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The euro-area denominated payment systems and the conduct of monetary policy MONETARY DIALOGUE February 2018

DIRECTORATE GENERAL FOR INTERNAL POLICIES

POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

The euro-area denominated payment systems and the conduct of monetary policy: Some considerations ahead of Brexit

IN-DEPTH ANALYSIS

Abstract

The framework for euro-denominated payment systems has undergone significant changes in recent years leading to a concentration of payments performed by Central Counterparty Clearing Houses. As it stands, a large part of euro-denominated transactions, derivatives in particular, are cleared through CCPs located in the UK; which poses challenges to the current supervisory framework because of the UK leaving the EU. Against this background, this note discusses the extent to which the current set-up bears risks, including for the conduct of the ECB monetary policy.

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LIST OF ABBREVIATIONS

CCP	Central Counterparty
CCPs	Central Counterparty Clearing Houses
CFTC	Commodity Futures Trading Commission
CLS	Continuous Linked Settlement
EMIR	European Markets Infrastructure Regulation
ESCB	European System of Central Banks
ESMA	European Securities and Markets Authority
LCH	London Clearing House
LSE	London Stock Exchange
OTC	Over-the-counter
SEC	Securities and Exchange Commission
SSSs	Securities Settlement Systems
TFEU	Treaty on the Functioning of the European Union

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EXECUTIVE SUMMARY

Background

Monetary policy and payment systems are closely intertwined. The central bank is dependent on a secure and efficient payment system that is a prerequisite for a smooth transmission of monetary policy stimuli and the preservation of financial stability. In the recent years, payment systems have undergone significant changes with financial innovation and regulatory frameworks leading to a concentration of payments performed by Central Counterparty Clearing Houses (CCPs). As a consequence, the safety and soundness of CCPs of systemic relevance has become a major concern for central bankers and supervisors. An additional issue in the case of the ECB is that a large part of euro-denominated transactions are cleared through CCPs located in the UK which poses challenges to the supervisory framework because of Brexit. Against this background, the EMIR (European Market Infrastructure Regulation) II legislative proposal seeks to ensure a more efficient oversight of CCPs of systemic relevance with a particular focus on those located outside the euro area. In the meantime, the ECB has asked to be conferred powers to regulate CCPs.

Aim

- This note discusses
  - the interactions between payment systems and monetary policy for the euro area;
  - the extent to which the current framework for euro-denominated payment systems - with the large role played by some key CCPs located in the UK, and London, in particular - bears risks for the conduct of the ECB monetary policy;
- It looks at the issue of post-Brexit euro clearing assessing the *status quo* vs the current European Commission proposal;

1. GENERAL INFORMATION

KEY FINDINGS

- With its general responsibility for financial stability, the Eurosystem and regulators have a general interest in the smooth functioning of securities clearing and settlement systems.
- While CCPs have a higher concentration of risk than the single participants of a decentralised market, this concentration contributes to a market's liquidity by keeping the cost of trade completion as low as possible, reducing risks to its participants.
- As seen during the sovereign debt crisis, however, CCPs can also have a negative impact on a market's liquidity through margin requirements.
- The fact that the largest clearing houses engaging in euro-denominated transactions are located in the UK was a contested issue even before the UK referendum.
- Once the UK will withdraw from the EU, the European law would require the EU to determine that the UK has an "equivalent" regulatory regime for its clearing and trading platforms. This is the same "equivalence" process that applies to other non-EU members.
- Leaving the European Economic Area (EEA) would mean that the UK would no longer be legally obliged to subscribe to the EMIR framework. Among other things, this implies that derivative transactions conducted in the UK would no longer have to be reported to the European Securities and Markets Authority (ESMA).
- Failure to find equivalence status would mean European financial firms will face higher capital charges for transactions cleared in the UK.
- The Commission's proposal makes relocation of large clearing houses as a last resort possibility, to apply only should the EU and the UK authorities fail to come to an agreement on "enhanced supervision" of CCPs based in London.
- Besides this specific consultation regarding the UK's EU withdrawal, we believe further concentration of the EU clearing is very likely, along the lines of the US experience. In the EU, as well, the existence of economies of scope and of scale will favour the emergence of very large service providers, particularly in the light of the Capital Market Union.
- At the moment, should euro-clearing leave London, there is no euro-area equivalent of a large centralised clearing services provider like LCH Clearnet. One of the main recipients of London's euro-denominated clearing business could potentially be Eurex in Germany, supervised by the German Bundesbank and ESMA.
- It should be mentioned that, if Europe insists that clearing of euro-denominated products cannot occur in London, this could also rise to questions as to whether euro-clearing can occur anywhere outside of Europe, including in the United States. This could lead to other countries considering whether to adopt similar policies regarding clearing of products in their own currencies.
- We believe that going forward a joint approach, as is applied currently to EU-based CCPs that operate in the US, could be viable, with the EU and the UK sharing supervisory roles for systematically important extraterritorial CCPs.

2. THE INTERACTIONS BETWEEN PAYMENT SYSTEMS AND MONETARY POLICY IN THE EURO AREA

KEY FINDINGS

With its general responsibility for financial stability, the Eurosystem has a general interest in the smooth functioning of securities clearing and settlement systems.

While CCPs can – among the others - contribute to a market's liquidity by keeping the cost of trade completion as low as possible, reducing risks to its participants, as seen during the sovereign debt crisis, however, CCPs can also have a negative impact on a market's liquidity if exorbitant margin requirements are imposed.

Over the last couple of decades, financial markets in Europe have undergone significant changes as the result of liberalization, technological advances, globalization and consolidation of the payment systems. On the latter point, the introduction of the euro has certainly acted as a catalyst for reforms, requiring the creation of an integrated payment and settlement system infrastructure. The single currency has eliminated segmentation and currency risk, allowing the enhancement of portfolio diversification within the euro area, resulting in markets becoming more integrated. For instance, the introduction of a euro-wide large value payment system (TARGET[1]) has helped the integration of the unsecured money market.

Table 1: Euro Payment Systems

TARGET2	NCBs	Networks and Clearing Channels	Euro Bankers Associations
The Trans-European Automated Real-time Gross settlement Express Transfer system provides real time gross settlements for cross boarder electronic payments in euros.	National Central Banks remain a common method of cross border transactions for low vaue bulk payments Participate, together with the ECB, in the Committee on Payment and Settlement Systems (CPSS) of the G10 central banks, as well as the International Organization of Securities Commissions (IOSCO) in the field of Standards for the use of EU securities settlement systems.	These are relevant federations and organisations in the field of securities clearing and settlement systems which act as platforms to promote the interests of their members, to facilitate exchanges of views and to develop common standards and practices.	Most banks in the EU are organised into national federations or associations in order to represent their interests as a group towards public and private institutions. The national federations and associations also cooperate at the European level in the European Association of Co-operative Banks, the European Savings Banks Group and the European Banking Federation.

[1] Trans-European Automated Real-time Gross Settlement.

On the trading, clearing and settlement side, the single market and the euro have promoted the harmonization and integration of the securities' infrastructure. While at the moment there is no single platform for securities transactions for the whole euro area, some consolidation of infrastructure has taken place (i.e. the Euroclear group, as we shall discuss later); the main effect of which has been that of centring the concentration of payment flows in a few systems and participants. Still, some fragmentation can be observed not only in the light of the large number of service-providers involved, but also because of the domestic differences regarding mainly institutional, tax-related, as well as legal and technical issues.

Cross-border activities often rely on a variety of intermediaries, which result in complex processes, often lacking transparency. The payment system's policies of central banks are thus aimed at ensuring the efficiency – i.e. minimizing transaction costs – and soundness of payment systems. The smooth functioning of payment systems is important to central banks for three main reasons (BIS, 2003). First, a malfunction in a payment system could undermine the stability of the financial system. As we shall discuss later, this is mainly because of risks' concentration. Secondly, the efficiency, security, and soundness of payment systems affect investors' and ultimately the public's confidence. Finally, payment systems represent essential vehicles for the implementation of monetary policy. This is why central banks often have a dual role of regulator ("overseer") and service provider of the payment and settlement services (BIS 2003). The Eurosystem is no exception with the volume of euro-denominated transactions taking place, offering settlement services itself and assuming an operational role in payment systems, as emphasised in Article 22 of the Statute of the ESCB. In this sense, the central bank's payment systems functioning and prudential banking supervision share the common objective of making sure that the financial market structure is efficient and safe.[2]

At the moment, in Europe all the "domestic" large-value payment systems settle in central bank money. The three most important case of infrastructure providing settlement facilities in commercial bank money relate either to systems settling securities transactions (Euroclear and Clearstream Banking Luxembourg being an example) or to multi-currency systems (Continuous Linked Settlement - CLS). In the case of securities transactions, the issue of settlement in commercial bank money stems from the fact that a large number of participants in Securities Settlement Systems (SSSs) are non-banks and do not have access to central bank money. In the case of CLS, settlement in commercial bank money is motivated by the need to keep different currencies accounts at the same institution. Since at the moment there is no institution that can open settlement accounts in central bank money in all the currencies, the existence of clearing vehicles greatly simplifies the ability to have multilateral netting in the system. Importantly, this does not necessarily increase the level of commercial bank money but rather increases its concentration.

The Treaty establishing the European Community (Treaty on the Functioning of the European Union, TFEU) contains no explicit reference to the role of the Eurosystem in supervising the volume of euro-clearing transactions. Nevertheless, the interest of the Eurosystem goes beyond the limited perspective of the use of collateral in the context of monetary policy and liquidity/credit-provision. **With its general responsibility for financial stability, the Eurosystem has a general interest in the smooth functioning of securities clearing and settlement systems**.

In normal situations, the design of the euro payment systems does not affect directly the ability of the ECB to control the monetary stance. However, in exceptional situations the even

[2] The EU payment systems overseers and banking supervisors have agreed on a Memorandum of Understanding (MoU), aimed at promoting cooperation between payment systems overseers and banking supervisors in relation to large-value interbank funds transfer systems (IFTSs). While prudential supervision looks at the micro-dimension, i.e., institutions, central banks focus on the oversight of the system as a whole.

functioning and/or regular netting of payments systems will create a demand for central bank's liquidity. This would be partly due to difficulties in transferring liquidity in the system or additional uncertainties in the liquidity conditions. In those cases, the stability of the financial system may be affected by the risks borne by credit institutions arising from their very participation in payment systems. Thus, the spillover effects and systemic risks will be affected by the design and soundness of the payment systems: here, cooperation between the ECB and the National Central Banks and/or national supervisors is not only necessary but also essential.

2.1. Securities clearing and the role of CCPs

The importance of post-trade services – and of clearing, in particular – is due to the fact that financial market transactions commonly do not involve goods that are physically exchanged. The traded instruments often do not even exist physically.

Central counterparties (CCPs) have traditionally played a more significant role in futures and options than in cash equities markets due to the characteristics of derivative trades. The rapid growth of exchange traded derivatives in the past decades has been accompanied by an increasing internationalization of the markets and their clearing arrangements. Institutional investors, in particular, are increasingly trading derivatives, such as single stock futures or options, rather than the respective underlying stock. Derivatives markets are therefore growing faster than stock market activity. The daily liquidity of many equity derivatives is more than three times higher than the trading volume of the underlying stock, and the derivatives trading volumes continue to grow faster than the securities trading volumes. The exchange-traded volume of derivative financial instruments, such as futures and options on interest rates, exchange rates, cash equities and equity indices, has consequently grown enormously over the past decade: in the first half of 2017 the total amount of interest rate derivatives traded in OTC market was 415,917 trillion dollar compared to 64,124 trillion dollar in the same period of 2000, according to BIS (2017) whereas global stock market capitalizations reached 80 trillion dollar in 2017, according to Bloomberg.[3]

Clearing firms have started to play a central role in financial markets mainly after the financial crisis in 2008, when regulators around the world pushed for more derivatives trading to go through clearinghouses to reduce the risk of a default spreading across the system. In Europe, the European Markets Infrastructure Regulation (EMIR) established in 2012 requires financial institutions to centrally clear certain classes of over-the-counter (OTC) derivative contracts through central counterparties. Clearing houses have been since operating in the field of derivatives. More recently they have expanded their activities so as to cover also securities. It has been the case in Europe for the London Clearing House (LCH), Clearnet and more recently also Eurex. By increasing net versus gross-settlement, these vehicles have reduced the size of cash settlement triggered by securities transaction.[4]

Centrally cleared transactions have almost doubled between 2009 and 2015: in December 2009 this number moved from about 39% of interest rate derivatives which were centrally cleared before obligation to 60% after clearing obligation at the end 2015 (mostly the same picture for credit: before 12% and 45% after.[5]

[3] http://uk.businessinsider.com/global-market-cap-is-about-to-hit-100-trillion-2017-12.

[4] Today, the over-the-counter market for interest rate derivatives is the largest financial derivatives market in the world, mostly traded in the European single currency (122,6 trillion dollar) and in US dollar (156,2 trillion dollar). In spot markets the use of a CCP is not as widespread.

[5] http://europa.eu/rapid/press-release_MEMO-16-3990_en.htm.

This expansion in CCP activity is likely to continue in the coming years as further clearing obligations are introduced and the incentives to mitigate risks and costs may lead to additional voluntary clearing (FSB, 2016). Over 80% of swap transactions are being cleared today, as compared to only about 15% in 2007. There is a consensus among market participants that clearing with a CCP will play an increasingly important role in reshaping the securities markets in the future.

In the derivatives markets, **the clearing house acts as a central counterparty**, meaning that it interposes itself between two parties in securities trade.[6] As such, a CCP provides a number of benefits to market participants; many of which are attributable to multilateral netting. This allows a substantial reduction in the number of settlements, mitigating operational costs, thereby reducing each individual's contractual obligation. In other words, a CCP offers benefits mainly by providing risk management services. For instance, it simplifies the management of counterparty risk by providing a single counterparty instead of several. When trading in securities, market participants are exposed to both *liquidity* risk (i.e. the risk that their trading counterparties will not settle their obligations when these become due) or *counterparty* risk (i.e. the risk that the counterparty will not settle their obligations at all). In order to protect themselves against such risks, market participants can take preventive measures, e.g. by placing limits on exposure and employing collateralisation. CCP manage risks for their members, replacing exposures to multiple counterparties with a single exposure to a single counterparty. **Even though a CCP does not in eliminate credit risk *per sé*, it redistributes it and makes it easier for the firms to manage such risk by namely guaranteeing the fulfilment of a contract even in case one party defaults.**

Establishing a CCP does not come without costs, however, as CCPs need a robust risk management organization (Section 2.2). Initiatives among service providers to establish a pan-European CCP have been progressing. For instance, the clearing functions of the three Euronext exchanges (Amsterdam, Brussels and Paris) legally merged in 2001 into Clearnet, which acts as the CCP for all the transactions carried out on Euronext. Euronext Lisbon also uses the clearing facilities of Clearnet. Furthermore, Clearnet, Eurex Clearing and London Clearing House (LCH) have repeatedly explored the possibilities of various merger groupings. Integration in terms of international joint-ventures has also been explored. For instance, the establishment of the European Securities Clearing Corporation (ESCC) as a pan-European clearing house, was set up by Euroclear and the US Government Securities Clearing Corporation (GSCC) to provide trade comparison and netting services for European government debt securities. The LCH has recently joined the venture.

2.2. Monetary policy implications

There are many implications of the interactions between monetary policy and the role of CCPs.

As CCPs have a higher **concentration of risk** than the single participants of a decentralised market, enabling market participants to trade without having to worry about the creditworthiness of individual counterparties is an advantage. While this allows payment systems to function smoothly, it also facilitates the concentration of clearing risks and the possibility of facing larger costs ex post in case a CCP defaults (Section 4).

Clearing service can positively impact the **allocation of capital** within markets, depending by the amount of collateral that has to be pledged. When the level of capital required to support risk management is optimized, counterparties can execute more trades on a given capital base.

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[6] Then two new contracts are created: between the buyer and the CCP, and between the seller and the same central counterparty.

CCPs can contribute to a market's **liquidity** by ensuring post-trade anonymity, keeping the cost of trading as low as possible, reducing overall the risks to the participants. With lower counterparty and liquidity risk and an optimized level of collateral, market participants using a CCP may establish larger positions and trade more. In this respect, a central counterparty can contribute to more stable market liquidity.

As seen during the sovereign debt crisis, however, CCPs can also have a negative impact on a market's liquidity if excessive margin requirements are imposed, with an overall detrimental effect on market activity. That was the case of Spain: days after the country asked for a bailout in June 2012, LCH demanded more money from its members to hold as collateral against the country's government bonds. The increased margin requirement was credited by pushing bond yields to euro-area record levels. This was a case in which the operations of different institutions failed to be aligned. The challenge for CCPs is thus to set the initial margin at a level which is adequate to provide a buffer against unexpected cyclical price movements or change rating, but not as high as to damage market activity or daunt the use of CCPs.

The Financial Stability Board agreed in 2012 that central banks should provide liquidity support to fundamentally solvent CCPs facing temporary liquidity needs. This implies that the ECB effectively serves as a lender of last resort for clearing houses. The ECB may thus be inherently interested in the smooth functioning of euro-clearing procedures from a financial stability view-point. Because clearing houses use payment systems and other infrastructures operated by central banks to carry out their activities, risk management is of vital interest.

Given their role as the lender of last resort, central banks are required to exercise vigilance in all areas that could threaten the viability of the world's financial markets. The ECB therefore may have a core interest in exploring ways in which the increasing use of CCP services alters the distribution of risk as well as it affects the likelihood of systemic risk within the financial system.

There are, finally, less direct links through which the use of CCPs may affect monetary policy as well, such as the link with financial integration. In fact, the existing links between CCPs operating in different countries can foster financial integration across borders. For all those reasons, central banks as well as regulators need to pay particular attention to clearing issues as a part of payments systems.

2.3. Background: The US experience

Clearing and central counterparty services are currently undergoing a process of evolution in both Europe and in the United States. These innovations present numerous challenges. Competing institutional structures coexist in the European and US clearing industries. The financial crisis clearly illustrated that the failure of an important financial institution which is highly interconnected with others can cause problems for the rest of the financial system and negatively impact growth across the wider economy. During the crisis, the problem emerged because a large part of derivatives was traded over-the-counter (OTC): according to BIS figures, in 2008 the amount of outstanding notional OTC equalled 393 trillion dollars compared to an estimated world GDP of 72 trillion dollars.

In 2009, the leaders of the G20 agreed to make a number of reforms to the OTC swaps market.[7] They agreed that standardized swaps would be cleared through central

[7] One of the reasons of this crisis was the role of the over-the-counter swaps market, and in particular credit default swaps. At the time of the crisis, the swaps market was a spider web of bilateral transactions, particularly among the world's largest financial institutions, with no transparency and nothing to ensure adequate capital or collateral requirements. Therefore, a default by one institution could easily lead to a cascade of defaults. This scenario brought global financial companies such as AIG, Bear Stearns, Lehman Brothers to the brink of collapse. The case of AIG is the reason why the derivatives industry is seeking further harmonization: global banks were

clearinghouses, as a way to mitigate and monitor the risk; settle capital and margin–or collateral requirements for un-cleared contracts; standardized swaps would be traded on regulated platforms and that all contracts would be reported to trade repositories, in order to bring transparency and greater integrity to the market.

In July 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act ("Dodd-Frank Act") established a comprehensive new regulatory framework for swaps and security-based swaps. The legislation is enacted to reduce risk, increase transparency, and promote market integrity within the financial system by, among other things: 1) providing for the registration and comprehensive regulation of swap dealers and major swap participants; 2) imposing clearing and trade execution requirements on standardized derivative products; 3) creating robust recordkeeping and real-time reporting regimes; and 4) enhancing the Commission's rulemaking and enforcement authorities with respect to, among others, all registered entities and intermediaries subject to the Commission's oversight.

In Europe, the currently 17 CCPs are regulated since 2012 under the EMIR, the European answer to the US's Dodd-Frank Act (ESMA, 2018).

As a key pillar of EMIR, standardized over-the-counter derivatives contracts must be cleared through a CCP. The EMIR also introduced strict prudential, organizational and business conduct requirements for CCPs and established arrangements for their prudential supervision to minimize any risks to users underpinning systemic stability. Under EMIR, EU CCPs are supervised by national supervisors, ESMA, and other relevant authorities. The scale and importance of CCPs has – in fact – increased following the implementation of the G20 commitment to clear standardized over-the-counter derivatives through CCPs.

European CCPs traditionally confined their services to single countries, establishing infrastructures and services that were tailored to serve best the demands of local markets; each national system thus inevitably developed differently. They offer a multitude of products and asset classes, including securities and derivatives, but the practice is not easily replicable for a US clearing house. The reason for this is that the US regulatory structure has evolved towards supporting a hybrid industry structure, whose regulation is split between the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC). While the market infrastructure (exchanges, clearing houses and settlement) necessary to support trades and market participants active in securities or options are regulated by the SEC, the futures market infrastructure and market participants active in futures are overseen by the CFTC. The Options Clearing Corporation (OCC) is the sole American clearing house operating under the regulation of both the SEC and CFTC. The most significant differences regarding the industry structures that have evolved under SEC and CFTC regulation are attributable to the two authorities' differing approaches to market regulation and oversight.

Cleared volumes are another factor that should be considered when comparing the clearing industries on both sides of the Atlantic. The US domestic securities market is still by far larger than its European equivalent, whereas the same is not true regarding exchange-traded derivatives' volumes: American and European CCPs have long been competing, and the combined market share of their five respective major clearing houses has accounted for roughly 60 to 80 per cent of total worldwide exchange-traded derivatives volumes over the past decade.

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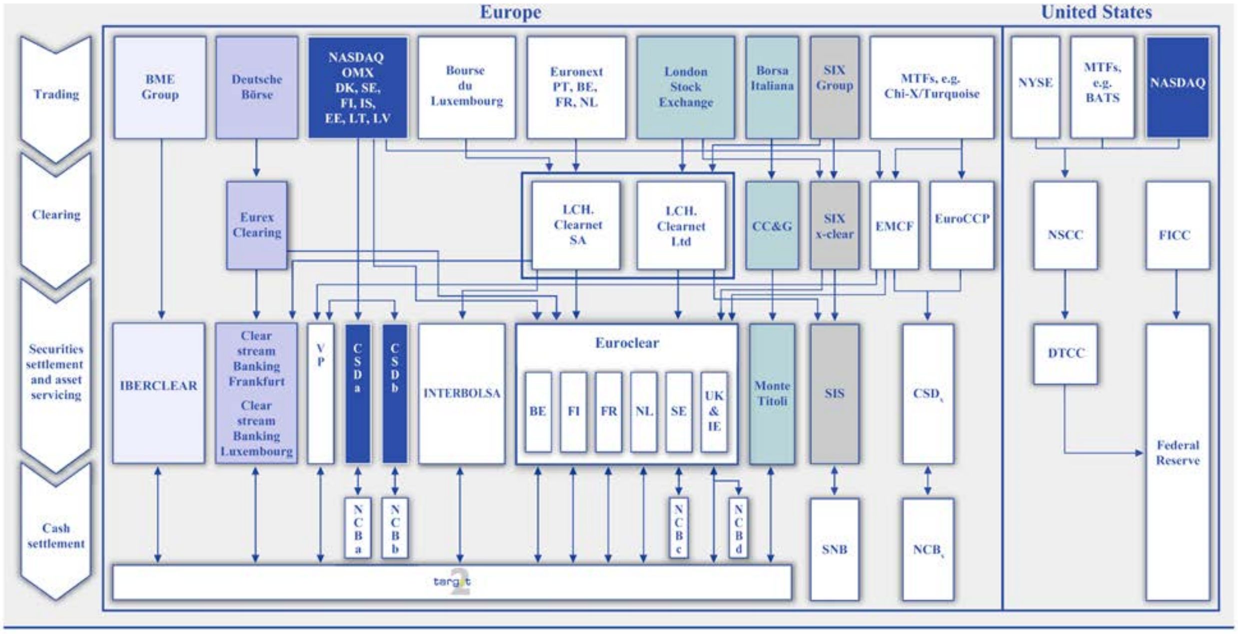
able to transact swaps across borders without worrying about differences in rules, because there were – in fact – no rules to worry about. AIG was able to build up its excessive risk through operations in London into which US regulators had no visibility. Moreover, the crisis spread from its origins in the US mortgage industry in large part because investors around the world purchased mortgage-backed securities and derivatives that were not regulated in the US or in their home countries.

Figure 1: The main securities infrastructure in Europe and the US



Source: ECB (2010).

The rapid growth of cross-border trading, which spans many clearing systems and increases global interdependence, underscores the fact that the clearing industry is ultimately global in coverage. Recent merger and acquisition initiatives among European and American stock and derivatives exchanges are likely to spur further the debate on the efficiency and structure of the European and American clearing industries.

The US and Europe have been cooperating together to restore financial markets' functioning since the crisis. A significant focus of efforts has been that of increasing international coordination and harmonization of the systems. Here, significant progress has been made: for example, collateral requirements were harmonized, including bilateral margin for un-cleared swaps worldwide, as well as clearing requirements. The US and EU reached an agreement regarding the supervision and recognition of clearing houses – one which brought the European and US regulatory regimes closer together – including the mutual recognition between jurisdictions, the establishment of internationally compatible reporting systems and similar regulatory requirements, as well as avoiding excessive costs (Anupam and Randall, 2010).

3. POST-BREXIT EURO CLEARING

KEY FINDINGS

Should euro-clearing leave London, there is no euro-area equivalent of a large centralised clearing services provider like LCH Clearnet.

Besides this specific consultation regarding the UK's EU withdrawal, we believe further concentration of the EU clearing is very likely. In the EU, as well, the existence of economies of scope and of scale will favour the emergence of very large service providers, particularly in the light of the Capital Market Union.

3.1. The role of the UK in euro-clearing and settlement

The vast bulk of euro-denominated derivatives is now cleared in London, with the Bank of England responsible for oversight as well as supervision of the most important market players. This means the ECB, the European NCBs and the euro regulators do not have oversight for that activity, which is crucial, particularly as it relates to monetary policy (Chapter 2.2).

Table 1 lists the centralised counterparties (CCPs) located in the EU. All four UK-based CCPs –the London Clearing House (LCH Clearnet), London Metal Exchange (LME), CME Clear (part of the US headquartered Chicago Mercantile Exchange) and ICE Clearing Europe (part of the US headquartered Intercontinental Exchange) – are recognised by the EU and must comply with the requirements of the EMIR.

Of the four UK-based CCPs, the largest part of euro-denominated trading occurs through LCH Clearnet. LCH Clearnet Group Ltd is a wholly-owned subsidiary of the London Stock Exchange (LSE) and has a subsidiary in France called LCH SA.

3.1.1. The role of the City

London has an unparalleled position in terms of over-the-counter foreign exchange and interest rate derivatives trading, particularly in the euro market (Figure 2) and to a great extent the US dollar market. OTC interest-rate derivatives represent more than two-thirds of the overall OTC derivatives market globally. A majority of the clearing and risk management for Euro-denominated interest rate swaps is currently conducted in London: about 50% of all interest rate swaps settled via CCPs and even 95% of the respective Euro-denominated interest rate swaps are settled at the London Clearing House (LCH) against 13% cleared in Paris and 2% in Frankfurt, according to the Bank for International Settlements' data in 2016. Europe's two major clearing houses are Eurex Clearing owned by Deutsche Boerse and LCH owned by London Stock Exchange (LSE) which is the world's largest clearinghouse with 650 billion in euro derivatives trades daily in 2018.[8]

The UK is the market leader in interest-rate derivatives denominated in euro (75 percent) and pound sterling (95 percent), while the US is the market leader in US dollar denominated interest-rate derivatives (78 percent). Both the UK and the US have increased their positions: almost half of the UK's trade in OTC interest-rate derivatives is denominated in euros (48.6 percent) compared to transactions in pound sterling (4.7 percent) and US dollars (5.4 percent).

The role played by the UK as a centre for both wholesale banking and derivative trading is reflected in the high volumes of claims held by foreign subsidiaries, especially against

[8] https://www.lch.com/services/swapclear/volumes.

counterparties in large EU economies: claims on Spanish counterparties are roughly proportional to its economic size, while claims against the Netherlands and Ireland are very large.

Only about half of UK-owned banks' assets are loans to non-banks (such as non-financial corporations and households). This share is even lower for foreign bank subsidiaries located in the UK, 60 % of whose assets consist of derivatives and other structured products. This reflects the important role the UK financial sector plays in intermediating capital through wholesale funding and securities markets, as reflected by the high volumes of claims held by foreign subsidiaries (Batsaikhan *et al.*, 2017).

Table 2: Clearing and settlement systems in Europe

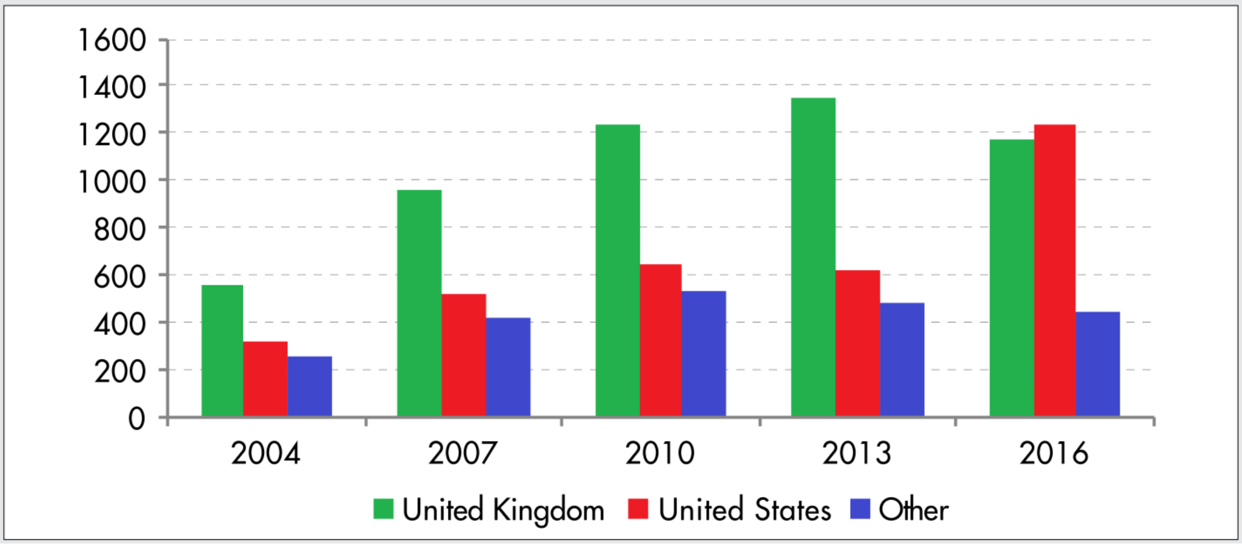
Country/ICSD	Trading	Clearing	Settlement
BE	Euronext Brussels	Clearnet	CIK, NBB SSS
DK	Copenhagen Stock Exchange	FUTOP (derivatives)	VP, FUTOP
DE	8 stock exchanges	Clearstream Banking Frankfurt (no CCP), Eurex Clearing	Clearstream Banking Frankfurt
HE	HELEX Exchanges S.A. HDAT	No CCP for securities, ADECH is CCP for derivatives	BOGS, CSD S.A.
ES	4 stock exchanges, CADE, MEFF	No CCP for securities, MEFacts as CCP for derivatives	SVLV, SCLV, CADE
FR	Euronext Paris	Clearnet	Euroclear France
IE	Irish Stock Exchange		CREST (Euroclear UK)
IT	Borsa Italiana S. p A.	LDT, CCG (but no CCP)	Monte Titoli
LU	Luxembourg Stock Exchange	Clearstream Banking Luxembourg (but no CCP)	Clearstream Banking Luxembourg
NL	Euronext Amsterdam	Clearnet	Euroclear Netherlands
AT	Vienna Stock Exchange, NEWEX	OeKB Clearstream Banking Frankfurt (but no CCP)	OeKB Clearstream Banking Frankfurt
PT	BVLP, MTS Portugal	Interbolsa	Interbolsa, SITEME
FI	HEX	APK (but no CCP)	APK
SE	OM Stockholm Exchange		VPC
UK	9 regulated markets	LCH (CCP), OM	CREST (Euroclear UK)
Clearstream International		Clears and settles securities transactions in 33 markets through a network of links	
Euroclear Bank		Clears and settles securities transactions in 33 markets through a network of links	

Source: Van Cauwenberge (2003).

3.2. Post-Brexit euro clearing

One area which has been recognized as challenging in the light of Brexit is with respect to the regulation of clearing houses. Any SSS/CSD or a CCP can be accessed from non-EU countries. Nevertheless, directly accessing a remote clearing system proves to be a costly approach, as the remote participant has to cope with a specific procedure and interface for each system accessed, with consequent substantial back-office costs.

Figure 2: UK's OTC daily interest rate euro-denominated derivatives turnover, average, US$ billions



Source: Xafa (2017) on BIS (2016) Data.

Note: Germany and France account together for roughly bnl $172 in 2016. Other largely refers to non-EU countries, including Australia, Japan, Hong Kong SAR and Singapore.

The number of remote participants in clearing and settlement systems has gradually risen only over recent years, in spite of the 1993 European Investment Services Directive requiring EU Member States to implement "equivalence" or non-discriminatory access to clearing and settlement systems by remote participants or trading members outside of the EU.

The fact that the largest clearing houses engaging in euro-denominated transactions are located in the UK was a contested issue even before the UK referendum. In 2011, the European Central Bank published a Eurosystem Oversight Policy Framework arguing that large-scale offshore CCPs should be fully incorporated in the euro area with full operational and managerial control. At the time, the ECB 'location policy' framework was criticized by the UK government, which filed a lawsuit before the European General Court in Luxembourg arguing that the requirements violated the free movement of capital in the Single Market. In March 2015, the European General Court ruled in favour of the UK government, concluding that the ECB lacked the necessary competence to regulate securities and clearing systems under the TFEU. In other words, the ECB could not impose location requirements on CCPs involved in clearing securities as these transactions do not constitute part of the payment system.

As a response to this ruling, the ECB and the Bank of England announced that they would extend the scope of their standing swap line in order to facilitate the provision of euro liquidity support to CCPs established in the UK.

3.2.1. The issue of "equivalence" and the UK's access to the EEA

Once the UK will withdraw from the EU, the European law would require the EU to determine that the UK has an "equivalent" regulatory regime for its clearing and trading platforms. This is the same "equivalence" process that applies to other non-EU members, in accordance with Article 25 of EMIR.[9] All third countries' CCPs applying for the right to operate in the EU must be authorised by the European Securities and Markets Authority (ESMA). As of September 2016, the third-country CCPs are established in 15 countries covered by CCP equivalence decisions adopted by the Commission, including Australia, Hong Kong, Singapore, Japan, Canada, Switzerland, South Korea, Mexico, South Africa and the US CFTC, Brazil, UAE, Dubai International Financial Centre (DIFC), India and New Zealand (in accordance with EMIR, the ESMA provides a list of the third-country CCPs that have been recognised to offer services and activities in the Union[10]).

The impact to move the existing clearing houses outside London is ambiguous and estimates vary widely. Ernest & Young estimates that a "total of 10,500 UK financial services jobs, including many front office roles, could be relocated to the continent in time for Day One of Brexit, with Dublin and Frankfurt emerging as the most popular relocation destinations (EY, 2017). The London Stock Exchange warned that banks and investors would have to pay an extra 100 billion dollar over five years to trade off-exchange interest-rate derivatives. That estimate was based on the assumption that fragmenting the work now handled in London by LCH would change the price of every swap, the most popular type of contract, by one basis point. LSE has also cited an estimate that banks would need to increase their collateral or initial margin, by 92 percent (FT, 2016).

The International Swaps and Derivatives Association (ISDA), an industry group, found that margin would have to increase by about 20-30 percent if clearing left London, citing a survey of banks (Boston Consulting Group, 2017). That would equate to 17 billion dollar, according to a calculation by Bloomberg. LCH's largest competitor in the EU, German Eurex Clearing, put the figure at as much as 11% or 9 billion dollar instead of 100 billion dollar as forecasted by LSE (Union Investment, 2017). Scarpetta and Booth (2016), finally, estimate that it will take two and a half to four years to obtain authorisation, which makes it nearly impossible to aim for equivalence authorisation by the time the UK negotiations to exit the EU.

While negotiations on the terms of Brexit may lead to a special status for the UK, it is likely that British financial institutions will lose their "equivalence" status if the country will leave the EEA. Leaving the EEA would mean that the UK would no longer be legally liable to comply to the EMIR framework. Among other things, this implies that derivative transactions conducted in the UK would no longer have to be reported to the ESMA. While it seems highly unlikely that European authorities would allow such a high volume of euro-denominated transactions to be conducted in a country outside of its regulatory jurisdiction, this is certainly one of the main issues post-Brexit.

Failure to be found equivalence status would mean European financial firms will face higher capital charges for transactions cleared in the UK, as it would limit the efficiencies that investors could otherwise obtain by managing euro-denominated transactions with the rest of their portfolios. This could raise costs for businesses transacting in euro-derivatives, and it could consequently affect their location decisions.

There are a few important challenges when it comes to the equivalence status for the UK (Massad, 2017). First, the process for deciding whether to grant equivalence or not cannot start until after the UK withdraws from the EU. **Avoiding potential gaps between exit and**

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9 https://ec.europa.eu/info/sites/info/files/eu-equivalence-decisions-assessment-27022017_en.pdf.

10 www.esma.europa.eu

recognition would be very important at that stage. In so doing, negotiators will be faced with the greatest challenge of agreeing to a process which does not add to the existing uncertainty regarding the post-Brexit scenario. Appropriate transition arrangements will be therefore essential.

Second, there is the issue of whether Europe will be willing to apply the same equivalence framework to the UK as it did with the US or other third- and non-EU countries. Considering the relative importance of the US market to the EU, the EU has negotiated conditions which significantly focused on increasing the international coordination and harmonization of the payment systems (Section 2.3). There are further many other joint international efforts taking place with regard to clearinghouse resilience, standards for data reporting, and in a number of other areas. The London market is obviously even more important to the EU, so agreements in this case could and should take a similar turn, as we shall discuss in the next Section.

4. ASSESSING THE EU PROPOSAL

KEY FINDINGS

At the moment, should euro-clearing leave London, there is no euro-area equivalent of a large centralised clearing services provider like LCH Clearnet.

If Europe insists that clearing of euro-denominated products cannot occur in London, this could also rise to questions as to whether euro-clearing can occur anywhere outside of Europe, including in the United States.

We believe that going forward a joint approach, as is applied currently to EU-based CCPs that operate in the US, could be viable, with the EU and the UK sharing supervisory roles for systematically important extraterritorial CCPs.

More recently, there have been calls to move the clearing of euro-denominated products from London to continental Europe. Calls to change the statute come after the European Commission proposed legislation that would give Brussels the power to force clearers to relocate to the EU's currency area. The revision of EMIR (EMIR II), which covers the oversight of clearers, would give the central bank authority to issue regulations and "ensure efficient and sound clearing and payment systems" both within the EU and "with other countries".[11]

First, when the UK will leave the EU, there will be a question of whether the 2015 European General Court ruling would still apply. Secondly, some of the trading activity conducted by the LCH will certainly relocate to countries within the euro area if the EU will push again for the introduction of 'location requirements' on institutions active in euro-denominated trades. However, even in the absence of such location requirements, clearing houses may choose to relocate some of their trading activity due to uncertainty about the volume of liquidity support that will be provided through ECB-BoE swap lines in the future (i.e. as a response to the General Court ruling in 2015, the ECB and the Bank of England agreed over a euro-sterling swap line; that agreement, which also includes a commitment from the Bank of England to share information with the ECB, is governed by EU law and will need to be renegotiated), or simply higher costs.

The Commission's proposal makes relocation of large clearing houses as a last resort possibility, to apply only should the EU and the UK authorities will fail to come to an agreement on "enhanced supervision" of CCPs based in London. The US dollar is equally cleared outside the US, but American authorities have more direct oversight of London-based clearing houses. The ECB believes the change to its statute is needed to comply with the European Commission proposals, since the TFEU does not permit the ECB to take over direct oversight of euro clearing. The change – if approved – would give the ECB more power to manage the provision of liquidity to financial markets in the event of problems emerging at a clearing house. Under the new EU proposals, power over any decision to force a clearing house to relocate would simply lie within the ECB and the ESMA.

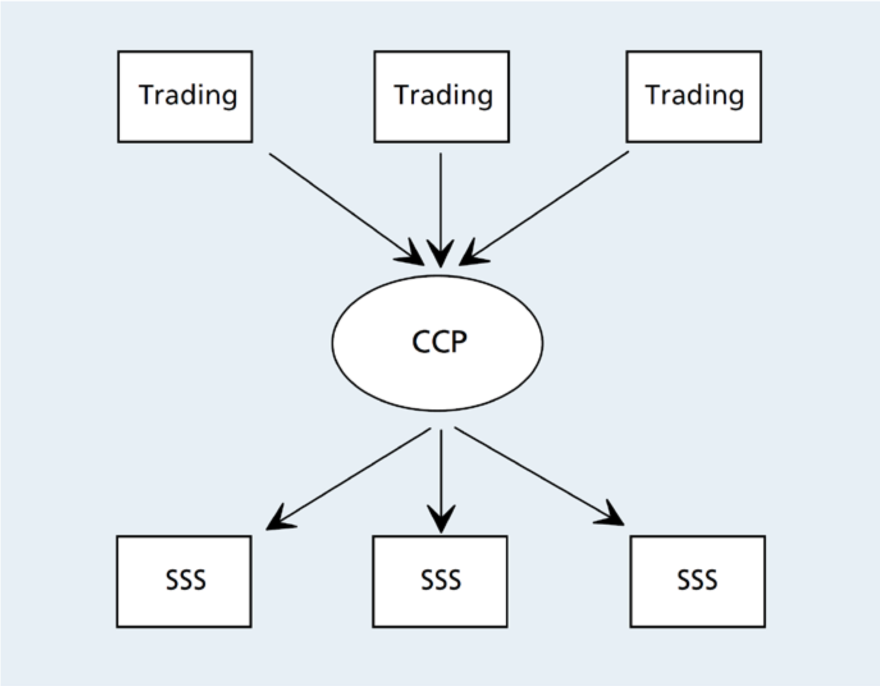
What does the Commision's proposal imply? In a nutshell, that each currency zone needs its "own" clearing house. This will be important mainly in the light of the upcoming Capital Market Union for Europe (Xafa, 2017), above and beyond Brexit.

As a corollary of the increasing internationalisation of trade, there is pressure to speed up integration at the clearing level as well, with investors demanding sound and efficient post-trade vehicle of cross-border securities transactions. Discussions on the integration of clearing activities within the market are focusing on issues related to governance, jurisdiction,

[11] http://eur-lex.europa.eu/procedure/EN/2017_136.

legal status and types of products. In particular, it is not clear at this stage whether CCP services should be provided through a single entity or through multiple entities across product lines and markets, with multicurrency capability, such as CLS, and consequently how many jurisdictions will be involved. When accessing several systems, a participant wants the system interfaces and procedures to be as harmonised as possible, so to minimize costs. In the current EU environment, several clearing systems are in operation, and the objective will not be easy to achieve.

Figure 3: The "one CCP for the EU-zone"-proposal



Source: Van Cauwenberge (2003).

Besides this specific consultation regarding the UK's EU withdrawal, further concentration of the EU clearing is very likely. One may again refer to the US experience, where the equities markets moved from a system of seven CSDs owned by exchanges to one CSD and one CCP, so that clearing and settlement for the US equities markets now takes place through the single facilities of the Depository Trust & Clearing Corporation (DTCC).[12] We believe, **in the EU, too, the existence of economies of scope and economies of scale may favour the emergence of larger service providers**.

Horizontal integration of the type envisaged by the Commission will make it possible to clear all trades in the same place. While the driving forces behind the consolidation process are clear, it is difficult at this stage to determine a priori in which direction this process will evolve, as it will largely depend on the UK's possibility to retain access to the EEA.

A single CCP, interposing itself between the buyer and the seller, can act as a pivot connecting several domestic markets and several domestic SSSs. In principle, one or several such CCPs

[12] As discussed, separate facilities exist for other categories of products. US government bond transactions are mainly settled through two big US-based custodian banks. Separate single facilities also exist for mortgage bonds and exchange traded options.

could co-exist. A “one CCP for the EU-zone”- project was first presented in the European Securities Forum (2000) paper and it is summarized in Figure 3 (Van Cauwenberge, 2003).

Importantly, when dominant structures emerge, there should be a clear risk management structure. First, the industry should be properly organised, guaranteeing strict conditions of access while opening all other aspects to competition. Second, adequate governance structures should ensure that the interests of users are genuinely taken into account, so that new costs do not arise.

Particularly, among the specific issues arising, when an individual system grows or when systems integrate, the probability of disruption may well decrease but its potential impact on systemic stability could become much more important (Van Cauwenbergem, 2003). At the same time, it could be argued that an integrated infrastructure will imply fewer service providers, and that it will be easier for the supervisor to monitor such a system. Hence, despite the appeal, equally from a risk management point of view, it is clear that any further concentration of CCPs, or even a single CCP for the EU, would concentrate clearing risks and increase the impact of a default by the clearing house.

At the moment, should euro-clearing leave London, there is no euro-area equivalent of a large centralised clearing services provider like LCH Clearnet. At present, the largest CCPs in the euro area are Eurex Clearing in Germany, the LCH Clearnet Group owned LCH SA in France, EuroCCP in the Netherlands and CCG in Italy. However, these large euro-area CCPs are limited in their coverage.[13] **One of the main recipients of London's euro-denominated clearing business could potentially be Eurex in Germany, supervised by the German Central Bank (Bundesbank) and the ESMA.**[14]

4.1. Should euro-clearing happen outside of the EU?

If Europe insists that clearing of euro-denominated products cannot occur in London that could also rise to questions as to whether euro-clearing can occur anywhere outside of Europe, including in the United States. This could lead to other countries considering whether to adopt similar policies regarding clearing of products in their own currencies.

The volume of euro-denominated products cleared in the US is quite small but the volume of dollar denominated derivatives clearing that takes place in London is very large. The CFTC has never insisted that dollar-denominated products be cleared in the US. However, the US, differently from the EU, requires overseas clearinghouses that do substantial US business to register there and provide access just like any other US-based clearinghouse. This framework gives the US the ability to oversee what is going on at such foreign clearinghouses. The US has oversight of major London clearinghouses as a result.

We believe that going forward a joint approach, as is applied currently to EU-based CCPs that operate in the US, could be viable, with the EU and the UK sharing supervisory roles for systematically important extraterritorial CCPs, as others have also suggested (Batsaikhan *et al.*, 2017; Sapir *et al,* 2017).

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13 EuroCCP only clears securities and LCH SA France and CCG in Italy only clear euro-denominated products.

14 Eurex is a multi-currency clearing house that clears across derivatives, securities and repos, but its clearing volumes are still smaller than those of LCH Clearnet. For instance, in terms of euro-denominated OTC derivatives, LCH Clearnet's notional outstanding clearing volumes are more than five times those of Eurex.

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