacities of dealers had expanded significantly, which made them more likely to favor competition between trading platforms. In the first few years of the twenty-first century, all but the most technologically developed dealers feared that splitting a market across different platforms would cause fragmentation of liquidity. By the middle of the first decade in the twenty-first century, however, most (if not all) dealers had developed their technological capacities to the extent that they could integrate the different systems and link them up to their own pricing engine, allowing them to adjust prices across all platforms at once. This enabled the dominant narrative about platform entry to shift from fears of fragmented liquidity to productive competition among platforms.

By the middle of the first decade in the twenty-first century, these factors came together and enabled outsiders to challenge the dominant position of MTS in the euro area. The European Commission initiated a competition probe into MTS, arguing that competition among trading venues “is being undermined by rules that force traders to use the MTS platform” (Buck and Chung 2007). Competing platforms like the American BrokerTec, British BGC, and the German Eurex Bonds were eager to compete with MTS but failed to gain ground as long as MTS remained the only platform on which primary dealers could fulfill their market making obligations. The Dutch State Treasury Agency was the first to open up competition among platforms – “We thought it was fine, as long as they had the same obligations toward us, and as long as it is the case that there is a link between the platforms, such that it is a single virtual market” (Interviewee IB; author’s translation). Other countries similarly allowed primary dealers to fulfill their market making duties on platforms other than MTS.

5 Discussion and conclusion

This paper set out to describe the socio-technical mechanisms of aggregation that lie behind the abstract market dynamics of demand and supply in Europe’s markets for public debt. With the turn toward capital market financing of state’s budget deficits, European states have sought to reform how markets for public debt operate in practice. As evidenced by the history of MTS, the way Europe’s states are imbricated with global capital markets tends to differ. Although all states rely on a limited group of dealer

banks to aggregate supply and demand, the rules of the game may nonetheless differ from one country to another. Moreover, while some states rely on a relatively small group of dealer banks, which in some cases is dominated by domestic dealers, other states maintain less restrictive criteria for dealers to participate in the primary market, while bestowing fewer privileges upon participating dealer banks. These privileges may come with formal and/or informal expectations for how dealer banks should behave not just in normal times but also in times of stress when it's harder for sovereigns to maintain the market order. Understanding states' capacities to borrow in times of stress thus requires paying attention to how their market relations are structured, not just with lenders but also with dealer banks.

In the paper, I also identified two factors that were likely important in shaping how the rules of the game in different markets developed. First, the reliance of governments on capital markets to finance budget deficits means dealer banks enjoy some degree of "infrastructural power": they share in the capacity of the state to determine the rules of the game in markets for public debt and typically maintain close ties to government officials tasked with the management of public debt. Dealer banks, moreover, can in theory limit states' access to capital market liquidity, which means states must ensure at least a basic level of profitability of primary dealership, whether in direct economic terms or whether in the form of rather more indirect rewards (privileged access to information flows). To the extent that dealer banks have a shared interest and the capacity to articulate this interest collectively, they may have a stronger position vis-à-vis the state and control over the rules of the game. At the same time, however, the "infrastructural power" of dealer banks is somewhat limited by the fact that states are simultaneously issuer and regulator and thereby have the capacity to impose requirements as they see fit. They can, for instance, impose rules aimed at fostering competition among dealer banks thereby limiting the degree of their shared interest and hampering dealer's capacity to act in unison. States, moreover, can retract dealer banks' privileged access to primary auctions, although the strength of this threat will depend on the importance of a dealership for a bank's business model and its clientele.

Second, the uptake of MTS across European sovereign debt markets was shaped by isomorphic pressures on states to adopt similar bond market models. When faced with competition from other states, states may experience increased uncertainty around capital market access in times of need, and this uncertainty reduces the willingness of states to deviate from other states. The isomorphic pressure arising from the eurozone was especially strong at its beginning, when states were unclear about their position in the European debt hierarchy, and even Germany had to compete with France for achieving benchmark status. When sovereigns' position in the debt hierarchy had become less uncertain, isomorphic pressures similarly reduced, creating space again for public debt managers to diverge from other states. Whether and how new entrants to the eurozone, like Slovakia and Slovenia (where MTS did set up shop) and Estonia (where they didn't), faced the same isomorphic pressures remains to be studied.

Taken together, these findings suggest that to understand the politics of sovereign debt, scholarship must pay attention not just to market demand in an abstract sense, but also in a concrete material sense: what concrete mechanisms of market aggregation operate in a market for public debt, and how do these mechanisms of aggregation enable and constrain states' capacity to borrow. This involves paying attention not just to the ways in which creditors "enforce" debt repayment by states (Roos 2019), but also to the ways in which states set rules for and bestow privileges on dealer banks.

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