Collateral transactions and shadow banking

Spence, R.

1 Introduction

In the years leading up to the 2007/2008 Global Financial "Crisis, structural vulnerabilities had built-up in the global financial system. Complex financial products with long intermediation chains and misaligned incentive structures led to an accumulation of exposures that were poorly understood and managed across the system… [As a result,] many institutions did not fully understand their own risk exposures" and in particular, regulators failed to govern the financial system and neglected to exercise proper supervision and oversight of financial institutions.[1] Complexity and opacity therefore became pervasive and the financial system as a whole became riskier as a consequence.[2]

The Global Financial Crisis has therefore had a profound influence on the global financial system. Significant fault lines were exposed, risks and structural vulnerabilities had built-up, and specifically, the crisis highlighted the growing importance of the so-called 'shadow banking sector'. The term 'shadow banking' can broadly be described as a sector that provides an alternative source of funding to that offered by the traditional banking sector, but without being subject to prudential regulation. It is indeed noteworthy that numerous empirical studies demonstrate that since before the Global Financial Crisis, the size of the European Union ("EU") shadow banking sector has grown rapidly to now become the primary funding source for market participants in the EU.[3]

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1 Paul Krugman has argued that the lack of controls during the Global Financial Crisis amounts to "malign neglect" – see P Krugman, *The Return of Depression Economics and the Crisis of 2008* (2009) 162-163. See also, D Domanski, "Achieving the G20 goal of resilient market-based finance" (2018) *22 Banque de France Financial Stability Review* 155 at 156.

2 See generally, Domanski (n 1) at 155-165.

3 See generally, European Systemic Risk Board, "EU Non-bank Financial Intermediation Risk Monitor" (2019), available at: https://www.esrb.europa.eu/pub/pdf/reports/esrb.report190717_NBFImonitor2019~ba7c155135.en.pdf. See also, M Hodula, "Monetary Policy and Shadow Banking: Trapped between a Rock and a Hard Place" (2019) *5 Working Paper Series Czech National Bank;* Financial Stability Board, "Shadow Banking: Strengthening Oversight and Regulation" (27 October, 2011); R Davies, "The Moonshine of our Times: The Global Rise of Shadow Banking" (2015) *The International Economy* 70 at 71; S Pearlstein quoting Federal Reserve Chair Jerome H Powell, "The shadow banks are back with another big bad credit bubble" (31 May, 2019) *Washington Post;* S Gebauer and F Mazelis, "Macroprudential regulation and leakage to the shadow banking sector" (May, 2020) *2406 ECB Working Paper Series*, available at: https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2406~af673f115a.en.pdf.

Importantly, such growth highlights the strength of the shadow banking sector and its concomitant benefits to the overall economy. For example, an advantage to shadow banking is that it reduces the dependency on the traditional banking sector as the only source of credit. In order to provide an alternative source of funding to the economy, the shadow banking sector "performs bank-like functions" by transforming long-term risky assets (such as bonds) into short-term safe assets (such as cash).[4] This is a positive benefit for the economy because the shadow banking sector does not only provide financial diversification, it also facilitates liquid and efficient markets, which is crucial for an effective economy. As such, the shadow banking sector provides a functionally equivalent service to that offered by the traditional banking sector but does so without being subject to the costly and burdensome prudential regulation.[5]

The shadow banking sector is not solely beneficial however; it is also a sector that can undermine financial stability given its relationship with systemic risk.[6] We were reminded during the Global Financial Crisis of how the traditional banking sector has direct and explicit access to official credit and liquidity backstops. It was however a different story for the shadow banking sector, which is not subject to prudential regulation and consequently does not have explicit access to this type of backstop. Liquidity support is therefore less assured and funding can be quick to flee.[7]

Pertinent for this study is the shadow banking sector's use of collateral transactions, namely repurchase agreements ("repos"), securities lending and derivative transactions, and the role financial collateral and margin play therein. The shadow banking sector utilises collateral transactions to intermediate credit throughout the financial system and build-up leverage by way of, *inter alia,* maturity transformation – transforming long-term securities, such as government bonds, which are used as financial collateral to secure short-term funding.[8] It is this maturity transformation function that renders the shadow banking sector intrinsically fragile since, by definition, a leveraged

4 Financial Stability Board (n 3) 1 at 1.

5 E Perotti, "The roots of shadow banking" (2013) *69 CEPR Policy Insight* 1 at 2.

6 M Hodula, "Off the Radar: Exploring the Rise of Shadow Banking in the EU" (2018) *16 Working Paper Series Czech National Bank* 1 at 3.

7 However, as will be discussed below, the shadow banking sector may now have an implied backstop. On this, see Chapter 2, section 3.2.1.3. See also, R Foroohar, "How the virus became a credit run" (16 March, 2020) *Financial Times* 1 at 17; *The Economist,* "Repo-market ructions were a reminder of the financial crisis" (26 September, 2019); G Tett, "The repo markets mystery reminds us that we are flying blind" (19 September, 2019) *Financial Times,* available at: https://www.ft.com/content/35d66294-dadc-11e9-8f9b-77216ebe1f17; S C Keiger, "Reducing the Systemic Risk in Shadow Maturity Transformation" (8 March, 2011) *Federal Reserve Bank of New York – Remarks at the Global Association of Risk Professionals 12th Annual Risk Management Convention, New York City.*

8 G B Gorton, *Misunderstanding Financial Crises: Why We Don't See Them Coming* (2012) 43.

market participant engaging in maturity transformation cannot honour a sudden request for full withdrawals.

As the name implies, collateral transactions are 'secured' with financial collateral to hedge default risk. Financial collateral is therefore a safety net implying that should default occur, the collateral can be liquidated to make good on the initial promise.[9] To mitigate the risk that the financial "collateral falls below the notional amount of the transaction, the market standard" is to overcollateralise the transaction such that 'excess' financial collateral ('margin') covers net exposures from one party to another party.[10] However, as illustrated by the Global Financial Crisis and the more recent effects on financial markets due to the Covid-19 pandemic, when asset prices fall, margin levels increase and highly leveraged financial institutions are forced to de-leverage, causing market participants to 'run' in advance of other market participants motivated to do exactly the same thing.[11] Consequently, a "vicious cycle can emerge where lenders raise margin levels thereby demanding more financial collateral, forcing de-leveraging and more asset sales at fire sale prices and thus further price declines", eventually generating a downward leverage and liquidity spiral.[12] This is what Professors Gary Gorton and Andrew Metrick called "the run-on repo" during the Global Financial Crisis.[13] The source of this instability is a recurring phenomenon involving

9 A M Pacces and H Nabilou, "The Law and Economics of Shadow Banking" (2017) *ECGI Working Paper Series in Law* 1 at 11-12.

10 European Systemic Risk Board, "ESRB opinion to ESMA on securities financing transactions and leverage under Article 29 of the SFTR" (October, 2016) 1 at 4. See also, Paragraphs 2 (aa) and (bb) GMRA 2011.

11 H McVea, "Targeting hedge funds and 'repo runs'", in I H Y Chiu and I G MacNeil, *Research Handbook on Shadow Banking Legal and Regulatory Aspects* (2018) 177 at 195. See also, Foroohar (n 7) 1 at 17; European Systemic Risk Board, "Liquidity risks arising from margin calls" (June, 2020) 1 at 2-4, available at: https://www.esrb.europa.eu/pub/pdf/reports/esrb.report200608_on_Liquidity_risks_arising_from_margin_calls_3~08542993cf.en.pdf; Bank for International Settlements, "Containment Measures: Policy Interventions" (June, 2020) *Annual Economic Report* 1 at 44, available at: https://www.bis.org/publ/arpdf/ar2020e.pdf.

12 The leverage and liquidity spiral will be discussed in greater detail in Chapter 6, section 5.2. See also, V Constancio, "Margins and haircuts as a macroprudential tool" (6 June, 2016) Vice-President of the ECB, at the *ESRB international conference of the macroprudential use of margins and haircuts*, available at: https://www.esrb.europa.eu/news/speeches/date/2016/html/sp160606.en.html; R Comotto, "Repo: guilty notwithstanding the evidence?" (25 April, 2012) *International Capital Markets Association*, available at: https://www.icmagroup.org/assets/documents/Maket-Practice/Regulatory-Policy/Repo-Markets/Comotto%20-%20repo%20haircuts%20April%202.pdf; R Spence, "The Vulnerabilities of Debt in the Shadow Banking Sector" (28-29 October, 2019) Financial Stability Conference Paper, Berlin 1 at 27, available at: http://financial-stability.org/wp-content/uploads/2019/11/2019_FSC-WS_PAPER_Spence_Vulnerabilities-of-debt-in-the-shadow-banking-sector.pdf.

13 G B Gorton and A Metrick, "Securitized Banking and the Run-on Repo" (2009) *15223 NBER Working Paper Series.* See also, G B Gorton and A Metrick, "Who Ran on Repo?" (2012) *18455 NBER Working Paper Series.*

the build-up of leverage that makes the economy particularly vulnerable to financial crises.[14]

Crises do tend to come at a great cost to society. As such, the key objective should therefore be focused on how best to comprehensively "strengthen the oversight and regulation" of the shadow banking sector to make it more robust.[15] In an attempt to facilitate regulation and transform the shadow banking sector into a "resilient market-based financial system", numerous publications, policy proposals and EU legislative instruments have been published.[16] While it is a truism that regulating the EU shadow banking sector is a gargantuan task, and given the efforts of EU authorities over the last decades, one would expect a convincing regulatory result.[17] Sadly, the reality is less compelling given that the regulatory response has, to date, been piecemeal at best.[18]

1 Problem Statement

The aforementioned risks and vulnerabilities stemming from the shadow banking sector are indeed a serious cause of concern. The adverse effects that the shadow banking sector had on society during the Global Financial Crisis was catastrophic. Because the shadow banking sector can undermine financial stability and exacerbate systemic risk, precisely because it is a sector (arguably) not subject to appropriate oversight and regulation, the concern is that should another crisis ensue, the cost to the economy and particularly the negative externalities, could again re-appear at a greater cost to society.[19] This issue becomes particularly precarious when we discover, not unsurprisingly that the next crisis is imminent, taking account of two (more) recent events. Firstly, on 15 September 2019, the repo market suffered a severe "ruction" where leveraged market participants were forced to deleverage due to a sudden demand for cash. Understandably, this resulted in a severe spike in the 'repo

14 M K Brunnermeier and Y Sannikov, "The I Theory of Money" (2016) *Princeton University* 1 at 44.

15 See generally, Financial Stability Board (n 3). See also, Financial Stability Board, "Strengthening Oversight and Regulation of Shadow Banking: Policy Framework for Addressing Shadow Banking Risks in Securities Lending and Repos" (29 August, 2013).

16 See generally, Financial Stability Board, "Transforming Shadow Banking into Resilient Market-based Finance: Regulatory framework for haircuts on non-centrally cleared securities financing transactions" (12 November, 2015 (updated on 19 July, 2019 and 25 November, 2019)).

17 See generally, Financial Stability Board (n 3). See also, Financial Stability Board (n 15).

18 See generally, Financial Stability Board (n 16).

19 M A van Dijk, "The Social Costs of Financial Crises" (2013) *Erasmus University Rotterdam* 1 at 16.

rate'.[20] The US Federal Reserve succeeded in taming uncertainty by pumping USD $75bn into the financial markets for several days.

Secondly and more significantly, at the time of writing[21] the financial markets are again experiencing significant repercussions regarding the Covid-19 pandemic.[22] While it remains to be seen the extent of the economic impact of Covid-19, the European Systemic Risk Board has commented that the "coronacrisis… is causing a sharp drop in asset prices and increased volatility, resulting among others in significant margin calls across centrally cleared and non-centrally cleared markets… Going forward, these could have major implications for the liquidity management and funding needs of counterparties and possibly even their solvency in a scenario where liquidity stress leads to systemic fire-sales".[23] It is notable that in both events outlined above, leveraged financial institutions are being forced to deleverage to acquire liquidity, much like the situation that occurred in 2007/2008.[24]

These events do highlight significant concerns relating to financial stability in the EU shadow banking sector that are still not adequately addressed. In particular, it has been noted that rising margin levels are a systemic indicator and often the catalyst for future volatility.[25] Specifically, margin calls are associated with periods of financial stress, necessitating substantial reductions in leverage, which ultimately induces parties to run.[26] To demonstrate, consider a situation where the financial sector is "awash with liquidity", meaning that funding is plentiful.[27] When liquidity is easy to come by, during 'boom' periods, the outcome is high levels of leverage. Now consider a situation, outlined in *Figure 1* below, where a buyer and seller enter into a repo transaction.[28]

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20 The 'repo rate' will be discussed in greater detail in Chapter 5, section 3.3.3.

21 15 January, 2021.

22 The Economist (n 7). See also generally OECD, "The impact of the coronavirus (COVID-19) crisis on development finance" (24 June, 2020), available at: https://read.oecd-ilibrary.org/view/?ref=134_134569-xn1go1i113&title=The-impact-of-the-coronavirus-(COVID-19)-crisis-on-development-finance.

23 European Systemic Risk Board (n 11) 1 at 2-4. See also, Bank for International Settlements (n 11) 1 at 44.

24 Foroohar (n 7) 1 at 17.

25 M K Brunnermeier, "Deciphering the Liquidity and Credit Crunch 2007-2008" (2009), *23 (1) Journal of Economic perspectives* 77 at 94.

26 T Adrian and H S Shin, "The Shadow Banking System: Implications for Financial Regulation" (July, 2009) *382 Federal Reserve Bank of New York* 1 at 9.

27 See M Brunnermeier, "Financial Crises: Mechanisms, Prevention and Management" in M Dewatripont, X Freixas and R Portes (eds.) *Macroeconomic Stability and Financial Regulation: Key Issues for the G20* (2009) 91 at 92.

28 It should also be noted that this example could also be a securities lending or derivatives transaction. The graphical illustration is similar to, but different from, that found in A M Pacces, *The Role of the Future in Law and Finance* (2017) 6.

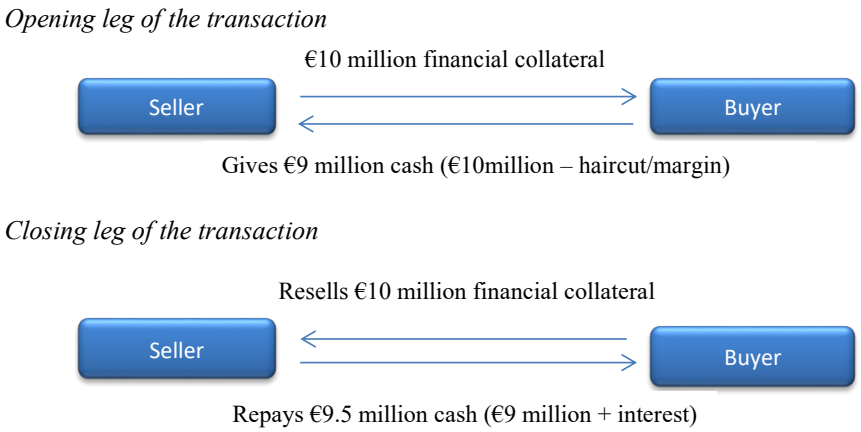

Figure 1: Repo Transaction

This repo transaction gives the seller € 10 million in cash on 10% margin.[29] Therefore, the seller has to fund € 1 million with its own capital and borrows € 9 million from the buyer. Margin is therefore the reciprocal of leverage. A higher level of margin indicates a lower leverage and a lower level of margin indicates a higher leverage. In order to secure the repo transaction, the seller provides the buyer with € 10 million worth of securities as financial collateral to hedge default risk. On maturity, the buyer will return equivalent financial collateral whilst the seller simultaneously returns principal plus interest. However, suppose that prior to maturity of the repo transaction, there is an adverse shock within the financial system, similar to that of 15 September 2019 or the current economic impact in relation to Covid-19 (or indeed Lehman Brothers in 2008).

Such an adverse event will potentially have four significant and simultaneous consequences on the whole financial system.[30] The first consequence of the adverse shock is the market risk arising from plummeting asset prices. Because the market shock directly translates to a decline in the value of the financial collateral, there is significant risk that the buyer may become *under-collateralised* (rather than overcollateralised). As such, there is a potential immediate impact on the seller's inability to fulfil their obligation under the repo transaction because the buyer will automatically trigger the seller to post additional financial collateral (via way of margin calls), who may or may not have the means to do so.

29 As will be discussed in subsequent chapters, the precise terminology is either 'haircut' or 'initial margin'. For the purpose of this example, the term 'margin' will be used.

30 These four consequences are also discussed in Spence (n 12) 1 at 25-27. See also, M Haentjens (ed), Y Diamant, J Siena, R Spence and A Zacaroli, *Financial Collateral: Law and Practice* (2020) 111-113.

The second consequence is the response by the buyer. The buyer will want to ensure that they do not end up in a worse financial position. Consequently, the buyer will safeguard their financial position by accepting the additional posted financial collateral and increasing the margin on the repo transaction. This has two significant repercussions. Firstly, the adverse shock will immediately reduce funding liquidity. Funding liquidity is a term used to illustrate the ease with which market participants can raise funding.[31] Consequently, the adverse shock will make the buyer extremely cautious, who will either tighten funding or become unwilling to extend new funding into the marketplace. This will adversely affect liquidity, investment and economic growth in the real economy because if lenders are unwilling to lend, then liquidity will start to dry-up. Secondly, assets will start to be bought and sold at fire sale prices, which will further depress the asset prices. For example, the seller will have to legally provide additional financial collateral to the buyer in order to fulfil its obligation under the repo transaction; equally, the buyer may want to liquidate its own position to minimise loss.[32]

The third consequence is the downward price spiral. As the fire sale ensues, the price of the assets being bought and sold will decline in value, resulting in further losses. This triggers further fire sales and a rise in risk premiums because financial market actors will want to ensure that they either minimise loss or maximise profits.

The fourth and final consequence is a reduction in market liquidity. Market liquidity relates to the ability of buyers and sellers of securities to transact speedily and efficiently without causing drastic change in the price of the assets.[33] The buying and selling enjoyed prior to the adverse shock will be low because it will be difficult to trade in an overly cautious marketplace. Liquidity can, therefore, be said to have 'evaporated' in that the shock has caused a leverage and liquidity spiral. This spiral has caused liquidity to dry-up and amplify a domino like chain of events that can potentially lead to a full-blown financial crisis.[34]

Given the inability of market participants operating in the EU shadow banking sector to internalise the costs associated with a negative impact like that outlined above, commentators argue there is "a *prima facie* justification for regulatory intervention… in order to prevent more widespread" market failures.[35] For the traditional banking sector, public sector intervention comprises deposit insurance, lender of last resort and an evolving body of prudential regulation. However, comprehensive regulation akin to that found

31 For a more in-depth analysis of 'funding liquidity', see Chapter 3, section 2.3.2.

32 European Systemic Risk Board (n 11) 1 at 2-4. See also, Bank for International Settlements (n 11) 1 at 44.

33 For a more in-depth analysis of "market liquidity", see Chapter 3, section 2.3.1.

34 Brunnermeier (n 25) at 91-94. See also, M K Brunnermeier and L H Pedersen, "Market Liquidity and Funding Liquidity" (2008) *The Society for Financial Studies* 1 at 3-7.

35 McVea (n 11) 177 at 182.

in the traditional banking sector has yet to find its way into the shadow banking sector. The real challenge for the shadow banking sector, then, as it was in the past for the traditional banking sector, is to prevent runs whilst ensuring an efficient credit supply.[36] The question therefore arises: how should regulators tame financial uncertainty and address systemic risk within the EU shadow banking sector?[37] It has been noted that leverage has been at the heart of many past financial crises.[38] This thesis will therefore argue that restricting leverage should be considered paramount. Importantly, margin is a mechanism that directly limits the amount of leverage a financial institution can obtain, and according to David Longworth:

> *"New regulations for margin requirements and haircuts are needed to dampen financial booms and busts".*[39]

Yet it should also be noted that regulating margin is a solution that does not come without risk. The success of regulation will depend upon its impact on the negative externalities that are generated within the shadow banking sector, particularly on the extent to which regulation forces shadow banks to internalise these externalities and at which cost.[40] Therefore, any new recommendations should be weighed and calibrated to ensure that benefit is maximised and risk minimised. Overly restrictive measures would undoubtedly result in stifling liquid and efficient markets as well as facilitating market participants to conduct regulatory arbitrage.

2 Research Questions

Based on the above problems and the potential contribution margin has in undermining financial stability, the central question of this thesis is:

36 J Benjamin, G Morton and M Raffan, "The future of securities financing" (2013) *7 Law and Financial Markets Review* 4 at 4.

37 European Systemic Risk Board (n 11) 1 at 2-4. See also generally, European Systemic Risk Board, "The macroprudential use of margins and haircuts" (2017); S L Schwarcz, "Regulating Shadow Banking" (2012) *31 Review of Banking & Financial Law* 619; J Armour, D Awrey, P Davies, L Enriques, J N Gordon, C Mayer and J Payne, *Principles of Financial Regulation* (2016) 3; A G Balmer, *Regulating Financial Derivatives: Clearing and Central Counterparties* (2018) 5.

38 V Constancio (n 12). See also, M Schularick and A M Taylor, "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises 1870-2008" (2012) 102 (2) *American Economic Review* 1029-1061.

39 D Longworth, "Warding Off Financial Market Failure: How to Avoid Squeezed Margins and Bad Haircuts" (2010) 135 C.D. Howe Institute Backgrounder 1 at 1.

40 Brunnermeier (n 27) 91 at 92.

"How should mandatory margin requirements operate, from a legal and economic perspective, in the EU shadow banking sector?"

To comprehensively answer the central research question requires an understanding of how margin *does* currently operate as well as an understanding of how margin *should* operate. As such, the central research question will be aided by four sub-questions:

1. *What is shadow banking, financial collateral and margin and how do they inter-relate?*
2. *Why have margin requirements and what purpose do they serve?*
3. *What is the current legal and regulatory framework in the EU for mandatory margin requirements?*
4. *How* should *margin requirements operate in the EU?*

Sub-question one asks "what is shadow banking, financial collateral and margin and how do they inter-relate?". In order to have an understanding of the role margin plays in the broader EU shadow banking sector, at the outset, it is first crucial to have an understanding of the key components, namely shadow banking, financial collateral and margin.

Sub-question two will explore the economic rationale for margin requirements and asks "why have margin requirements and what purpose do they serve?". In a collateral transaction, margin is an important risk mitigation tool that provides market participants with a crucial safety net used to hedge risk on the financial collateral by overcollateralising the transaction. However, it should also be noted that while margin is principally in place to mitigate risk, it is paradoxically a procyclical mechanism that is itself a source of systemic risk.

Sub-question three will explore and critically analyse "the current legal and regulatory framework in the EU for mandatory margin requirements". The legal underpinnings are principally in the form of industry standard master agreements, such as the Global Master Repurchase Agreement ("GMRA") for repos, the Global Master Securities Lending Agreement ("GMSLA") for securities lending transactions and the Credit Support Annex under the International Swaps and Derivatives Association ("ISDA") master agreement.

In terms of regulatory underpinnings, collateral transactions conducted in the EU shadow banking sector have several touchpoints and, where necessary, a critical analysis will be conducted into the following EU regulations and directives:

- European Market Infrastructure Regulation[41] ("EMIR") and the accompanying Regulatory Technical Standards[42] ("RTS");
- Securities Financing Transactions Regulation[43] ("SFTR");
- Financial Collateral Directive[44] ("FCD");
- Alternative Investment Fund Managers Directive[45] ("AIFMD");
- Undertakings for Collective Investment in Transferable Securities Directive[46] ("UCITS");
- Markets in Financial Instruments Directive II[47] ("MiFID II"); and,
- The evolving body of prudential regulation.[48]

Sub-question four asks the normative question of "how *should* margin requirements operate in the EU?". Because leverage has been at the heart of many past financial crises, finding a solution to limit leverage is of central importance. Margin has the ability to limit leverage, however it is a mechanism that

41 Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivative, central counterparties and trade repositories ("EMIR").

42 Commission Delegated Regulation (EU) 2016/2251 of 4 October 2016 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories with regard to regulatory technical standards for risk-mitigation techniques for OTC derivative contracts not cleared by a central counterparty ("RTS").

43 Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012.

44 Directive 2002/47/EC of the European Parliament and of the Council of 6 June 2002 on financial collateral arrangements as amended by Directive 2009/44/EC of the European Parliament and of the Council of 6 May 2009 amending Directive 98/26/EC on settlement finality in payment and securities settlement systems and Directive 2002/47/EC on financial collateral arrangements as regards linked systems in credit claims ("FCD").

45 Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010 ("AIFMD").

46 Directive 2014/91/EU amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities as regards depository functions, remuneration policies and sanctions ("UCITS").

47 Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU ("MiFID II").

48 In particular, EU measures implemented under the Basel Accords, including the Capital Requirements Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending regulation (EU) No 648/2012 (OJ L 176) ("CRR"); see also, Bank Recovery and Resolution Directive 2014/59/EU of the European Parliament and of the Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms and amending Council Directive 82/891/EEC, and Directives 2001/24/EC, 2002/47/EC, 2004/25/EC, 2005/56/EC, 2007/36/EC, 2011/35/EU, 2012/30/EU and 2013/36/EU, and Regulations (EU) No 1093/2010 and (EU) No 648/2012, of the European Parliament and of the Council ("BRRD").

is not subject to adequate regulation. This sub-question will therefore explore the various options in relation to the optimal operation of margin in the EU shadow banking sector from both a legal and economic perspective.

3 METHODOLOGY

The methodology of this research is driven by the central research question and the various sub-questions. Both a positive and normative methodology will therefore be employed. Before providing an answer to the central research question, which is normative in the sense that it asks how margin *should* operate, it is first crucial to understand how margin *does* currently operate in the EU shadow banking sector. It is important, then, to first describe "what is" in order to determine "what ought to be".[49]

Since this research is interdisciplinary in nature, being at the intersection of law and economics, the primary research method of this thesis will be a traditional theoretical analysis. This will involve exploring and critically analysing (published) literature, particularly in relation to the legal, economic and societal implications of shadow banking, financial collateral and margin. This means that the thesis will begin by adopting a positive methodology by exploring the issue of how *does* margin operate in the EU shadow banking sector from both a legal and economic perspective. As such, the findings presented in Chapters 1-7 are predominantly based on a factual analysis of published (legal and economic) literature, policy proposals and EU legislation. Chapter 8 will adopt a normative approach by providing several solutions to how margin *should* operate in the EU shadow banking sector. Along with the ideas and arguments put forward in this thesis, a general analysis of regulation and prescriptive literature, as well as published guidelines and recommendations issued by international financial institutions and EU organisations will be largely relied upon for the normative part of the research.

Within the positive framework outlined above, an empirical research method has also been employed, specifically in relation to Chapters 2 & 3. In particular, a qualitative research method was relied upon by conducting one-on-one interviews with a specific target audience (two face-to-face interviews and one telephone interview). Because there is a severe lack of granular data in the EU shadow banking sector, this research method enabled the collection of meaningful data/information, based on open ended questions, on the role financial collateral and margin play in the EU economy. The interviewees (one prominent practitioner and two industry experts) have specifically asked for confidentiality and in order to respect this, they will not be explicitly

49 V K Dibble and B Pekowsky, "What Is and What Ought to Be: A Comparison of Certain Characteristics of the Ideological and Legal Styles of Thought" (1973) *79 (3) American Journal of Sociology* 511-549.

named but rather generically referred to as "interviewee #1" etc. for citation purposes.

4 Scope and Limitations of Research

This study will focus on collateral transactions within the EU shadow banking sector from both a legal and economic perspective. Based on the focus of this study, there are several noteworthy limitations regarding scope. Each will be discussed in turn. Firstly, the legal and economic analysis of this research will be confined to the EU as a whole rather than a comparative analysis based on selected EU jurisdictions. This broad EU approach has been adopted because margin is a global issue that can have systemic implications on the entire financial system. To confine the research to a few selected jurisdictions would therefore have no practical relevance considering the view to expand the EU macroprudential (rather than microprudential) regulatory toolkit in relation to margin. Additionally, the EU has been chosen as this is where the research has been conducted and the author of this thesis is trained in EU law. However, it should be observed that in selected parts of this thesis, and where relevant, a comparison has been made with the United States of America ("USA"), albeit to a limited extent.

Secondly, this research is interdisciplinary in nature, specifically focusing on law and economics. From a legal perspective, financial law is a "functional, pragmatic and non-dogmatic" area of law.[50] As such, a practical approach is key. This study will focus on public and private law rules as laid down in EU regulations and directives, as well as exploring the legal and practical relevance of the industry standard master agreements. From an economic perspective, the growing importance of financial globalisation demonstrates the increasing global linkages created through cross-border financial flows. Financial markets are therefore not confined to a single jurisdiction but are largely interconnected. Therefore, the operation and regulation of margin relates not only to financial law but also economic perspectives and this study has the ambition to bring these perspectives together.

Thirdly, I have chosen a functional definition of shadow banking, which I understand to include the following transactions: repos, securities lending and derivatives. As such, this definition generalises from how shadow banking may function in specific markets or jurisdictions, which may differ in important aspects.

Lastly, although this research takes a broad EU and interdisciplinary approach aiming to bring pertinent legal and economic perspectives together, this research must equally have certain limitations else its completion would

50 M Hesselink, "The Structure of the New European Private Law" (2002) *6.4 Electronic Journal of Comparative Law*, available at: http://www.ejcl.org/64/art64-2.html.

otherwise become unattainable. Consequently, it does not cover every issue in relation to the legal and economic implications that may apply to mandatory margin requirements in the EU shadow banking sector. It leaves out, for example, applicable accounting standards and taxation treatment. It also does not cover the important aspects of behavioural economics – including information insensitivity, which may inform policy makers on the possible behaviour of market participants, also when having to predict how effective the rules proposed in this dissertation may be. These perspectives may be of great practical and societal relevance and while outside the scope of this study, could therefore be viewed as important topics for future study.

5 Structure of Thesis: A Roadmap

The structure of this thesis will provide an important roadmap and can be summarised as follows. Chapter 2 will discuss shadow banking. Since the Global Financial Crisis, the shadow banking sector has risen in stature to parallel the traditional banking sector and therefore now accounts for a significant part of the financial system. It is a sector that provides an alternative source of funding but without being subject to prudential regulation. In this regard, the shadow banking sector operates within the legal perimeter, yet outside the confines of prudential regulation. Given the vastness of the shadow banking sector and because it encompasses a varied set of entities, activities and transactions, there is currently ongoing debate regarding the "pejorative" nature of the shadow banking sector, which is arguably proving to be an obstacle to providing a clear and commonly agreed definition.[51] This chapter will therefore focus on what shadow banking is, how it should be defined and the role it played in the Global Financial Crisis. Importantly, it will also locate financial collateral and margin within the EU shadow banking framework.

Chapter 3 will analyse the use of financial collateral and its growing importance within the EU shadow banking sector. Financial collateral is often described as having 'money-like' equivalence given its importance in hedging default risk.[52] High-quality, liquid and safe assets are therefore the main currency used within the EU shadow banking sector, which commentators now often describe as the "collateral-based banking system".[53] The use of financial

51 J S Taub, "What We Don't Talk About When We Talk About Banking" in M H Wolfson and G A Epstein (eds), *The Handbook of the Political Economy of Financial Crises* (2013) 447 at 451.

52 M Singh, *Collateral and financial Plumbing* (2016) 35.

53 Bank of England, "Centre for Central Banking Studies" (2018) 1 at 14, available at: https://www.bankofengland.co.uk/-/media/boe/files/ccbs/ccbs-prospectus-2018.pdf?la=en&hash=CC52F29880CDDAE54988A3F24065123B0EB633F5. See also, P Mehrling, Z Pozsar, J Sweeney and D Neilson, "Bagehot was a Shadow Banker: Shadow Banking, Central banking, and

collateral has therefore become a widespread risk mitigation mechanism by financially underpinning various transactions, namely repos, securities lending and derivatives transactions. The smooth operation of these transactions is indeed facilitated by financial collateral, which is a crucial component enabling the economy to function efficiently. There are also issues of property law to consider when discussing financial collateral. For example, what entitlement any participating party has in relation to the financial collateral. This is especially important with regard to whether the financial collateral will be used for recovery or tradability reasons, which are particularly relevant in terms of insolvency, collateral velocity and its re-use/re-hypothecation.

Chapter 4 will deal with the issue of margin and its economic rationale. In order to explain 'what is margin?', the starting point is to understand that financial collateral serves as security and is intended to hedge default risk. Margin is in place to add a further layer of security by hedging the risk on that financial collateral. Therefore, margin is an important tool, in place to overcollateralise the transaction and essentially acts as a financial buffer against any potential price fluctuations. There is a distinction between margin provided *ex ante* and margin provided *ex post*. *Ex ante* margin requirements can either be in the form of a 'haircut' or 'initial margin' – both concepts result in the same outcome, the only difference being the arithmetic used in the calculation process. *Ex post* margin controls take account of the gains or losses on an open position by marking the financial collateral to market. The phrase 'mark-to-market' means that the posted financial collateral in a collateral transaction is valued based on the current market price and this value is then compared with the original/last valuation.[54] It should however be noted that while margin is principally a risk mitigation mechanism, it is equally a procyclical mechanism that can undermine financial stability.

Chapter 5 will explore the practical operation of collateral transactions within the EU shadow banking sector from the perspective of the pertinent master agreements, focusing particularly on financial collateral and margin. In the case of repos, the GMRA will be analysed. Because repos have essentially been transformed from a back-office activity in the 1970's to now become a central component of modern finance, it is important to understand how such transactions operate, especially in relation to risk mitigation measures, namely the application of margin. Securities lending transactions will also be explored from the perspective of the GMSLA. Repos and securities lending play a functionally similar role and this is also the case when discussing the role of margin. The collateralisation of a derivatives transaction from the perspective of the Credit Support Annex under the ISDA master agreement will also be

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the Future of Global Finance" (2012) *Institute for New Economic Thinking* 1 at 4 where the authors state that modern finance or the shadow banking system can also be termed the "collateral-based credit system"; Benjamin *et al* (n 36) 4 at 4-5.

54 Balmer (n 37) 49-50.

discussed. While the ISDA Credit Support Annex is crucial from a legal perspective, since the Global Financial Crisis there is now significant interplay between the ISDA Credit Support Annex and EMIR and the accompanying RTS.

Chapter 6 will discuss the role debt plays in the EU shadow banking sector. Traditionally only the traditional banking sector could create 'safe' debt in the financial system by way of demand deposits. However, with the progress of financial innovation, demand has now grown. As such, the shadow banking sector has successfully managed to replicate the functions of banking by creating a variant of demandable debt, not subject to prudential regulation and credibly backed by a direct claim on liquidity.[55] However, despite shadow banking produced debt being credibly underpinned, it is also 'runnable'. Shadow banking produced debt is runnable when market participants begin questioning the credibility of the asset class in question. A run is a systemic event and often deemed a precursor to crises. When asset prices fall, margin levels increase, which forces leveraged market participants to deleverage precisely at a time when asset prices are low and volatility is high. In this sense, shadow banking sector produced debt is 'runnable' and can therefore be destabilising.

Chapter 7 will explore the various regulatory mechanisms underpinning margin in the EU shadow banking sector. While margin is principally in place to hedge risk, it is paradoxically a procyclical mechanism that can undermine financial stability and exacerbate systemic risk. Importantly, margin is a mechanism that is largely untouched by regulation and is therefore left to the discretion of the contracting parties. However, despite there being no comprehensive EU wide measures covering margin in the EU shadow banking sector, margin is still nevertheless addressed, directly and indirectly, in certain parts of the legal and regulatory framework. The focus of this chapter will therefore be to map the legal and regulatory framework in relation to margin as it currently operates in the EU shadow banking sector.

Chapter 8 will be normative in nature by proposing four complementary measures in relation to how margin *should* operate within the context of collateral transactions in the EU shadow banking sector. Firstly, it is the author's view that all collateral transactions should be subject to mandatory central counterparty ("CCP") clearing. CCP clearing is beneficial because it provides a robust infrastructure that was put to the test during the Global Financial Crisis where "it succeeded perfectly".[56] The advantages of CCP clearing are the *de facto* implementation of mandatory margin requirements; the so-called 'default waterfall', which deals with mitigating risk through the various predefined lines of defence; and, the multilateral netting structure, which in contrast to close-out netting, prevents over-lending given that multilateral netting mutualises losses among all clearing members. However, the big

55 Benjamin *et al* (n 36) 4 at 4. See also, Perotti (n 5) 1 at 2; Spence (n 12) 1 at 1-2.
56 Balmer (n 37) 53-54.

problem yet to be addressed in the CCP clearing framework is that while there is the *de facto* implementation of mandatory margin requirements, the precise margin levels are still left to the discretion of the contracting parties. Therefore, this thesis argues to impose a harmonised regulatory supranational margin framework, consisting of minimum margin floors, countercyclical margin add-ons and a discretionary margin ceiling, all to be built into the CCP framework.

Chapter 9 concludes.