Capital Markets Union: the need for common laws and common supervision

JAN FRIEDRICH AND MATTHIAS THIEMANN

Jan Friedrich, Johann Wolfgang Goethe-Universität Frankfurt am Main, e-mail: friedrich@safe.uni-frankfurt.de
Matthias Thiemann, Johann Wolfgang Goethe-Universität Frankfurt am Main, e-mail: thiemann@soz.uni-frankfurt.de

Summary: This paper examines the supervision of Central Clearing Counterparties (CCPs) in Europe, since they function as an important pillar of the Capital Markets Union. Our research indicates that the current national-based supervision of CCPs leads to regulatory arbitrage and exposes the EU to huge financial risks, especially in the context of the Brexit. We claim that a unified capital market should have a centralized capital markets regulator to avoid a hazardous regulatory race to the bottom. We argue that the ECB is suitable for taking on this common supervisor role in the short run, while ESMA should be equipped with enhanced capabilities to accomplish the task in the long run.

Zusammenfassung: Dieser Artikel analysiert die Aufsicht von *central clearing counterparties* (CCPs) in Europa, da diese einen wichtigen Eckpfeiler der Kapitalmarktunion darstellen. Unsere Forschung deutet darauf hin, dass die derzeitige nationale Organisation der Aufsicht von CCPs zu regulatorischer Arbitrage führt und die EU einem erheblichen finanziellen Risiko aussetzt, insbesondere vor dem Hintergrund des Brexit. Wir fordern, dass ein einheitlicher Kapitalmarkt auch einen zentralen Kapitalmarktaufseher haben sollte, um ein gefährliches regulatorisches *race-to-the-bottom* zu verhindern. Wir argumentieren, dass die ECB kurzfristig ein geeigneter zentraler Aufseher ist, während ESMA langfristig mit erweiterten Kompetenzen ausgestattet werden sollte um diese Aufgabe zu übernehmen.

→ JEL Classification: G18, G23, K22
→ Keywords: Capital Markets Union, clearing, regulatory competition, regulatory arbitrage, supervision

1 Introduction

The Capital Markets Union is the current flagship project of the European Commission. Initiated in 2014, several of its elements passed through the legislative process in the European Commission and the European Council in record time. Its most important initiative—Simple, Transparent and Standardized (STS) securitization, which seeks to revive the securitization market in Europe—was agreed upon in the trilogue between these three EU institutions in May 2017 (EC 2017a). The initiative is supported by the conviction that the transformation of bank loans into tradeable securities—if properly applied—has the potential to lift growth. Overall, it is argued that a unified European capital market that facilitates more "market-based financing" will enhance the flow of credit and help overcome the dependency on local bank credit. This follows a particular reading of the crisis that focuses on why the U.S. has recovered so much more swiftly than the European Union, which now in turn seeks to achieve "resilient market-based financing" (FSB 2014). However, in absorbing these lessons, the EU risks neglecting other important insights from the crisis that relate to reasons why the EU sunk so deep into the crisis in the first place.

While analysts might be correct in pointing out that the U.S. system of "market-based finance" has served as an engine for the strong rebound of the U.S. economy when compared to the bank-based European financial system (Langfield and Pagano 2016), this analysis overlooks the fact that the U.S. system strongly involves the federal state (most prominently in the form of the Federal National Mortgage Association (Fannie Mae and Federal Home Loan Mortgage [Freddie Mac], but also GNMA and Sallie Mae)).[1] On the other hand, these analysts also tend to forget that the major reverberations generated in the EU were caused in no small part by the regulatory leniency of national banking regulators regarding the engagement of their national banks within the "shadow banking system." Concerned over the fate of their national banking champions in the context of European financial market integration, national supervision was weak and led to the fact that regulatory loopholes in the shadow banking system were not closed (Thiemann 2012, 2014, 2016).[2] It is this danger of regulatory competition residing within a system of national supervision that is at risk of being neglected within the CMU.

Especially at its outset, the Capital Markets Union was characterized by a light-touch approach to regulation, epitomized by the British Commissioner Jonathan Hill, who advised regulators to proceed with caution in order to let financial markets prosper (e.g. Hill 2016). In the wake of the Brexit decision, this market-creating approach has begun to shift, embracing a more market-shaping approach that seeks to act forcefully against regulatory competition between the EU and the United Kingdom.[3] A major point of contention in this dispute is the Central Clearing Counterparties, which have become central financial market infrastructures in the years since the crisis and function as crucial elements in the reconfigured shadow banking system that is critical

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1 In addition, the Farm Credit System and the Community Reinvestment Act serve as two other important means of intervening in the system.

2 The exception to the rule is Italy, where a vigilant Banca d'Italia did not permit rule evasion. Then again, the capacity of the Banca d'Italia to protect national incumbents was very high at least up until 2005 (Thiemann 2016).

3 The political-economic motivations of the current threats towards capital market business in the UK are obvious, with seeking to claw as much business as possible from the City of London towards the continent. Yet for once this motivation to gain more capital market business from a rival might go hand in hand with improved supervision at the EU level and hence might represent a step towards a more resilient Capital Markets Union.

for achieving the goals of CMU (see also Bruehl et al 2015).[4] CCPs operate on a high-volume and low-margin business, like most other parts of the shadow banking sector (Pozsar et al. 2010), which makes attempts to game the rules endemic to the industry (Thiemann and Lepoutre 2017). As regulatory costs are a major competitive factor, this industry is prone to regulatory competition, where collusion between regulators and the regulated to gain market share might lead to ill-incentivized supervision. For this reason, EU officials are seeking to enhance European CCP supervision, especially with respect to the Brexit.

In this paper, we argue that this market-shaping approach should be applied not only to the EU-UK relationship, but also in the pan-European dimension as well, given that the threats of regulatory competition from within the EU are as virulent as those from outside of it. Hence fixing the threat of regulatory competition through a strong EU supervision of third country compliance with capital market rules, e. g. within the UK, should only be the first step towards creating a regulatory architecture that focuses on a strong common European supervision of common European rules. Based on this threat and on the insight that common laws without common supervision are not able to prevent a regulatory race to the bottom—hence in the banking sector, the solution was to create the (yet-to-be-completed) banking union—this paper supports the calls for a strong, centralized euro area supervision and explores the different pathways available to arrive at such a development.

The paper proceeds as follows:

- Explains the goals of CMUs and the role of CCPs within them,
- explains the sensitivity of the business models of CCPs to regulatory competition, and why—just as it did before the crisis—this sensitivity might lead to national regulatory leniency,
- reviews the current setup of the regulation and supervision of CCPs in Europe (EMIR), including strengths and weaknesses, and
- lays out the possible ways forward to overcome these problem.

2 The Capital Markets Union and the role of Central Counterparties

The Capital Markets Union (CMU) is a key project of the European Commission and a central pillar of the Juncker Plan. The CMU aims to promote economic growth in the EU by deepening the integration of capital markets (European Commission 2015: 4). It is intended to mobilize capital from financial markets and channel investments to corporations, especially to SMEs, as well as to infrastructure projects (European Commission 2017b) by facilitating cross-border investment in Europe. The overall objectives of the CMU can be divided into four subgoals (European Commission 2015: 3), namely:

4 We thereby report first results of the SAFE Research Project "Regulatory Competition and the Increasing Fragility of CCPs", for which four expert interviews and an extensive document review were already undertaken.

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1. Unlocking more investment from the EU and the rest of the world.

2. Better connecting financing to investment projects across the EU.

3. Making the financial system more stable.

4. Deepening financial integration and increasing competition.

The CMU aims to promote market-based financing[5] by removing cross-country trading barriers, facilitating the free flow of capital across one European capital market. CCPs represent a crucial cornerstone in this process, since clearing is an important element of post-trading services. Clearing resides between the execution of a trade and its settlement through central security depositories (see Figure 1 in the Annex). A CCP is a financial risk management institution that pools, nets, and diversifies counterparty risk by setting itself between the buyer and the seller, guaranteeing the termination of a market transaction (Chamorro-Courtland 2012: 435). In this way, CCPs can contribute to the stability of the financial system as they limit contagion default risks (Duffy 2016: 30, Cont and Kokholm 2014: 2).[6]

Because they proved resilient during the turmoil, CCPs have been promoted in the aftermath of the financial crisis by the G20 (G20 2009) (The Depository Trust & Clearing Corporation 2008). CCPs thus extended their market share significantly. By the end of December 2016, 37 percent of credit default swaps and 76 percent of interest rate derivatives had been centrally cleared (BIS 2017: 2). Those derivatives are essential for market participants as they allow for the hedging of default or interest rate risks. If the market for STS succeeds, the related derivatives should be available at minimum costs while the CCPs remain resilient, even in times of financial stress.

However, the increasing competition among CCPs has led to a consolidation in the sector and thus to a concentration of risk. These developments have made CCPs themselves "too big to fail", since an insolvency of a large clearing house may cause a new financial crisis. The European Market Infrastructure Regulation (EMIR), enacted in 2012, is the centerpiece of CCP regulation in Europe for ensuring the financial stability of clearing houses. This regulatory framework aims to ensure the financial stability of CCPs by defining specific key measures and minimum requirements for a sound internal risk management, especially for the margining of collateral.

To cover potential losses if one or a set of its clearing members defaults, CCPs have three "lines of defense" that follow the waterfall principle, namely:

- The CCP is obliged to take an appropriate margin on cleared assets to cover the counterparty default risk as well the price fluctuation risk of the assets.

5 Formerly known as shadow banking, but since 2014 rebranded as "resilient market-based financing".

6 Moreover, CCPs can engage in multilateral netting. This implies that the cross-exposures of a CCP's clearing members can be netted off against each other, reducing the balance sheets of its clearing members (ICMA 2017). In this way, CCPs indirectly lower the interconnectedness of clearing members and increase the financial stability (Deutsche Boerse Group and Eurex Clearing 2014: 13).

- All clearing members have to contribute to certain default funds that cover any losses that might occur if the margins turn out to be insufficient.

- If the default fund is also insufficient, the CCP is liable with 25 percent of the amount of the respective default fund—this is known as the "skin in the game".

While the three lines of defense are supposed to secure the financial stability of CCPs and protect clearing members from losses, they also impose regulatory costs on both. Clearing houses only obtain a lower profit margin per trade, and thus a high transaction volume is key for the success of a CCP. On the other hand, customers are extremely price sensitive and can easily switch to another CCP—the CCP that offers the best conditions, at the lowest margins, will likely continue to attract customers. Therefore, even small adjustments to a CCP's margining requirements can lead to large changes in the transaction volume. This creates a strong incentive for both parties to reduce those regulatory costs (lower costs for customers, higher transaction volume for the CCP), making a sound supervision indispensable to avoid regulatory arbitrage.

Currently, London is the international financial center for the euro-denominated clearing of trades, accounting for 75 percent of interest-rate derivatives (Bloomberg 2017). However, the announcement of the Brexit in summer 2016 has raised the question of whether this systemically important market infrastructure has to move to the euro area. A failure of a large CCP in the UK would expose the EU to huge financial risks, while the EU would have no tools to intervene directly. Thus policymakers in the European Commission as well as ESMA and other actors have called for *"enhanced supervision at the EU level and/or location requirements"* (Dombrovskis and Katainen 2017), as CCPs *"are subject to the safeguards provided by the EU legal framework"* (ibid.), especially in view of the CMU. But will those improvements be sufficient? Did policymakers really absorb the lessons from the financial crisis or is history bound to repeat itself?

3 Integrated financial markets but a fragmented supervision? The CMU and the lessons from the financial crisis

There is a danger of history repeating itself that resides in the fallacy of setting up common markets without also setting up a common supervision and instead relying on nationally divided regulatory and supervisory responsibilities. This can be learned from the process of financial market integration (e. g. Kotz 2006, 2007), starting from 1988 and driven by increasing bank competition (Muegge 2010), which arguably contributed to the unexpectedly large fall out of the financial crisis in Europe (Thiemann 2012, 2016). From this perspective, the larger project of CMU and of CCPs can be seen as another process of further financial market integration driven by shadow banking entities and the investment banking arms of large national/European champions (Howarth et al. 2016; Hardie and Macartney 2016), which risks engendering the same detrimental dynamics of regulatory competition.

What do we know from past (European) financial market integration processes? The last one started in earnest in 1988 (single passport 1989), followed by the Maastricht Treaty in 1992 (Maastricht), which finally led to the creation of the euro area (1999). The process of this increasing integration was based on the formation of national champions, first and foremost banks (Boot 1999, Grossman and Leblond 2011), which regulators encouraged to merge (Thiemann 2016).

This increase in competition went hand in hand with a conviction by regulators that only a few large banks would survive, leading to a form of regulatory competition where national regulators sought to support their national champions through regulatory laxity (Thiemann 2016). Subject to similar rules due to Basel I, national supervisors chose to adopt more lenient interpretations of certain regulations in order to support the engagement of their banks in wholesale capital markets, also known as shadow banking activities (e.g. Enria and Texeira 2011).

As a reaction to the malfunctioning of this regulatory architecture that was revealed by the crisis, we witnessed a move toward a banking union in 2012 that was intended to stabilize the system by breaking the state-bank doom loop. A second important aspect involved placing supervision in the hands of one supervisor to overcome regulatory nationalism (Véron 2013, 2014). Moreover, the further integration of European financial markets aims to reduce the exposure of banks to domestic markets and make one of the main advantages of national-based supervision (Houben et. al. 2008) obsolete. As Epstein and Rhodes put it, *"[t]he perceived need to solve collective action problems shifted the balance of opinion—and power—in favor of EU-level centralization of banking authority"* (Epstein and Rhodes 2016: 432).

However, this thinking has not led to similar changes in the supervision of unified capital markets. This despite the fact that in the aftermath of the financial crisis, the shortcomings of a national-based supervision were stressed by the European Commission and have also been discussed during the drafting of EMIR (European Commission 2009a: 1, 11; 2009b: 5). As a consequence of the lessons learned after the financial crisis, the European Commission initially envisioned a common supervision of CCPs, preferably for one unified CCP in the EU (European Commission 2009a). However, in the EMIR—published in 2012 and representing the outcome of arduous years of negotiation—it is stipulated that the supervision of those rules resides with the national competent authorities (EMIR 2012: 8), such as national central banks or financial services authorities. At the same time, the European Securities and Markets Authority (ESMA) should control a consistent application of EMIR (ibid.: 3). At first glance, this organization of CCP supervision seems to ensure the compliance of all jurisdictions. However, ESMA lacks capabilities to intervene when a CCP engages in regulatory arbitrage behavior as it is *"as a club of national regulators, a congregation of them, a secretariat"* (interview European CCP supervisor, October 2016), but not an independent supervisory agency (Regulation (EU) 648 2012: 8).

This strong fragmentation of supervision was caused by a refusal of the member states to share the burdens of resolving a failed CCP—a story we know from 2009 with regard to banking (de Larosière Report 2009) and which continues with the yet-to-be-completed banking union. Aligning the modus of supervision with the fiscal responsibilities connected to it essentially made common EU supervision impossible (EMIR 2012: 8). The need for strong common supervision was brought up again in the context of the review of EMIR in 2015, but no consensus could be reached on how to resolve it. Instead, member countries such as the UK insisted that there is no European central backstop for CCPs, and thus *"[t]he UK could not* [...] *support the transfer of direct supervision of market infrastructures such as Central Counterparties (CCPs) and Central Securities Depositaries (CSDs) to a European level"* (Comment Letter by the BoE from 2015, published in the Department for Exiting the European Union 2017). They argued that the supervisory infrastructure should remain national (ibid.) with the European Supervisory Agencies (ESA) as the main agents to achieve convergence.

Thus, while the EU centralized the supervision of banks to address the deficiencies of splintered supervisory governance that were revealed post-crisis (e. g. expressed by the General Director of the European Commission, Faull 2011: 3–4), the supervision of CCPs remains largely decentralized and hence comparable to pre-crisis arrangements for banks on an institutional level. Following the turmoil of the financial crisis, the regulatory architecture thus settled again for a decentralized version, which implies a structural setup in which regulation does not move with the level of the market activity. However, the first wave of EU-led financial market integration that began in the 1980s (Boot 1999, Veron 2014) teaches us that this is a very bad idea, as a common capital market should have one common supervisor.

This becomes particularly evident in the case of CCPs, where our interviews with risk managers of CCPs, supervisors of competent authorities and members of central banks revealed acts of regulatory arbitrage, which are tolerated by some supervisors, providing their domestic CCPs with important competitive advantages. This is the case despite the fact that EMIR itself is seen as a big improvement on prior risk management strategies. In this vein, risk managers of CCPs point out that EMIR has indeed revolutionized risk management practices of CCPs, putting a much larger burden on them in terms of stress testing and the need to innovate in order to increase safety (interview risk manager large CCP, October 2016). At the same time, while the practitioners acknowledge that these rules are generally positive, they point out that they lack the appropriate practical implementation. This is caused by ill-structured incentives for risk managers (see also Krahnen and Pellizon 2016), but also the fragmented structure of supervision (interview with a former risk manager, December 2016). This fragmented structure of supervision allows supervisors to interpret certain rules in a very lax way, accepting de facto non-compliance as compliance (interview European supervisor CCPs, October 2016).

From these interviews, the urgent need for a common regulatory *and* supervisory infrastructure in Europe where regulation moves with the scope of the market seems urgent (see also Allen et al. 2017). In the context of the Brexit, such a debate has been stirred up with respect to the CCPs based in the UK that will effectively be moving out of the EU. Major regulatory figures, such as the Chair of ESMA, Steven Maijoor, have pointed to the dangers of a regulatory race to the bottom with respect to CCPs and have therefore insisted that ESMA be given a greater regulatory say, ensuring the proper implementation of EU rules in third countries (Maijoor 2017).

In a speech to the EU Parliament in May 2017, EC Vice-President Valdis Dombrovskis pointed to the increasing concentration of CCPs and the risks they generate as a reason to pursue common supervision (Dombrovski 2017).[7] In that same speech, he pointed out that the main focus currently resides in the supervision of third-country CCPs. *"For third country CCPs which play a key systemic role for the EU, we are looking in particular at two possibilities for enhanced supervision: We can ask for enhanced supervisory powers for EU authorities over third country entities. Or such CCPs of key systemic importance for the EU could be asked to be located within the EU. We now need to look at these options in the impact assessment"* (ibid.). While acknowledging the risks of market fragmentation, he insisted that *"the EU needs to be able to ensure supervisory oversight over such key CCPs."*

7 *"At the same time, the EU clearing business tends to strongly concentrate in a small number of central counterparties, or CCPs. This concentration increases the importance of the most significant CCPs for the financial stability of the EU as a whole. And so it makes sense that the EU carries a certain amount of common responsibility for their supervision. This is an issue we are considering, as we further develop our Capital Markets Union and review the functioning of the European Supervisory Authorities"* (ibid.).

The awareness of EU officials regarding the need for common supervision of common rules is a welcome development; what seems most important to us is that the issue is not only reflected upon in terms of the EU-UK relationship, but also within the EU. Especially given the high concentration of CCPs in the EU, such supervision seems meaningful. It is important that the rhetoric on the need for common supervision, motivated in part by the desire to justify the removal of CCPs clearing euros out of the UK, is transformed into action, as the problem of regulatory competition crops up as much between France and Germany as it does between both countries and the UK. Addressing these issues will require the establishment of a common supervisor with sufficient expertise, manpower, and funding to undertake such a task. In the following, we consider the different ways forward.

4 Possible ways forward

The recent discussions concerning the supervisory structure of CCPs among decisionmakers in the context of the Brexit is evidence of an active attempt to establish common European supervision. A recent report published by the European Commission states that:

"Critical capital market functions whose sound performance and effective supervision is central to the functioning of capital markets call for more centralisation of supervision. Therefore, adaptations to the legal framework in relation to supervision by the European Securities and Markets Authority (ESMA), and in relation to the responsibilities of the central bank of issue are necessary. Consideration must be given amongst other things to authorisation of CCPs and ongoing supervision at EU level, for instance by means of monitoring financial resources and liquidity risk" (European Commission 2017: 3).

This quote points to the main problems that need to be addressed in order to achieve this kind of common supervision. Treaty changes and a corresponding coordination of responsibilities for ESMA and the ECB are necessary to move forward. Considering these challenges, there are three possible avenues for action:

1. The EU improves the supervision over third-country CCPs,
2. the EU enhances the regulatory capabilities of ESMA or
3. the ECB becomes the central European supervisor for CCPs, combined with a pooling of fiscal responsibilities under the SRM.

In the first scenario, the EU enhances existing regulatory provisions for third-country CCPs. This would strengthen the supervision over non-European CCPs and prevent a race to the bottom through tougher regulatory requirements *as well as* their implementation. In this way, non-European CCPs can be recognized as equivalent, allowing euro-clearing and settlement services to stay in (future) third countries such as the UK. While this may look like the easiest way forward, this solution would expose the EU to a huge financial risk. On the one hand, possibilities of regulatory arbitrage would likely still exist, inspired in particular by an extremely competitive environment as lessons from the financial crisis have taught us—also among CCPs within the EU.

Enhancing the supervisory power of ESMA is a second possibility. The main advantage of this solution is that it extends an already existing regulatory body—a seemingly neat response to the problem. The transferring of responsibilities to European institutions has been a huge legal challenge in the past. However, a recent court decision by the European Court of Justice has opened the door wide for such a solution. This court decision emphasizes that the "Treaty on the Functioning of the EU" (TFEU) *"does not confer any autonomous power on ESMA that goes beyond the powers granted to that authority"* (Court of Justice of the European Union 2014: 1). Thus ESMA can be equipped with additional competencies *"if the legislature can plausibly show that this measure is necessary for the establishment of an integrated capital market and the prevention of regulatory arbitrage between the member states"* (Goldman 2017). In other words, European bodies can extend their decisionmaking competencies *"as long as they have a clear mandate, are sufficiently controlled by EU institutions and respect due process rights"* (ibid.).

However, even in this case, the issue of the alignment of fiscal responsibilities and supervision would have to be addressed. In this context, it must be stated that the abovementioned 2014 court decision may also allow an extension of the Single Resolution Mechanism (SRM) in order to include CCPs without changing the TFEU. Legal specificities would still need to be clarified—however, the main ingredient for this policy solution is the political willingness on the part of the member states in the euro area to jointly assume the risks inherent in market-based finance. Without it, there will never truly be one European supervision, and the danger of a race to the bottom will not be eliminated.

While this is one option, the question arises as to whether ESMA is the appropriate regulator for CCPs. Given that the fate of CCPs and its members, the large banks are inextricably interwoven with each other, one might well argue that the ECB would be more appropriate. Indeed, this is the argument the Bank of England advanced when explaining why CCP and banking supervision are bundled into a single authority in the UK (BoE 2015). This line of argument brings us to the third possible way forward: a common supervision under the umbrella of the ECB, which could expand its supervisory capabilities to CCPs. Based upon TFEU Art. 127(6), the Council could confer this task upon the ECB. Such a transfer would also solve the important issue of expertise in supervision, which ESMA currently lacks. As Kay Swinburne, Vice Chairman of the European Parliament Committee on Economic and Monetary Affairs, has put it: *"ESMA has never been a hands-on supervisor; it's the writer of rulebooks and enforcer of rules, so it's a very different role to hands-on supervision. CCPs are complex institutions, so you want experts to supervise them"* (Reuters 2017). The ECB is an experienced supervisor of financial institutions in Europe and has proven its ability to act as a central supervisor within a net of national authorities. In this way, the issue of a fragmented supervision would be addressed, while supervision would continue to benefit from the expertise of national regulators. Moreover, the already existing SRM could be expanded to pool national fiscal responsibilities, thereby providing a sound legal basis for supervision by the ECB. Another option is to temporarily delegate supervision to the ECB until ESMA has built up the expertise to do so.

In whatever way this problem is resolved, either with ESMA or with the ECB, it is important that it is addressed after all. Without the joint supervision of CCPs, however, the project of unified capital markets risks being derailed, leading once again to the excessive and potentially hidden risk-taking that made the last crisis in market-based finance so pernicious. In light of the experience of the most recent crisis, the currently proposed measures in CMU and EU regulations—such as an increase in market discipline by setting the proper incentives for due diligence and the delegation of responsibilities to the national level and the market participants themselves—are unlikely to address these problems appropriately.

5 Conclusion

In the context of the Brexit, EU policymakers are considering giving a strong supervisory leg to the envisioned Capital Markets Union. We argue here that efforts towards a system of common European supervision of CCPs are crucial for achieving the goals of the CMU. At the same time, we point out that such an empowerment of EU-level regulators should occur not only with respect to third countries, such as the UK, but also within the EU. There is no reason to think that only British regulators are prone to engaging in regulatory leniency, and hence a regulatory race to the bottom can also take place within the EU. We point out that in the long run, a sustainable solution for the supervision of CCPs can only be achieved through a commitment to sharing the fiscal burden should the failure of a European CCP occur.

We then describe the different options for launching a single CCP regulator and the concomitant pooling of fiscal responsibility. We point out that the already established SRM can serve as a basis for such a pooling, and that for the moment, the ECB—in contrast to ESMA—has the expertise to undertake an appropriate supervision. In the long term, the ECB could be replaced by an empowered ESMA. Whatever the final solution is, the last crisis of shadow banking teaches us that common capital markets require not only common rules, but also common supervision. It is the hope of the authors that this insight does not need to be rediscovered after the next financial crisis emanating from the shadow banking sector.

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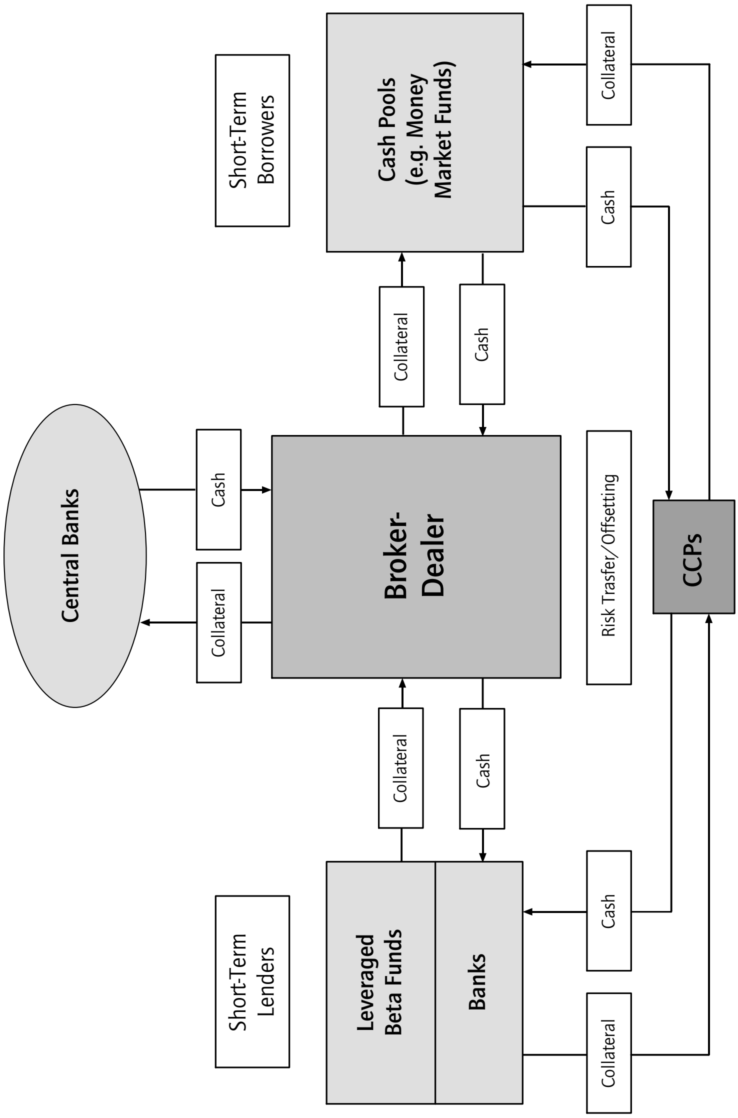
Appendix

Figure 1

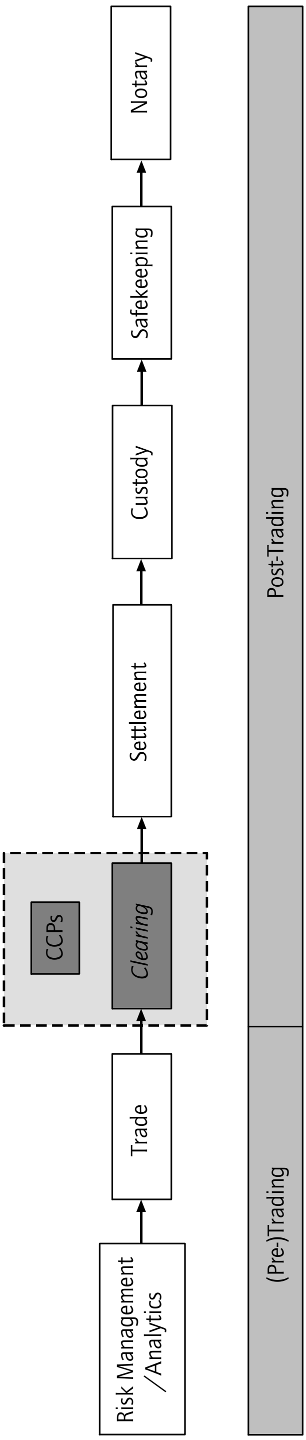
The Role of CCPs in the Shadow Banking System



Source: Thiemann et al. (2017).

Figure 2

CCPs in the Post-Trading Process



Own figure, based on Deutsche Börse (2005).