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UNIVERSITY OF OXFORD**

Governance of non-bank systemically important financial institutions

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Abstract

This thesis identifies the circumstances under which corporate governance regulation can help gain traction to minimise systemic risk. Systemic risk is the risk that local losses spread through the financial system and badly affect the financial system and the real economy. Excessive risk-taking by financial institutions can contribute to such systemic risk. Prudential regulation and supervision of financial institutions leave corporate decision-makers with room for discretion to increase or decrease systemic risk. The incentives of these decision-makers are not necessarily aligned with minimising systemic risk. The thesis shows that this problem exists across different business models. More specifically, it identifies perverse incentives in the case of systemically important banks, CCPs, mutual funds, and hedge funds. The need for corporate governance regulation therefore lies in the inherent incompleteness of prudential regulation and supervision. Corporate governance regulation can help fill this gap by regulating the environment within which choices are made within these types of institutions.

The analysis has three steps. First, it characterises the systemic importance of financial-sector activities carried on outside the context of ‘banks’. The governance literature so far has focused on the ‘systemic externalities’ created by banks. However, our analysis shows that other non-bank SIFIs generate similar systemic externalities with socially harmful consequences. These systemic externalities are not considered by SIFIs when taking business decisions. In a second step, the thesis shows that prudential regulation and supervision are incomplete and leave room for governance regulation to fill in the gaps. The final step shows that a corporate governance framework focused solely on the interests of shareholders will have negative consequences for systemic stability. Given such divergence between the decision-makers’ and society’s interests, corporate governance regulation can complement the traditional prudential framework.

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Contents

Abstract.....	i
Acknowledgements	ii
List of legal materials	iii
Introduction.....	1
1. Setting the scene	1
2. Methodology	5
3. Contributions to the literature.....	7
4. Overview of the thesis.....	8
Chapter I. The ‘general’ corporate governance regime.....	10
1. A definition of corporate governance.....	11
2. The features of the ‘general’ corporate governance regime.....	13
2.1. Shareholder accountability.....	13
2.2. Justification for accountability to shareholders	15
2.3. Governance mechanisms and accountability to shareholders.....	17
2.3.1. Bonding mechanisms	18
2.3.2. Monitoring.....	18
2.3.2.1. By the board of directors.....	19
2.3.2.2. By the shareholders	19
3. Shareholder accountability and externalities.....	20
Chapter II. A ‘special’ governance regime for SIFIs	24
1. A definition of systemic risk.....	26
2. The analytical framework.....	28
3. A ‘special’ corporate governance regime for banks.....	30
3.1. The systemic nature of the bank’s business model.....	31
3.1.1. The bank’s business model.....	31
3.1.2. The systemic nature of bank activities.....	32
3.1.3. The perverse incentives under the bank business model	33
3.2. Gaps in the prudential framework.....	34
3.3. The perverse incentives of the agents.....	35
3.4. Summary.....	38
4. Expanding the analysis to non-bank financial institutions.....	38
4.1. Increased importance of non-bank financial institutions.....	39
4.2. Systemic risk and non-bank financial institutions	40

Chapter III. The systemic nature of the business model of asset managers	44
1. The business model(s).....	48
2. Systemic externalities	50
2.1. Systemic features.....	50
2.1.1. Open-ended vs. closed-ended funds.....	50
2.1.2. Exit rights	50
2.1.3. Liquidity of underlying assets	53
2.1.4. Degree of leverage	55
2.1.5. Size.....	57
2.1.6. Managerial discretion.....	58
2.1.7. Compensation arrangements	59
2.1.8. Conclusion.....	60
2.2. Three examples	61
2.2.1. UK stock fund	62
2.2.1.1. Fund description.....	62
2.2.1.2. Systemic stability concerns	62
2.2.2. UK Corporate bond index fund	63
2.2.2.1. Fund description.....	63
2.2.2.2. Systemic stability concerns	64
Illiquid bond market	64
First-mover advantages.....	65
Systemic runs	66
2.2.3. Long-short equity alternative investment fund	67
2.2.3.1. Fund description.....	67
2.2.3.2. Systemic stability concerns	68
2.3. Systemic behaviour	70
3. Perverse incentives under the business model	72
Chapter IV. The systemic nature of the business model of CCPs.....	73
1. The business model.....	75
1.1. The business of CCPs	75
1.2. Mandatory use of CCPs as a systemic risk measure	78
1.3. Ownership structures of CCPs.....	79
2. Systemic externalities	80
3. Perverse incentives under the business model	81
3.1. Perverse incentives in the user-owned model.....	81
3.2. Perverse incentives in the non-user-owned model.....	84
3.3. Perverse incentives in the hybrid model	86
3.4. Summary of the perverse incentives under the business model	87

Chapter V. The current prudential framework and its limits	89
1. The analytical framework.....	91
1.1. Incomplete prudential norms.....	91
1.1.1. Public interest perspective.....	92
1.1.2. Public choice perspective.....	94
1.2. Prudential supervision as a gap-filler.....	95
1.3. The limits of prudential supervision.....	97
2. Incomplete norms: the case studies.....	98
2.1. Asset managers and their funds.....	99
2.1.1. Applicable regulation	99
2.1.2. The UCITS-Directive.....	102
2.1.2.1. Liquidity mismatch.....	103
2.1.2.2. Leverage	106
2.1.3. The AIFM-Directive	108
2.2. CCPs.....	109
3. Prudential supervision as gap-filler: the case studies	113
4. The limits of prudential supervision: the case studies.....	113
4.1. Supervisory competition regarding prudential requirements.....	114
4.1.1. The problem.....	114
4.1.2. ESMA's supervisory convergence powers.....	115
4.1.3. Governance as a complement.....	117
4.2. Level of residual discretion of the regulated actors.....	118
4.3. The locus of information.....	119
Chapter VI. The governance analysis: policy recommendations.....	123
1. The governance analysis: asset managers and their funds.....	124
1.1. The governance framework.....	124
1.1.1. The relationship between asset managers and the investors	125
1.1.2. The multi-layered governance problem.....	126
1.2. The perverse incentives case studies	128
1.2.1. UK corporate bond index fund.....	128
1.2.2. Long-short equity alternative investment fund	130
1.3. Policy recommendations	131
1.3.1. UK corporate bond index fund.....	131
1.3.2. Long-short equity fund.....	133
2. The governance analysis: CCPs.....	136
2.1. The governance framework.....	136
2.2. The perverse incentives	137
2.3. Policy recommendations	139
General conclusion	142

1.	The business model analysis.....	144
1.1.	The business model.....	145
1.2.	Systemic externalities	145
1.3.	Perverse incentives under the business model	149
2.	The incompleteness of the prudential framework.....	151
3.	The governance analysis: policy recommendations.....	152
3.1.	The corporate governance framework.....	152
3.2.	Perverse incentives of agents.....	154
3.2.1.	Banks	154
3.2.2.	Asset managers and their funds.....	155
3.2.3.	CCPs.....	156
3.3.	Policy recommendations	156

Introduction

Introduction.....	1
1. Setting the scene.....	1
2. Methodology.....	5
3. Contributions to the literature.....	7
4. Overview of the thesis.....	8

1. Setting the scene

The financial crisis showed that the activities of financial institutions can severely impact the stability of the financial system. Excessive risk-taking by financial institutions can result in losses that spread through the financial system and badly affect the financial system and the real economy. The risk of such spillover effects is referred to as ‘systemic risk’, i.e. the risk that local losses spread through the financial system, destabilize and disrupt its operations, and badly affect the real economy. Financial institutions that contribute to systemic risk are called systemically important financial institutions (‘SIFIs’).¹ While the systemic importance of large *banks* was well-known pre-crisis, the systemic importance of *non-bank* financial institutions – such as AIG or the Reserve Primary Fund – caught many by surprise.² This thesis is concerned with the use of corporate governance regulation to control systemic risk in systemically important *non-bank* financial institutions (‘non-bank SIFIs’).

Traditionally, regulation of systemic risk was based on the idea that systemic risk is prompted by a bank failure causing losses to the bank’s creditors and triggering runs by depositors on similar banks. Government-sponsored deposit insurance can prevent bank runs³, but also creates incentives for banks to take excessive risk, as losses are borne by the deposit insurer rather than the bank’s shareholders. As a result, regulation focused on preventing excessive risk-taking by banks, for example, through minimum bank capital requirements, regardless of the impact of such measures on the stability of the system as a whole.⁴ Prudential supervisors monitored the activities of individual banks and their regulatory compliance.

¹ The Financial Stability Board defines SIFIs as institutions, as financial institutions ‘whose disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity’, see Financial Stability Board, ‘Reducing the Moral Hazard Posed by Systemically Important Financial Institutions’ (2010) 1 <https://www.fsb.org/wp-content/uploads/r_101111a.pdf>.

² Joshua S Wan, ‘Systemically Important Asset Managers: Perspectives on Dodd-Frank’s Systemic Designation Mechanism’ (2016) 116 *Columbia Law Review* 805, 805; for an analysis of the reasons why the traditional risk models failed during the financial crisis, see Alan Greenspan, ‘Never Saw It Coming: Why the Financial Crisis Took Economists by Surprise’ (2013) 92 *Foreign Affairs* 88.

³ Douglas Diamond and Philip Dybvig, ‘Bank Runs, Deposit Insurance, and Liquidity’ (1983) 91 *The Journal of Political Economy* 401.

⁴ Frederic S Mishkin, ‘Prudential Supervision Why Is It Important and What Are the Issues?’ in Frederic S Mishkin (ed), *Prudential supervision: what works and what doesn’t* (University of Chicago Press 2001).

However, the crisis made clear that systemic risk also exists outside the banking sector and that the channels through which financial institutions can cause damage go beyond the failure of deposit-taking banks. Indeed, systemic risk originates from the interconnections between financial institutions and markets more broadly. For example, the run on short-term wholesale funding—where repurchase agreement and commercial paper creditors refused to roll over the loans—was a key trigger for the demise of Lehman Brothers, Bear Stearns, and Northern Rock, among others.⁵ Another example is the derivatives market and the interconnections it created, which turned out to be a catalyst for systemic contagion across market participants. More generally, the crisis showed that systemic problems do not necessarily arise from the collapse of large financial institutions, but also from the collapse of an entire asset market, such as the mortgage-backed securities market.⁶

As a result, regulators have significantly expanded the regulatory framework addressing systemic risk. For example, the Dodd-Frank Act – the US federal act which reformed financial regulation in the aftermath of the financial crisis, contains 2300 pages of detailed rules, tightly regulating the environment within which financial institutions operate. In its global regulatory outlook, the professional services firm Duff & Phelps estimates that the compliance costs among asset managers, brokers, banks and other financial institutions are up to 4% of revenue. By 2022, the costs could rise up to 10%.⁷

Regulators worldwide heavily rely on traditional prudential regulation and supervision to curb systemic risk.⁸ The traditional approach to prudential regulation controls systemic risk by directly regulating the activities of financial institutions. It constrains financial institutions' ability to take certain decisions (e.g. structural regulation prevents banks from engaging in proprietary trading) and encourages or even requires financial institutions to take certain precautionary measures (e.g. bank capital and liquidity requirements).⁹ The prudential regulator can work with hard and fast rules, which describe in detail the required or prohibited behaviour, or with open-ended norms, which leave discretion to the enforcer to fill in the exact content of the norms ex-post.

Prudential regulation is operationalised through prudential supervision, which is the set of tools (e.g. data collection, on-site inspections, sector-wide reviews) regulators use to monitor the activities of financial institutions. Prudential supervision aims to ensure that financial institutions comply with the prudential norms and adequately manage the risks associated with their activities. As financial markets are complex and rapidly evolving, it difficult for the lawmaker to determine – ex-ante – the exact content of the prudential norms

⁵ Hyun Song Shin, 'Reflections on Northern Rock: The Bank Run That Heralded the Global Financial Crisis' (2009) 23 *Journal of Economic Perspectives* 101.

⁶ Samuel G Hanson, Anil K Kashyap and Jeremy C Stein, 'A Macroprudential Approach to Financial Regulation' (2011) 25 *The Journal of Economic Perspectives* 3.

⁷ Duff & Phelps, 'Global Regulatory Outlook - Viewpoint 2017 - Opinions on Global Financial Services Regulation and Industry Developments for the Year Ahead' <<https://www.duffandphelps.com/-/media/assets/pdfs/publications/compliance-and-regulatory-consulting/2017-global-regulatory-outlook-viewpoint.ashx>>.

⁸ Eric J Pan, 'Understanding Financial Regulation' [2012] *Utah L. Rev.* 1897, 1907.

⁹ Lucian A Bebchuk and Holger Spamann, 'Regulating Bankers' Pay' (2009) 98 *Georgetown Law Journal* 247.

necessary to ensure financial stability.¹⁰ As a result, it is increasingly acknowledged¹¹ that supervision by the prudential regulator is a key tool to not only ensure compliance with the prudential norms, but also to fill in the gaps left by prudential norms adopted by the legislator.

Before the financial crisis, traditional prudential regulation and supervision of financial institutions – banks in particular – was deemed sufficient to control systemic risk generated by their activities. The goal of corporate governance – i.e. the system by which firms are directed and controlled¹² – as respects financial institutions was therefore not thought to be any different than as respects non-financial firms.

However, the financial crisis has focused attention on the problems with the corporate governance of financial institutions. More specifically, studies showed that *banks* that adhered to ‘good’ corporate governance practices, as defined pre-crisis, also encountered the most losses during the crisis.¹³ Thus far, the literature on the relationship between firm governance and systemic risk has focused on the peculiarities of the governance of banks compared to non-financial firms. ‘Shareholder value maximisation’—that is, the maximisation of financial returns to shareholders, typically as reflected in the share price—is the dominant goal of corporate governance in Anglo-American jurisdictions. As residual claimants, shareholders are thought to have appropriate incentives to guide discretionary decisions by managers—at least for solvent firms—since shareholders receive most of the upside and downside of the performance of the corporation. Prior to the financial crisis, the goal of governance as respects banks was not thought to be any different. Today, however, the emerging consensus is that the activities of (large) banks may generate systemic losses, which are not considered by shareholders. In particular, it is argued that shareholders can

¹⁰ Acknowledging the ever-evolving nature of financial services, the EU regulation in financial services is adopted via a specific procedure, namely the ‘Lamfalussy procedure’, named after the Lamfalussy Report, which recommended the adoption of the procedure for financial services. The ‘Lamfalussy procedure’ was introduced in 2001 in order to make the regulatory process in financial services quicker and more efficient. Originally only adopted in the securities sector, the procedure was soon extended to banking, insurance, occupational pensions and asset management. The traditional legislative process in the EU was criticised for being too slow and rigid to regulate the fast-moving financial market. The adoption of Directives – the preferred instrument for harmonisation by the end of the 1980s – could take multiple years. Moreover, the need to cover both high-level principles and technical rules resulted in a lack of clarity regarding certain provisions and an excess of detail regarding others. In addition, the legislation was unresponsive to the needs and concerns of the market, see Lamfalussy Committee, ‘Final Report of the Committee of Wise Men on the Regulation of European Securities Markets’; Rosa María Lastra, *International Financial and Monetary Law* (2nd edn, Oxford University Press 2015) 211 and 387.

¹¹ For example, ‘While it is clearly vital that the rules of doing business in a regulated industry are framed in such a way to ensure the appropriate regulatory outcomes, without effective supervision and enforcement, the rules will ultimately lack credibility. Indeed, it is only through the exercise of supervision that regulators are able to gather the information needed to make regulatory judgements, and appropriate powers of enforcement are also needed for them to be able to make firms act on these judgements. For this reason, the Government will ensure that each authority has its own credible and effective supervisory and enforcement powers.’, see HM Treasury, ‘A New Approach to Financial Regulation: Judgment, Focus and Stability’ (2010) 28.

¹² Adrian Cadbury, *Report of the Committee on the Financial Aspects of Corporate Governance* (Gee 1992).

¹³ Andrea Beltratti and René M Stulz, ‘The Credit Crisis around the Globe: Why Did Some Banks Perform Better?’ (2012) 105 *Journal of Financial Economics* 1.

externalise losses due to the high leverage in banks, which allows shareholders with limited liability to take a large bet on the bank's assets. The shareholders benefit from the entire upside of risky bets, but only lose their capital input in case of loss. In addition, government guarantees in the form of deposit insurance or a government bail-out disincentivise bank creditors from monitoring the bank. Therefore, the literature argues for a retreat from the shareholder maximisation model in banks.¹⁴ For example, some authors advocate tying executive compensation to a broader basket of securities than stock and stock options.¹⁵ The idea is that adding governance regulation to the traditional prudential framework can function as an additional safeguard against systemic risk. In other words, governance regulation can complement and strengthen the existing prudential strategy to directly regulate and supervise the activities of financial institutions by regulating a firm's governance.

Thus far, the debate on the relationship between firm governance and systemic risk has focused on the peculiarities of the governance of *banks* compared to *non-financial* firms. However, in recent decades, an increasing number of business projects find funding through the market instead of through traditional bank loans. As a result, the financial system today relies increasingly on non-bank financial institutions that facilitate funding through markets. In recognition of this, the US Financial Stability Oversight Council ('FSOC') has authority to designate non-bank financial institutions as 'systemically important' and subject them to higher prudential standards.¹⁶

As a result, the governance problems identified for banks may only be the tip of the iceberg. The activities of some non-bank financial institutions are likely to generate similar 'systemic externalities' that distort decision-making in non-bank financial institutions with a negative impact on financial stability. It follows that non-bank financial institutions may, like banks, also be cases where the 'general' approach to corporate governance—that is, shareholder value maximisation—is inappropriate. However, it is rather less clear what should be put in its place. The special treatment in the governance literature of systemically important banks is justified with reference to the peculiarities of the bank finance structure. Yet the potential for systemic externalities in non-bank firms may arise in different ways. Therefore, it is unclear whether the prescriptions of the bank governance literature may be extrapolated to non-bank SIFIs.

This thesis is concerned with the use of corporate governance regulation to control systemic risk in systemically important *non-bank* financial institutions.

¹⁴ John Armour and Jeffrey N Gordon, 'Systemic Harms and Shareholder Value' (2014) 6 *Journal of Legal Analysis* 35; Bebchuk and Spamann (n 9) 251–252; Jonathan R Macey and Maureen O'Hara, 'The Corporate Governance of Banks' (2003) 9 *Economic Policy Review* 91, 97–98; Joel Shapiro, Alan Morrison and Hamid Mehran, 'Corporate Governance and Banks: What Have We Learned from the Financial Crisis?' in Mathias Dewatripont and Xavier Freixas (eds), *The crisis aftermath: new regulatory paradigms* (Centre for Economic Policy Research 2012) 37.

¹⁵ Bebchuk and Spamann (n 9).

¹⁶ Recent policy changes, however, prioritize an activities-based or industry-wide approach over individual designation to addressing risks to U.S. financial stability, see U.S. Treas. Dep't, Memorandum to the President on FSOC's Designation Processes for Nonbank Financial Companies and Financial Market Utilities (2017), <https://www.treasury.gov/press-center/news/Pages/Treasury-Releases-Memorandum-to-the-President-on-FSOCs-Designation.aspx>.

Corporate governance regulation aims to control such risk-taking by imposing a set of mandatory rules prescribing the environment within which decision-makers make choices without limiting those choices.¹⁷ Governance regulation aims to – partly – fill in the gaps left by traditional prudential regulation and supervision by changing the goals of a financial institution’s governance without imposing certain means by which to achieve these goals.

2. Methodology

This thesis uses ‘case studies’ to examine the role of corporate governance regulation to gain traction to mitigate systemic risk generated by non-bank SIFIs. The case studies are used as tools to explore the need for further examination of the problem related to the governance of non-bank SIFIs.

The thesis examines two SIFIs, namely asset managers and their funds and central counterparties. First, asset managers, who manage portfolios of securities on behalf of investors, have become an essential part of the financial system. The asset management industry has grown significantly in the decade following the financial crisis and manages 40 per cent of the global financial system’s assets.¹⁸ The booming of bond funds in particular – at least in advanced economies – has increased the importance of asset managers in credit intermediation.¹⁹ The size of an asset manager can vary immensely from small companies with a few employees to financial conglomerates like Blackrock, Bank of America, Fidelity, and Goldman Sachs.²⁰ The growth has been concentrated in a few large players, which has raised questions about the impact on financial stability of the operations of those players.²¹

The second case study is a central counterparty (‘CCP’), i.e. a financial institution that interposes itself between the contract parties of a trade and becomes the buyer to every seller and the seller to every buyer. The successful performance of CCPs during the crisis has put them on the regulatory agenda as new financial bulwark against systemic contagion in the over-the-counter (‘OTC’) derivatives market.²² In the EU, for example, the European Market Infrastructure Regulation (‘EMIR’) introduced mandatory clearing via CCPs for

¹⁷ Bebchuk and Spamann (n 9) 280–282; Daniel K Tarullo, “‘Corporate Governance and Prudential Regulation’- Speech at Association of American Law Schools 2014 Midyear Meeting’.

¹⁸ FSB, ‘Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities’ (2017) 5.

¹⁹ IMF, ‘The Asset Management Industry and Financial Stability’, *Global Financial Stability Report: Navigating Monetary Policy Challenges and Managing Risks* (2015) 94.

²⁰ John Morley, ‘The Separation of Funds and Managers: A Theory of Investment Fund Structure and Regulation’ (2014) 123 *Yale Law Journal* 1228, 1238.

²¹ FSB (n 18) 7; Ian Katz and Jesse Hamilton, ‘BlackRock, Fidelity Face Initial Risk Study by Regulators’ (*Bloomberg*, 6 November 2013) <<https://www.bloomberg.com/news/articles/2013-11-05/blackrock-fidelity-face-initial-risk-study-by-u-s-regulators>> accessed 15 October 2019; PWC, ‘Nonbank SIFIs: Up next, Asset Managers’ [2013] PWC Regulatory Brief 7.

²² At the G20 summit in Pittsburgh in 2009 it was stated that ‘All standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest’, the EU has implemented this commitment through the European Market Infrastructure Regulation (‘EMIR’), in preamble (6) it is stipulated that ‘The Commission will monitor and endeavour to ensure that those commitments are implemented in a similar way by the Union’s international partners’, see G20, ‘G20 Leaders Statement: The Pittsburgh Summit’ (G20 2009).

certain standardised OTC derivatives. However, the centralisation of risks also makes CCPs central nodes in the financial market, whose failure could have devastating consequences for systemic stability. In recognition of this, the US FSOC has designated five central counterparties as systemically important.²³

Other types of non-bank SIFIs – such as insurance companies – remain outside the scope of the thesis. However, the thesis does develop a general framework through the case studies, which can be applied to other types of financial institutions in the future.

The thesis examines the case studies through a ‘functional’ approach. There is no widely accepted meaning of the term ‘functional’²⁴ and the term is used here to signal the focus of the thesis on addressing an economic problem.²⁵ More specifically, the analysis starts from the premise that the fragility of the financial system and the resulting systemic concerns are inherent to the nature of finance and exist across jurisdictions and economies throughout the world. The analysis therefore starts from a functional examination of the business model of financial institutions and how their business model could generate systemic risk, independent of the regulatory system in which they operate. This discussion is an economic matter and relates to the role of financial institutions in the financial system rather than the regulatory regime that governs their activities.

This approach has three important implications. First, the extended and complex nature of the problem of systemic risk entails that it is impossible to provide a complete overview of the issues involved. The thesis therefore explores the systemic issues through the use of case studies that provide examples of possible improvements of the regulatory regime. Second, the analysis of the systemic issues generated by the financial institutions can be used to evaluate regulatory regimes across jurisdictions. Although the focus of the discussion is on the rules applicable in the EU, the economic analysis provided in this thesis can be the basis for an evaluation of other jurisdictions’ prudential framework. Third, the discussion of the applicable regulation is inspired by the economic problems identified. As a result, the thesis does not aim to provide a comprehensive overview of the regulation applicable to the financial institutions discussed, rather it aims to engage in a discussion of how the nature of the economic problems informs the debate on the nature of the regulatory intervention.

²³ FSOC, ‘Appendix A - Designation of Systemically Important Financial Market Utilities’ [2012] Annual Report.

²⁴ ‘The term functional, [...] means different things to different people, and that some of the uses to which that term has been put in the past— particularly in the field of sociology— have made it justifiably suspect’, see John Armour and others, *The Anatomy of Corporate Law: A Comparative and Functional Approach* (Oxford University Press 2017) 3–4.

²⁵ This pragmatic approach of the use of the term ‘functional’ in the sense of focusing on the practical problems that exist in the market economy is based on the approach taken by the authors of the *Anatomy of Corporate Law*, ‘Our analysis is “functional” in the sense that we organize discussion around the ways in which corporate laws respond to [...] problems [...]’, see Armour and others (n 24) 4.

3. Contributions to the literature

The thesis develops a more complete account of the governance of systemically important financial institutions. It contributes to the literature in three ways. First, the thesis shows that the incentives problems identified for systemically important banks also exist in other classes of non-bank SIFIs. However, there exists heterogeneity in the nature of these problems and, as a result, in the nature of the solutions. In other words, the governance challenges vary not only between ‘SIFIs’ and ‘non-SIFIs’, but also amongst different types of SIFIs. For example, the thesis argues that in central counterparties the appropriate solutions will differ from those offered for banks to the extent that they use ‘creditors’ as a proxy for systemic stability. More specifically, in banking, some of the proposals focus on including the incentives of creditors in the corporate governance framework, since the creditors – as fixed claimants – have incentives to take less risk than bank shareholders.²⁶ Indeed, in banking, the problem rather lies in the reduced incentives of bank creditors compared to creditors of regular firms to monitor opportunistic behaviour of the bank. In central counterparties, in contrast, their main creditors – the clearing members – to a certain extent actively gain from encouraging the CCP to take on risk. As a result, re-orienting the governance framework to give more of a say to clearing members would be counterproductive from a systemic risk perspective.

Second, the thesis offers a general framework to analyse the role of governance regulation to gain traction to mitigate systemic risk in any type of financial institution. In other words, the thesis lays out the analytical foundations to analyse the role of governance regulation for other types of financial institutions. The framework offers the tools necessary to analyse future case studies in three ways. First, it identifies the overarching features that distinguish SIFIs from other firms. Second, the thesis lays bare the circumstances under which corporate governance regulation can gain traction to mitigate systemic risk. More specifically, the importance of governance regulation is a function of at least three variables: competition regarding prudential requirements, the level of residual discretion of the regulated actors, and the locus of information. Third, it introduces the distinction between the incentives at the level of the business model and the incentives at the level of the agent of the business. The agent-level analysis looks at the alignment or lack thereof between the business model and the agent’s incentives and its consequences for systemic risk. In doing so, the analysis can determine whether there is scope for regulating the systemic issues through governance interventions.

On the third level, the thesis generates meaningful recommendations for policy. More specifically, the results of the research inform the debate on the effectiveness of the corporate governance rules applicable to central counterparties and asset managers and their funds and provide concrete proposals for reform.

²⁶ See e.g. Bebchuk and Spamann (n 9); Steven L Schwarcz, ‘Rethinking Corporate Governance for a Bondholder Financed, Systemically Risky World’ (2017) 58 William & Mary Law Review 1345.

4. Overview of the thesis

The thesis consists of seven chapters. Chapter one introduces the general corporate governance framework applicable to firms in general. The chapter starts by introducing a working definition of corporate governance, which will be used throughout the thesis. Next, the chapter discusses the general corporate governance paradigm that underpins the corporate governance mechanisms used in businesses. The core idea is that corporate governance should focus on ensuring that executives act in the shareholders' interests instead of their own.²⁷ The final part explores the relationship between this general governance paradigm and the presence of externalities. Externalities are situations where person A's activities impose benefits or costs on person B. However, because a market is missing in A's activities no price is charged for the costs imposed by A nor does B pay a price for any benefit received from A.²⁸ It is argued that where negative externalities are present, pro-shareholder governance will encourage firms to explore opportunities to externalise the costs of their activities onto third parties. As a result, targeted government interventions in the governance framework of firms can be a powerful complement to other interventions aimed at internalising these externalities.

Chapter two shows that excessive risk-taking by financial institutions can result in systemic losses that spread through the financial system and badly affect the financial system and the real economy. In other words, financial institutions can generate systemic externalities that could potentially justify a modification of the general approach to corporate governance, i.e. a departure from the shareholder value maximization paradigm. Thus far, the literature on the relationship between firm governance and systemic risk has focused on the peculiarities of the governance of banks compared to non-financial firms. However, this chapter argues that changes in the financial market necessitate an expansion of the analysis beyond banks. The chapter first defines systemic risk. Then, the chapter introduces the analytical framework that will be used for assessing the need for the regulation of corporate governance constraints in financial institutions. Next, the chapter makes the case for a 'special' governance regime for systemically important banks, applying the analytical framework discussed. The final part of the chapter advocates that changes in the financial market require a re-evaluation of the governance framework applicable to systemically important non-bank financial institutions.

Chapter three introduces the first case study on asset managers and their funds and determines whether they generate systemic externalities, which distort the trade-offs made within the business model. The chapter first determines the 'business model' of asset managers and their funds, i.e. their strategy to generate revenue for the shareholders or 'principal'. Next, the chapter looks for features of the business model that could pose a threat to financial stability and generate systemic externalities. A variety of funds exist with differing features to accommodate the specific needs of their investors. The

²⁷ Jonathan R Macey, *Corporate Governance: Promises Kept, Promises Broken* (Princeton University Press 2008); Andrei Shleifer and Robert W Vishny, 'A Survey of Corporate Governance' (1997) 52 *The Journal of Finance* 737.

²⁸ Hal R Varian, *Intermediate Microeconomics: A Modern Approach* (8th ed, WW Norton & Co 2010) 644–645.

chapter considers seven different categories of these features of funds, exploring in each case their potential systemic relevance. Finally, the chapter argues that the pursuit of profit under the business model encourages the presence and severity of these systemic externalities.

Chapter four introduces the second case study on CCPs and determines whether CCPs generate systemic externalities, which distort the trade-offs made within the business model. The chapter first determines the 'business model' of CCPs, i.e. their strategy to generate revenue for its owners or shareholders. Next, the chapter looks for features of the CCP's business model that could pose a threat to financial stability. In other words, the chapter determines whether CCPs generate systemic externalities. Finally, the chapter argues that the pursuit of profit under the business model encourages the presence and severity of these systemic externalities.

Chapter five evaluates the current prudential framework applicable to the case studies discussed in the previous two chapters. In order to do so, it uses insights from both the public interest theory²⁹ and the public choice theory³⁰ of economic regulation. The analysis starts from the premise that it is difficult for the lawmaker to determine – ex-ante – the exact content of the norms necessary to ensure financial stability. In addition, lawmakers face incentive problems. As a result, prudential norms are inevitably incomplete. The chapter argues that certain types of prudential supervision can – to some extent – fill in the gaps left by prudential norms. However, prudential supervision has its limits as well. This is where governance can be a useful complement to the traditional prudential framework. The chapter first discusses the reasons why law is incomplete, the role of the prudential supervisor as gap-filler, and the limits of prudential supervision as a solution to incompleteness. The chapter then continues by applying each aspect of the analysis to the case studies and evaluates to what extent the prudential framework in place addresses the systemic issues identified in the previous chapters. This discussion lays bare the role for governance regulation in complementing the already existing prudential framework.

Chapter six then engages in a 'governance' or 'agent-level' analysis of the case studies and identifies how the way agents are constrained interacts with the systemic concerns. The analysis first identifies how the agent's actions are constrained in the case studies. In other words, the chapter establishes the functioning of the corporate governance framework within each case study. Next, the analysis determines the incentives of the agents with regard to both the business model and systemic risk considerations. Put another way, the chapter determines whether the constraints reduce agency costs between the agent and the business as well as the agent and systemic risk considerations. Finally, the chapter provides policy recommendations given the identified incentives.

The last chapter concludes and summarises the analytical framework to determine the use of corporate governance regulation to control systemic risk in non-bank SIFIs. In doing so, it lays out the necessary steps that need to be taken for future research to determine the scope for governance regulation in any type of financial institution.

²⁹ This theory assumes that regulation aims to maximise social welfare.

³⁰ This theory sees regulators as self-interested and assumed to pursue their own private objectives.

Chapter I. The ‘general’ corporate governance regime

Chapter I. The ‘general’ corporate governance regime	10
1. A definition of corporate governance	11
2. The features of the ‘general’ corporate governance regime	13
2.1. Shareholder accountability.....	13
2.2. Justification for accountability to shareholders.....	15
2.3. Governance mechanisms and accountability to shareholders	17
2.3.1. Bonding mechanisms.....	18
2.3.2. Monitoring.....	18
2.3.2.1. By the board of directors	19
2.3.2.2. By the shareholders.....	19
3. Shareholder accountability and externalities	20

This chapter introduces the general corporate governance framework applicable to firms. It proceeds in three sections. Section I.1 introduces a working definition of ‘corporate governance’, which will be used throughout the thesis. More specifically, it defines corporate governance as any (contractual or regulatory) constraint that is put in place to ensure that a business’ manager (as ‘agent’ of the business) considers the interests of the business and its constituencies when making decisions. In doing so, section I.1 determines the subject of the analysis of the thesis, namely the business a corporate agent has capacity to control. This helps to set the scene for the subsequent analysis in chapters III-VI, which investigate whether regulatory interventions in private corporate governance constraints can reduce the systemic impact of a business.

Section I.2 discusses the general paradigm that underpins the corporate governance mechanisms used in businesses. Although modern businesses involve a variety of constituencies, the predominant view in Anglo-American corporate governance scholarship is that a firm should be run in the interests of one specific constituency, namely its shareholders. It discusses the justifications for this paradigm as well as the governance mechanisms used to ensure that a firm’s management promotes the interests of shareholders.

Section I.3 discusses the relationship between this general governance paradigm and the presence of externalities. An externality is a cost (or benefit) incurred (or received) by a third party, but outside of that third party’s control. It is argued that where negative externalities are present, governance mechanisms focused on shareholder value maximisation will encourage firms to externalise the costs of their activities onto third parties. It is then argued that interventions in the *governance* regime of these firms could be a useful part of a toolkit of government interventions aimed at internalising these externalities.

1. A definition of corporate governance

This section introduces a working definition of corporate governance, which will be used throughout the thesis. Corporate governance refers to the system¹ by which firms are directed and controlled.² The thesis takes an agency perspective on corporate governance.³ More specifically, it starts from the premise that firms delegate the management of their business to a manager ('the agent'), who is in charge of the decision-making in the interest of the firm and its constituencies ('the principal').^{4 5} The term 'constituency' refers to any person who provides input to the firm for a certain benefit.⁶ Modern businesses involve a variety of constituencies, such as shareholders who provide equity financing in exchange for shareholders rights, consumers who pay a price in exchange for the consumption of a good, or employees who provide human capital to the firm for a salary.

The subject of our analysis comprises the 'action radius' of the agent, i.e. the scope of the business the agent has capacity or authority to control. The interests of agents are not necessarily aligned with the interests of the business they control. The relationship between the business' constituencies and the business' managers suffers from what economists call 'agency problems'.⁷ The agent has more information than the principal about its own actions and the principal cannot acquire that information at zero cost⁸. As

¹ There is no canonical definition of corporate governance in the literature or policy documents, however, most definitions focus on the internal processes related to the power balance between shareholders, board and managers, such as board independence, board composition and shareholder empowerment, see Mariana Pargendler, 'The Corporate Governance Obsession' (2016) 42 *The Journal of Corporation Law* 359, 361–362.

² Adrian Cadbury, *Report of the Committee on the Financial Aspects of Corporate Governance* (Gee 1992).

³ The agency perspective on corporate governance is widely used, see Jonathan R Macey, *Corporate Governance: Promises Kept, Promises Broken* (Princeton University Press 2008); Andrei Shleifer and Robert W Vishny, 'A Survey of Corporate Governance' (1997) 52 *The Journal of Finance* 737.

⁴ Michael C Jensen and William H Meckling, 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure' (1976) 3 *Journal of Financial Economics* 305.

⁵ For an overview the interaction between agency problems and corporate law see John Armour, Henry Hansmann and Reinier Kraakman, 'Agency Problems and Legal Strategies' in John Armour and others (eds), *The anatomy of corporate law: a comparative and functional approach* (Oxford University Press 2017) 29–47.

⁶ Some literature uses the term 'patrons' of the firm instead of 'principals', however, as both terms are used more or less synonymously in the literature, we will proceed using the term 'principal'. For an example of the use of the term 'patrons' see Henry Hansmann, *The Ownership of Enterprise* (The Belknap Press of Harvard University Press 1996).

⁷ The analysis of the firm through the lens of agency problems is an essential part of the contractual view of the firm – where the firm is seen as a nexus of contracts between different parties – developed by RH Coase, 'The Nature of the Firm' (1937) 4 *Economica* 386; Jensen and Meckling (n 4); Eugene F Fama and Michael C Jensen, 'Separation of Ownership and Control' (1983) 26 *The Journal of Law & Economics* 301; Eugene F Fama and Michael C Jensen, 'Agency Problems and Residual Claims' (1983) 26 *The Journal of Law & Economics* 327.

⁸ In this thesis the starting point to think about 'costs' is the ideal world, i.e. a perfect, cost-free world, that is unreal. Economists refer to this as the 'first best' allocation, i.e. the allocation of resources that optimizes social welfare in an ideal world. This perspective is in contrast to using alternative *real world* institutions as starting point of the analysis of costs. Economists refer to this perspective as constrained efficient. In economics a state of affairs is seen as "constrained efficient" if, in the real world, it is impossible to reduce costs any lower. Applied to agency costs, this means that 'agency costs' could be positive under the 'first best' allocation (i.e. compared to a hypothetical agent who can be costlessly

a result, the agent could possibly get away with taking decisions that are not in the principal's best interest.⁹ Acknowledging such agency problems, a business will constrain (with more or less efficacy) the agent's actions to ensure they further the interests of the business and its constituencies.

In this thesis, 'corporate governance' refers to the constraints that are put in place in a business to ensure that corporate decisions will – within the boundaries of discretion left by the regulator for making those decisions – consider the principal's interests and not the private benefits of those in charge of making the decisions. As illustrated by the case studies discussed in further chapters, the specifics of such constraints will vary across different business models and boil down to institutional detail. Corporate governance refers to any mechanism in place to convince the firm's constituencies that corporate decision-makers will take their interests into account – independent of the source of such process. Indeed, corporate governance processes can be shaped by contractual as well as by regulatory mechanisms.¹⁰

As far as contractual mechanisms are concerned, a business has incentives to add corporate governance constraints (e.g. executive compensation) to the extent that the marginal cost of such constraint (e.g. increased pay decreases the net profits of the business) outweighs the benefit for the business' constituencies by reducing agency costs (e.g. the managers' improved effort increases the profits of the business with more than the marginal cost of the executive compensation scheme).

Turning to regulatory processes, there are three main reasons for intervention. First, the regulators might intervene to reduce the costs of contracting for the parties involved. The regulator does so through the adoption of default rules, i.e. rules that are applicable in the absence of specific contractual arrangements. The parties can rely on the standard provisions and only specify those corporate governance rules that are different.¹¹ In this context, corporate governance regulation functions as an 'enabling' body of regulation.¹²

Second, the regulator might intervene to mitigate inequalities of bargaining power between contracting parties. Such regulation aims to avoid 'weaker' contract parties being exploited. For example, in Germany large companies are obliged to have

observed by the principal), but still at their lowest possible level under 'constrained' efficiency (i.e. compared to any other real-world arrangement).

⁹ Jensen and Meckling (n 4).

¹⁰ To be clear, the description of corporate governance used in this thesis is different from the standard account of 'corporate governance', which tends to focus on internal processes related to the power balance between shareholders, board and managers (see Mariana Pargendler, 'The Corporate Governance Obsession' (2016) 42 *The Journal of Corporation Law* 359, 361–362). This is to be expected for three reasons. First, the goal of the measures proposed in this thesis are different from those of traditional corporate governance. More specifically, the proposed measures aim to reduce systemic risk rather than maximise firm value. Second, the mode of implementation is different. More specifically, the proposed measures should be part of the body of prudential regulation applicable to financial institutions, rather than company law or private ordering. Third, the governance mechanisms discussed in the thesis span organisational boundaries, which is necessary given the nature of systemic risk. However, the definition used in this thesis is focused on the agency problems at the heart of the financial institutions analysed, and this is what it has in common with ordinary corporate governance.

¹¹ John Armour and others, *The Anatomy of Corporate Law: A Comparative and Functional Approach* (Oxford University Press 2017) 18.

¹² Frank H Easterbrook and Daniel R Fischel, *The Economic Structure of Corporate Law* (Harvard University Press 1991) 2.

representatives of the employees on the board of directors to counteract the inequality of contractual bargaining power between the employer and its employees.^{13 14}

Third, regulatory intervention can be justified by the presence of externalities that distort the decision-making by agents.¹⁵ As discussed in more detail below, 'externalities' are situations where person A's activities impose benefits or costs on person B. However, because a market is missing in A's activities no price is charged for the costs imposed by A nor does B pay a price for any benefit received from A.¹⁶ Externalities are problematic because they can lead to inefficient decision-making. When negative externalities are present, the social costs of an actor's decisions exceed the private costs. However, an autonomous rational actor will only consider the private costs. As a result, a private actor will take decisions the benefits of which exceed the private costs, but not the social costs. In the context of the stability of the financial markets, externalities arise due to the fact that the risky behaviour of a financial institution might have a negative impact on other firms and society as a whole through spillovers without the financial institution causing the harm providing compensation to the actors affected.

2. The features of the 'general' corporate governance regime

2.1. Shareholder accountability

According to the predominant view in the Anglo-American¹⁷ corporate governance scholarship¹⁸, a firm should be run in the interests of one specific constituency, namely

¹³ Section 7 Codetermination Act of 4 May 1976 (*Mitbestimmungsgesetz*).

¹⁴ Ewan McGaughey, 'The Codetermination Bargains: The History of German Corporate and Labour Law' (2016) 23 Colum. J. Eur. L. 135.

¹⁵ Pigou is credited to be one of the first to formalise the concept of externalities, see Arthur Cecil Pigou, *The Economics of Welfare* (Macmillan and co 1920).

¹⁶ Hal R Varian, *Intermediate Microeconomics: A Modern Approach* (8th ed, WW Norton & Co 2010) 644–645.

¹⁷ The new UK Corporate Governance Code 2018 - which took effect from 1 January 2019 - includes a new provision asking the board to describe in its annual report how it considered the interests of other stakeholders under their duty under Section 172 of the 2006 Companies Act. Section 172 requires a director to 'act in the way he considers, in good faith, would be most likely to promote the success of the company for the benefit of its members as a whole, and in doing so have regard (amongst other matters) to [...] the interests of the company's employees [...] [and] the impact of the company's operations on the community and the environment'. The phrasing of the section implies that the interests of other stakeholders are only considered to the extent they promote the interests of the shareholders. As a result, this new provision cannot be seen as a departure from shareholder accountability as the general model of corporate governance. The UK Listing Rules require companies to comply with the Main Principles of the Code. The Code is based on the 'comply or explain' model, i.e. deviation of the corporate governance rules in the code should be explained to shareholders, see for the provisions of the new code Financial Reporting Council, 'The UK Corporate Governance Code' (2018).

¹⁸ In the comparative literature, the standard narrative is that corporate governance in continental Europe, Japan and China tends more towards the stakeholder-oriented model, while the corporate governance in the UK and US are focused on shareholder value, see M Gelter, 'The Dark Side of Shareholder Influence: Managerial Autonomy and Stakeholder Orientation in Comparative Corporate Governance' (2009) 50 Harvard International Law Journal 129, 131; Mathias M Siems, *Convergence in Shareholder Law* (Cambridge University Press 2008) 176–178.

its shareholders¹⁹, within the boundaries of the applicable law and prior agreements with other stakeholders.²⁰ In other words, the governance constraints should focus on the agency relationship between the firm's managers and the firm's shareholders.

The interests of the firm's managers and the firm's shareholders are not necessarily aligned. Executives – as compared with shareholders in a public company – are not as diversified and so have lower risk tolerance. As a result, they might avoid risky investments even though the investments have a positive net present value. When risky investments turn out negatively, the managers might lose their job, while – absent performance-based compensation – their salary will remain the same when the investments turn out positively.²¹ Moreover, managers might be motivated to build their empire by for example engaging in mergers and acquisitions that increase the size and prestige of the firm, but have a negative net present value. They might also engage in self-dealing, for example by excessive personal use of companies' perks such as private jets or by helping out befriended suppliers.²² Such opportunistic²³ behaviour is categorised as an example of 'agency costs', as the behaviour reduces the value of the executives' (or agent's) performance to the shareholders (or principal).

Under the predominant Anglo-American²⁴ view, 'corporate governance' mechanisms should minimise these agency costs and ensure that executives act in the

¹⁹ The focus of corporate governance is on the interests of shareholders as a class. However, in case of a controlling shareholder, there exists a conflict of interest between the controlling shareholder and the minority shareholder. Corporate law does – to some extent – mitigate the agency costs that arise in such a situation. However, such measures inevitably reduce the power of the controlling shareholder and, therefore, increase the agency costs in the manager-shareholder relationship, see Armour and others (n 11) 79–108.

²⁰ Easterbrook and Fischel (n 12) 38; Milton Friedman, 'The Social Responsibility of Business Is to Increase Its Profits' [1970] *The New York Times Magazine*; Macey (n 3).

²¹ Martin J Conyon, 'Executive Compensation: Governance and the Financial Crisis', *The Oxford Handbook of Capitalism* (Oxford University Press 2012) 373; Easterbrook and Fischel (n 12) 90.

²² Conyon (n 21) 373; Hansmann (n 6) 37–38.

²³ Opportunism is used to refer to '[...] self-interest seeking with guile. This includes but is scarcely limited to more blatant forms, such as lying, stealing, and cheating. Opportunism more often involves subtle forms of deceit', as used by Oliver E Williamson, *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting* (Free Press 1985) 47–49.

²⁴ Indeed, the Anglo-American corporate governance practice seems to adhere to the predominant shareholder-focused view and focuses on shareholder accountability. The UK Corporate Governance Code states that a board's role is 'to promote the long-term sustainable success of the company, generating value for shareholders and contributing to wider society'. However, the phrasing of the applicable section of the 2006 Companies Act (i.e. section 172) implies that the interests of other stakeholders are only considered to the extent they promote the interests of the shareholders. Another example is the 'NYSE: Corporate Governance Guide', which states that 'companies need corporate governance policies that place the interests of their shareholders first'. The London Stock Exchange corporate governance guide focuses on the relationship between companies and their investors as well. CalPERS and Vanguard – two institutional investors – also seem to put long-term value creation and protection of investors' interests forward as attributes of good governance. Shareholder primacy goes beyond the pure Anglo-American traditions. For example, the EU corporate governance measures for listed firms follow the shareholder primacy paradigm as well. This in contrast to the European Commission's Green Paper on the 'Corporate Governance in Financial Institutions and Remuneration Policies', stating that 'financial institutions' internal governance cannot be reduced to a simple problem of conflicts of interest between shareholders and the management.' Furthermore, the OECD principles mainly focus on shareholders rights and accountability, see CalPERS, 'Global Governance Principles 2015'; CalPERS 10; Padraig Cronin and Frances Murphy (eds), *LSE Corporate Governance for Main Market and AIM Companies* (White Page 2012) 3; European Commission, 'Green Paper. Corporate Governance in Financial Institutions and Remuneration Policies' (2010) COM(2010) 284 final; Financial Reporting Council, 'The UK Corporate

shareholders' interests instead of their own.²⁵ ²⁶ Generally speaking, shareholders will expect the firm to maximise its net profits.²⁷ In publicly traded firms, the share price is commonly thought to be the best estimate of the expected long-term profitability of a firm. However, the share price does not necessarily reflect the long-term fundamental value of a company. For example, it is argued that the share price also includes a short-term speculative component.²⁸ Managers can boost this short-term component of the share price at the expense of the long-term interests of shareholders.²⁹ Moreover, an increase or decrease in share price – to the extent prices accurately reflect fundamental value – does not necessarily reflect managers' performance. External factors, such as falling interest rates, can boost the share price independent of the quality of decision-making of the manager.³⁰ This thesis does not take a position with respect to these debates. For the present purposes, it is sufficient to acknowledge that corporate governance measures that use the share price as a proxy of firm and manager performance should make the necessary adjustments to account for these anomalies.

2.2. Justification for accountability to shareholders

Shareholders, however, are not the only participants in the firm with an interest in the affairs of the business. The interests of these other constituencies are not necessarily aligned either with the interests of those taking decisions and, as a result, these constituencies suffer from similar agency costs as shareholders. For example, creditors expect the repayment of their fixed claims at maturity of their loans and employees expect to receive a salary at the end of each month. Risky investment strategies that, for instance, benefit executives with stock-based pay could put a firm at risk of bankruptcy to the prejudice of the claims of creditors and employees.

The predominant view in the corporate governance literature, however, focuses on solving the agency problems between shareholders and managers. Only in exceptional cases³¹ are the interests of other stakeholders – in particular creditors – considered. The advocates of shareholder primacy put forward three main justifications. First, it is argued that the expectations of shareholders tend to differ from the expectations of these other participants in that they are often more difficult to describe and protect in a contract. The reason is that shareholders have a residual claim

Governance Code' (n 17); OECD, 'G20/OECD Principles of Corporate Governance'; NYSE, *Corporate Governance Guide* (White Page 2014).

²⁵ Macey (n 3); Shleifer and Vishny (n 3).

²⁶ However, even perfectly designed corporate governance will not completely eliminate the costs for the shareholders associated with the agent-principal relationship, compared to a world where the principal can costlessly observe a hypothetical agent. This is because agency costs also include – besides the reduced value of the agent's performance to the principal – the costs incurred to 'monitor' and 'bond' the agent's behaviour, see Jensen and Meckling (n 4).

²⁷ Macey (n 3) 3.

²⁸ Patrick Bolton, José Scheinkman and Wei Xiong, 'Executive Compensation and Short-Termist Behaviour in Speculative Markets' (2006) 73 *Review of Economic Studies* 577; Burton G Malkiel, 'The Efficient Market Hypothesis and Its Critics' (2003) 17 *The Journal of Economic Perspectives* 59.

²⁹ Bolton, Scheinkman and Xiong (n 28).

³⁰ Lucian A Bebchuk and Jesse M Fried, *Pay without Performance: The Unfulfilled Promise of Executive Compensation* (Harvard University Press 2004) 139.

³¹ Steven L Schwarcz, 'Rethinking Corporate Governance for a Bondholder Financed, Systemically Risky World' (2017) 58 *William & Mary Law Review* 1345, 1352.

on the entire income of the firm after deduction of all other liabilities. Such residual claim is difficult to describe and protect in a contract through specific obligations of the firm, as the desired behaviour of the manager to ensure maximisation of the residual claim will change from time to time. Moreover, shareholders – in theory – commit their funds for the entire life of the firm. Again, such an unfocused and life-long claim to the firm's assets is difficult to describe and protect in a contract. Other stakeholders – such as creditors³² – often take on a more specific commitment to the firm. This allows them to protect themselves through contract from the outset against risk-taking that might jeopardise their claims, for example through restrictive covenants, higher interest rates, or the creation of a security interest.³³ The risk of shareholder expropriation by the firm caused by a lack of specific contractual protection of their interests will increase the cost of equity funding. As a result, a general governance structure protecting shareholders' interests can help to prevent such an increase in the cost of equity funding.³⁴

Second, as residual claimants, shareholders are also thought to have the best incentives – in solvent times – to guide discretionary decisions, as they will be most affected by the performance of the firm.³⁵ For instance, an increase in a solvent firm's total value, will only increase the security of the repayment of the fixed claim of the creditor, but will directly affect the size of the residual claim of the shareholders. In case of insolvency, on the contrary, shareholders have incentives to take excessive risks, as their residual claim is wiped out anyway. Creditors on the other hand are allowed to seize the assets of the firm in order to (partly) satisfy their claims and in effect become the 'owners' of the firm.³⁶ As a result, creditors become the residual claimants, as they are affected by good or bad decisions until their claims are satisfied.³⁷ In such a scenario³⁸, governance mechanisms aligning managers and creditors' interests come to the fore.^{39 40}

Third, it is argued that a more inclusive corporate governance framework will be a source of agency costs itself. Indeed, accountability to multiple principals increases decision-making costs for these principals to decide on the right course of action.⁴¹ This

³² For a well-developed account of why creditors do not get as much protection as shareholders, see Hideki Kanda, 'Debt-holders and Equity-holders' (1992) 21 *The Journal of Legal Studies* 431.

³³ Kanda (n 32) 440–442; Oliver Williamson, 'Corporate Governance' (1984) 93 *The Yale Law Journal* 1197, 1210–1211.

³⁴ Williamson (n 33) 1210–1211.

³⁵ Frank H Easterbrook and Daniel R Fischel, 'Voting in Corporate Law' (1983) 26 *The Journal of Law & Economics* 395, 403; Easterbrook and Fischel (n 12) 90–91; Macey (n 3) 12.

³⁶ Patrick Bolton, 'Corporate Finance, Incomplete Contracts, and Corporate Control' (2014) 30 *The Journal of Law, Economics, & Organization* i64; Jean Tirole, *The Theory of Corporate Finance* (Princeton University Press 2006) 389–95.

³⁷ See for example *West Mercia Safetywear Ltd v Dodd* (1987) 1988 BCLC 250 (Court of Appeal); *Geyer v Ingersoll Publ'ns Co* [1992] Court of Chancery of Delaware, New Castle County 621 A.2d 784; Easterbrook and Fischel (n 12) 69.

³⁸ The shift is not universally accepted, see for example Henry TC Hu and Jay Lawrence Westbrook, 'Abolition of the Corporate Duty to Creditors' (2007) 107 *Columbia Law Review* 1321.

³⁹ For an overview of the different strategies used, see John Armour, Gérard Hertig and Hideki Kanda, 'Transactions with Creditors', *The Anatomy of Corporate Law. A Comparative and Functional Approach* (3rd edn, Oxford University Press 2017) 127–140.

⁴⁰ See with regard to the allocation of voting rights Easterbrook and Fischel (n 12) 69.

⁴¹ James M Buchanan and Gordon Tullock, *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (University of Michigan Press 1962) 73.

will encourage the principals to delegate more decisions to their agents resulting in increased agency costs.⁴² In addition, when principals have diverging interests it will be more difficult to translate those interests in a consistent system of choices for the agents to adhere to.⁴³ Inconsistent decision-making by agents will be detrimental for the survival of the firm and, as a result, for all its constituencies.⁴⁴ Shareholders as a class, on the contrary, have relatively homogeneous interests⁴⁵ to increase the net present value of the firm's earnings, which gives managers a well-defined goal.⁴⁶ Advocates of shareholder primacy argue that without shareholder accountability, managers would be accountable to nobody, which would be detrimental to the other constituencies and social welfare more generally.

Since the financial crisis, this latter argument has come under increasing pressure. More specifically, it is argued that a sole focus on shareholder value maximisation encourages managers to actively undermine the effectiveness of regulation to the detriment of social welfare. Lobbying in order to obtain regulation more favourable to the business could be more profitable than complying with regulation.⁴⁷ In this context, empirical studies suggest that corporate political spending is positively related to firm performance⁴⁸. This relationship is especially strong for firms in regulated⁴⁹ or more concentrated⁵⁰ industries. In addition, managers focused on shareholder accountability will underinvest in compliance, as compliance is a long-term investment – which is hard for shareholders to monitor.⁵¹

2.3. Governance mechanisms and accountability to shareholders

Academic literature and policy work have identified a variety of corporate governance measures that are calculated to encourage those in control of the firm's decision-making to pursue shareholders' interests. This can be done, on the one hand, by aligning the

⁴² Easterbrook and Fischel (n 12) 66–67.

⁴³ Drawing on insights from Arrow and Black, Easterbrook states in this context that 'It is well known [...] that when voters hold dissimilar preferences it is not possible to aggregate their preferences into a consistent system of choices', see Kenneth J Arrow, *Social Choice and Individual Values* (Second, Yale University Press 1963); Duncan Black, *The Theory of Committees and Elections* (Cambridge University Press 1958); Easterbrook and Fischel (n 35) 405.

⁴⁴ Easterbrook and Fischel (n 12) 69–70.

⁴⁵ This is in particular true for diversified shareholders in publicly listed companies. However, the incentives of other types of shareholders – such as undiversified owners, executives, and other employees – could differ significantly.

⁴⁶ Hansmann (n 6) 62.

⁴⁷ Karthik Ramanna, *Political Standards: Corporate Interest, Ideology, and Leadership in the Shaping of Accounting Rules for the Market Economy* (The University of Chicago Press 2015).

⁴⁸ Hui Chen, David Parsley and Ya-Wen Yang, 'Corporate Lobbying and Firm Performance' (2015) 42 *Journal of Business Finance & Accounting* 444; Sean Lux, T Russell Crook and David J Woehr, 'Mixing Business With Politics: A Meta-Analysis of the Antecedents and Outcomes of Corporate Political Activity' (2010) 37 *Journal of Management* 223; Neil J Mitchell, Wendy L Hansen and Eric M Jepsen, 'The Determinants of Domestic and Foreign Corporate Political Activity' (1997) 59 *J of Pol* 1096.

⁴⁹ John C Coates IV, 'Corporate Politics, Governance, and Value Before and After Citizens United' (2012) 9 *Journal of Empirical Legal Studies* 657.

⁵⁰ Matthew Hill and others, 'Determinants and Effects of Corporate Lobbying' [2013] *Financial Management* 931.

⁵¹ John Armour, J Gordon and G Min, 'Taking Compliance Seriously' (2020) 37 *Yale Journal on Regulation* 1, 1.

incentives of those taking decisions with the shareholders' interests through 'bonding'⁵² mechanisms and, on the other hand, by intensive monitoring of managers' behaviour. Depending upon whether controlling shareholders are present or whether shareholders are more dispersed, different measures will be more or less efficient.⁵³ For example, shareholder monitoring will be less efficient in a dispersed ownership structure than in an ownership structure with a controlling shareholder.

2.3.1. Bonding mechanisms

One category of corporate governance mechanisms aims to align the incentives of executives with those of shareholders through the use of bonding mechanisms. In this context, executive compensation is widely acknowledged as an important tool to encourage executives to pursue the economic interests of shareholders.⁵⁴ Payment through bonuses, shares, and options can link the executives' compensation to the performance of the firm. Holding periods and claw backs can ensure that executives do not pursue short-term goals.⁵⁵ In practice, there are significant calibration issues related to performance-related pay. For example, the careful design of the trigger for awarding a bonus is essential to ensure that the bonus effectively links pay to performance. Awarding a bonus, for instance, for an increase in profit compared to the previous accounting year does not necessarily signal good managerial performance, as the firm might still perform sub-standard relative to the rest of the industry.⁵⁶ Equity-based compensation is no guarantee of a strong link between pay and performance either. Changes in share price are not necessarily related to executive performance and it is important to carefully design the compensation plans. With regard to option plans, for example, the effect can be mitigated by – amongst other techniques – adjusting the exercise price of the option so it rises or falls with industry-specific market movements.⁵⁷

2.3.2. Monitoring

In addition to aligning the incentives of executives with those of shareholders, a variety of corporate governance mechanisms organise the monitoring of managerial behaviour.

⁵² A term launched by Jensen and Meckling seminal paper, see Jensen and Meckling (n 4).

⁵³ John Armour and others, 'The Basic Governance Structure: The Interests of Shareholders as a Class' in John Armour and others (eds), *The anatomy of corporate law: a comparative and functional approach* (Oxford University Press 2017) 49–50.

⁵⁴ European Commission, 'Action Plan: European Company Law and Corporate Governance - a Modern Legal Framework for More Engaged Shareholders and Sustainable Companies' 9 <<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012DC0740&from=EN>> accessed 25 July 2018; Financial Reporting Council, 'The UK Corporate Governance Code' (n 17) 14.

⁵⁵ Financial Reporting Council, 'The UK Corporate Governance Code' (n 17) 14; OECD (n 24) 48.

⁵⁶ Bebchuk and Fried (n 30) 124–125.

⁵⁷ Bebchuk and Fried (n 30) 137–143.

2.3.2.1. By the board of directors

First, the board of directors and its committees are increasingly being made responsible for monitoring managerial behaviour on behalf of the shareholders in addition to managing the companies' business.⁵⁸ Shareholders – especially in the case of publicly traded companies with dispersed ownership – can face significant information and coordination costs to monitor managers themselves and, therefore, are given voting rights to elect directors to do so on their behalf, whether based on pre-nomination by the board or not. Directors are subject to legal duties of loyalty and care towards their corporation and shareholders.⁵⁹ In addition, corporate governance codes generally require boards to have a number of directors that fulfil specific independence requirements⁶⁰ in order to ensure that the directors will represent the shareholders instead of the managers. Independent directors are typically required to participate in the audit, nomination, and remuneration committees in order to encourage shareholder accountability in the committees' decisions.⁶¹ However, in practice, it is difficult to prevent independence requirements from being a box ticking exercise, as inability to monitor managers themselves is likely to correlate with inability to actively engage in the election process and ensure the true independence of the directors from managers' influence.⁶² Moreover, directors will generally need to rely on the managers to provide them with the information necessary to monitor these same managers.

2.3.2.2. By the shareholders

Secondly, a variety of corporate governance measures enhance the ability of shareholders to monitor managerial behaviour. Shareholders are given tools to exercise control over decision-makers themselves. Typical tools include the right to remove directors or vote on important decisions such as charter amendments, remuneration policy, or major transactions.⁶³ Exercise of these tools is more likely to be effective in the case of concentrated ownership, due to coordination costs.⁶⁴

Recently, activist investors, such as hedge funds, have acquired stakes in companies in order to be able to use the shareholder rights to put pressure on the management to make changes to the companies' policies. Critics argue that activist investors often focus on implementing measures that create a short-term spike in the share price instead of long-term value creation.⁶⁵ The debate turns on to what extent

⁵⁸ OECD (n 24) 45.

⁵⁹ OECD (n 24) 27–46.

⁶⁰ European Commission, 'Green Paper: The EU Corporate Governance Framework' [2011] http://ec.europa.eu/internal_market/company/docs/modern/com2011-164_en.pdf. Accessed 25 July 2018; Financial Reporting Council, 'The UK Corporate Governance Code' (n 17) 6–7; OECD (n 24) 50.

⁶¹ Armour and others (n 11) 63–64.

⁶² Hopt and Leyens state that in publicly traded companies in Germany the management board often just picks the supervisory board, see Klaus J Hopt and Patrick C Leyens, 'Board Models in Europe – Recent Developments of Internal Corporate Governance Structures in Germany, the United Kingdom, France, and Italy' (2004) 1 *European Company and Financial Law Review* 135, 141.

⁶³ Financial Reporting Council, 'The UK Corporate Governance Code' (n 17) 8; OECD (n 24) 18–19.

⁶⁴ Armour and others (n 53) 49–50.

⁶⁵ See for example Francis Byrd, Drew Hambly and Mark Watson, 'Short-Term Shareholder Activists Degrade Creditworthiness of Rated Companies' [2007] *Moody's Special Comment* 1; contra see Lucian A

markets are informationally efficient and, therefore, reflect the alleged long-term costs of the activists' actions in the share price. In this context, the EU advocates for the transparency of voting policies by institutional investors.⁶⁶ The Stewardship Code in the UK advocates for similar transparency about voting and engagement with the firms.⁶⁷

3. Shareholder accountability and externalities

The last section discusses the relationship between the general governance regime and externalities generated by firms. The analysis first shows that in firms which generate externalities, shareholder accountability can lead to suboptimal results from a social welfare perspective. The section then reasons that this problem creates a role for government interventions in the activities of these firms. We then argue that interventions in the *governance* regime of these firms could be a useful part of a toolkit of government interventions aimed at internalising these externalities.

The pursuit of shareholders' interests can generate both benefits and costs for the firm's constituencies and society as a whole. On the one hand, the maximisation of shareholder profits is often beneficial for other constituencies.⁶⁸ More specifically, the interests of these other constituencies are often serviced as a by-product of profit-maximisation. For example, the long-term interests of the shareholders will inform managers to not expropriate creditors in order to prevent a future increase in the cost of credit. Moreover, the pursuit of profits can have a positive impact on third parties as well, outside any contractual or institutional relationship. It might, for instance, be profitable for a company to develop the infrastructure of the local community in which it is operating to the benefit of society as a whole. Section 172 of the UK Companies Act 2006 codifies this idea by requiring a director to '*act in the way he considers, in good faith, would be most likely to promote the success of the company for the benefit of its members as a whole, and in doing so have regard (amongst other matters) to [...] the interests of the company's employees [...] [and] the impact of the company's operations on the community and the environment*'. The phrasing of the section implies that the interests of other stakeholders are only considered to the extent they promote the interests of the shareholders. We find this idea in a variety of other corporate governance codes and recommendations.⁶⁹ On the other hand, the pursuit of profit maximisation can also generate costs for the other constituencies. A firm can for instance increase the riskiness of its activities to the detriment of the creditors. Another example is the pollution of the surrounding air by a firm which imposes costs on the neighbouring town.

Bebchuk, Alon Brav and Wei Jiang, 'The Long-Term Effects of Hedge Fund Activism' (2015) 115 Columbia Law Review 1085.

⁶⁶ European Commission, 'Action Plan: European Company Law and Corporate Governance - a Modern Legal Framework for More Engaged Shareholders and Sustainable Companies' (n 54) 8.

⁶⁷ Financial Reporting Council, 'The UK Stewardship Code 2020' <https://www.frc.org.uk/getattachment/5aae591d-d9d3-4cf4-814a-d14e156a1d87/Stewardship-Code_Final2.pdf> accessed 12 July 2019.

⁶⁸ Friedman (n 20); Easterbrook and Fischel (n 12) 38–39.

⁶⁹ CalPERS (n 24) 27 and 30; OECD (n 24) 34; Financial Reporting Council, 'The UK Corporate Governance Code' 1, 3–4.

As long as the involved parties are able to bargain with each other, the mere fact that shareholder value maximisation generates costs and benefits to the parties involved does not make the pursuit economically inefficient.⁷⁰ For instance, a large creditor will negotiate the necessary covenants and security interests as well adjust the price of its loans based upon the likelihood of expropriation of its claims in the firm's pursuit of profit maximisation.

Problems occur when the transactions costs are too high and private parties cannot bargain to obtain maximisation of social welfare.⁷¹ Take the pollution example and assume that the citizens have a right to clean air. In an ideal world without transaction costs, the firm will compensate the citizens until the marginal cost of reducing pollution equals the marginal benefit of clean air for the citizen. The overall welfare is maximised. In recognition of Coase' insight, this is often referred to as 'Coasean bargaining'. However, in reality no such bargaining takes place in relation to environmental degradation. Such situations are called 'externalities'⁷², i.e. situations where person A's actions and decisions impose benefits or costs on person B and B does not get compensated for the costs imposed by A nor does B pay for any benefit received from A because of the absence of a contractual or institutional relationship. In other words, the possibility of Coasean bargaining is the dividing line between contractual claimants and externalities.

When externalities are present, shareholder wealth maximisation can lead to suboptimal results from the standpoint of social welfare. A firm aiming to maximise shareholder profit will only consider private costs and benefits without considering the costs or benefits to third parties. For example, a firm might underinvest in R&D because it does not consider the social benefits from doing so.

Government interventions⁷³ can restore the balance by regulating the firm's activities and forcing firms to internalise social benefits and costs. Governments use a variety of measures to achieve this goal. The state can directly regulate the behaviour of companies and intervene in the companies' decision-making process, for example by setting pollution maxima. It can also mimic the social costs and benefits by imposing a so-called Pigouvian⁷⁴ tax⁷⁵ or granting a subsidy. Furthermore, the government can make the company liable towards the victims of certain behaviour.

As a result, as long as these government interventions function appropriately, shareholder value maximisation will lead to socially desirable results. This is because the duty to maximise profits is limited by the managers' obligation to act within the boundaries of applicable laws, including the laws which further the interests of the other constituencies who are affected by corporate behaviour, but are unable to contract in order to protect their interests. Conversely, absent adequate government interventions, ordinary corporate governance mechanisms encourage managers to generate negative externalities and discourage managers from generating positive

⁷⁰ RH Coase, 'The Problem of Social Cost' (1960) 3 Journal of Law and Economics 1.

⁷¹ Coase (n 70).

⁷² Pigou is credited to be one of the first to formalise the concept of externalities, see Pigou (n 15).

⁷³ Steven Shavell, *Foundations of Economic Analysis of Law* (The Belknap Press of Harvard University Press 2004) 1694–1696.

⁷⁴ Pigou (n 15).

⁷⁵ A Pigouvian tax is a tax levied for engaging in activities that generate negative side effects for society, which are not included in the market price. The tax aims to internalize these 'negative externalities' in the trade-offs made by the parties involved in these adverse activities.

externalities, as the managers should only consider the costs and benefits to the shareholders. Such an incentives scheme does not maximise social welfare.

Government interventions in the firm's activities aimed at internalisation of externalities are destined to be imperfect, if only for the reason that perfection would require the government to have complete information on the costs and benefits of the firm's action to both the firm and third parties. The resulting loopholes in regulation creates opportunities for firms to externalise costs onto third parties. Governance mechanisms focused on shareholder value maximisation will encourage managers to explore such opportunities. More specifically, the more effectively corporate governance mechanisms reduce agency costs between managers and shareholders, the more inclined managers will be to explore the loopholes in regulation or even to obtain political influence over the content of regulation in their pursuit of profit maximisation.⁷⁶

However, this observation does not necessarily tip the balance towards the general adoption of accountability of the managers to all the firm's constituencies or society as a whole. Indeed, such an inclusive system of corporate governance is not perfect either, if only because its lack of a focused goal makes it less effective as a guideline for managerial action and, therefore, it is likely to translate into the general pursuit of managers' interests.

Yet, the imperfection does signal a tension between externalities and the reduction of the shareholder-manager agency costs. In order to safeguard the maximisation of social welfare under the shareholder maximisation model, the costs of finding or creating loopholes in externalities regulation should be higher than the benefits for the managers of exploiting the loopholes. Adopting good regulation, on the one hand, can increase the costs of finding or creating loopholes. The benefits for managers, on the other hand, can be lowered by loosening the link between the firm's profitability and managers' interests or, in other words, by increasing agency costs in the manager-shareholder relationship. As discussed above, managers are naturally risk-averse and corporate governance aims to adjust these low risk incentives to the benefit of shareholders. Reducing agency costs is justified when the nature of externalities produced by the firm are easily identified and regulated and, therefore, the costs for managers to exploit loopholes is high compared to the potential benefits. Put differently, when the costs of finding loopholes in the regulatory framework are high and the probability of authorities identifying violations is high, the potential benefits for managers can be higher as well. More pressure on regulation to reduce agency costs is beneficial for society, as long as the regulatory framework is strong enough to prevent bursts. However, when the regulatory protection of externalities is shaky and the costs of finding or creating loopholes are, therefore, low, the benefits for managers of exploiting the loopholes should be constrained (i.e. agency costs should be increased and managers should not be rewarded for behaviour that benefits shareholders). In this context, chapter five argues that the traditional prudential framework addressing the systemic externalities generated by SIFIs is incomplete and the costs of finding and exploiting loopholes is therefore low. Chapter six then explores in more detail how regulatory interventions in corporate governance can complement the traditional

⁷⁶ Empirical studies suggest that corporate political spending is positively related to firm performance, see for example Chen, Parsley and Yang (n 48); Lux, Crook and Woehr (n 48); Mitchell, Hansen and Jepsen (n 48).

prudential framework. To be sure, increasing agency costs will increase the cost of equity financing to the firm. However, such intervention is necessary to maximise the total social welfare.

The above argument can be generalised to corporate governance models other than the predominant shareholder-value focused model, as corporate growth by generating externalities does not only benefit shareholders, but is also beneficial for example for creditors, employees, and customers. Therefore, any model of corporate governance that increases the benefits for managers when they pursue the interests of its contractual constituencies is problematic in that it increases the benefits for managers to generate externalities and puts more pressure on the regulatory framework concerning externalities. Making managers, for example, more responsive to the interests of customers might encourage managers to pollute the surrounding air and impose costs on the neighbouring town, as the gains from the reduction in costs to install filters can be used to make the goods produced more appealing to the customers.

The next chapter will show that excessive risk-taking by financial institutions can result in systemic losses that spread through the financial system and badly affect the financial system and the real economy. In other words, financial institutions can generate systemic externalities that could potentially justify a modification of the general approach to corporate governance, i.e. a departure from the shareholder value maximisation paradigm.

Chapter II. A ‘special’ governance regime for SIFIs

Chapter II. A ‘special’ governance regime for SIFIs	24
1. A definition of systemic risk	26
2. The analytical framework	28
3. A ‘special’ corporate governance regime for banks	30
3.1. The systemic nature of the bank’s business model	31
3.1.1. The bank’s business model	31
3.1.2. The systemic nature of bank activities	32
3.1.3. The perverse incentives under the bank business model	33
3.2. Gaps in the prudential framework	34
3.3. The perverse incentives of the agents	35
3.4. Summary	38
4. Expanding the analysis to non-bank financial institutions	38
4.1. Increased importance of non-bank financial institutions	39
4.2. Systemic risk and non-bank financial institutions	40

This chapter shows that excessive risk-taking by financial institutions can result in systemic losses that spread through the financial system and badly affect the financial system and the real economy. In other words, financial institutions can generate systemic externalities that could potentially justify a mitigation of the general approach to corporate governance, i.e. a mitigation of the shareholder value maximization paradigm. Thus far, the literature on the relationship between firm governance and systemic risk has focused on the peculiarities of the governance of banks compared to non-financial firms. However, this chapter argues that changes in the financial market necessitate an expansion of the analysis beyond banks. The chapter proceeds in four sections.

Section II.1 defines systemic risk. There is no uniform definition of systemic risk and different authors identify different local shocks or ‘triggers’, contagion channels, and consequences. The discussion lays bare the elusive and ever-evolving nature of the concept of systemic risk.

Section II.2 introduces a three-step analytical framework for assessing the need for the regulation of corporate governance constraints in financial institutions to help gain traction to mitigate systemic risk in the financial sector. The first step – the ‘principal-level’ or ‘business model’ assessment – determines whether the financial institution generates systemic externalities, which distort the trade-offs made within the business model. In other words, the first step determines whether the financial institution’s strategy to generate revenue for its shareholders has a negative impact on systemic risk. The second step identifies to what extent the current prudential

framework addresses the systemic issues identified in the first step. It determines whether the current prudential framework leaves gaps in the regulatory protection against excessive risk-taking by the financial institution. Finally, given the presence of systemic externalities and an incomplete prudential framework, the ‘agent-level’ or ‘governance’ assessment then identifies how corporate governance constraints interact with the systemic concerns identified at the principal-level. Put another way, the governance analysis determines the relationship between the governance constraints and systemic risk considerations.

Section II.3 then uses bank governance as a prototypical example to explain the analytical framework discussed. It first discusses how banks generate systemic externalities, which distort the trade-offs made within the business model. Then, it argues that the prudential framework is inevitably incomplete, as it is impossible – ex ante – to unambiguously specify for all future contingencies. Finally, it shows how corporate governance constraints interact with the systemic concerns and argues – in line with the current trend in the literature – that governance regulation can be a useful complement to the traditional prudential framework for banks.

Section II.4 argues that changes in the financial market require a re-evaluation of the governance framework applicable to systemically important non-bank financial institutions as well. Indeed, in recent decades, business projects increasingly find funding through the market instead of through traditional bank loans. As a result, the financial system today relies increasingly on non-bank financial institutions that facilitate funding through markets.¹ For instance, asset managers, who manage portfolios of securities on behalf of investors, have become an essential part of the financial system. BlackRock, the largest asset manager in the world, is a third larger than ICBC, the largest bank.² Moreover, the financial crisis made clear that systemic risk exists outside the banking sector and that the channels through which financial institutions can cause damage go beyond the failure of deposit-taking banks. Indeed, systemic risk arises from the interconnections between a wide range of (bank and non-bank) financial institutions and markets more broadly. As a result, non-bank financial institutions might generate similar systemic externalities, which distort the tradeoffs made within the business model.

¹ This trend has been the strongest in the US, but a similar trend is noticeable in the EU, see John Armour and others, *Principles of Financial Regulation* (Oxford University Press 2016) 433–434; Franklin R Edwards and Frederic S Mishkin, ‘The Decline of Traditional Banking: The Implications for Financial Stability and Regulatory Policy’ [1995] NBER Working Paper Series 1; Jakob de Haan, *European Financial Markets and Institutions* (Cambridge University Press 2009) 180–181; Nellie Liang, ‘Financial Stability: Lessons Learned from the Recent Crisis and Implications for the Federal Reserve’ in Douglas D Evanoff and others (eds), *The role of central banks in financial stability: how has it changed?*, vol 30 (World Scientific 2014) 71.

² Andrew G Haldane, ‘The age of asset management, London Business School’ (Speech at the London Business School, London 4 April 2014), <http://www.bankofengland.co.uk/publications/Documents/speeches/2014/speech723.pdf>

1. A definition of systemic risk

After the financial crisis, financial regulators worldwide adopted systemic risk mitigation as the main goal of the reform agenda.³ There is no established definition⁴ of systemic risk.⁵ The lack of uniform definition of systemic risk illustrates the elusive and ever-evolving nature of the concept.⁶ Broadly speaking, systemic risk is the risk that a local shock spreads through the financial system, destabilizes and disrupts its operations, and badly affects the real economy. Different authors identify different local shocks or ‘triggers’, contagion channels, and consequences.⁷ In addition, all aspects are intertwined.

First, a common factor is the presence of a local shock or trigger event. Billio, Getmansky, Lo, and Pelizzon broadly define systemic risk as ‘any set of circumstances that threatens the stability of or public confidence in the financial system’⁸. Other definitions are more specific with respect to the types of triggers. Some authors focus on the presence of an institutional failure. For example, a traditional view on systemic risk focuses on the systemic instability resulting from the failure of an individual bank, for example, due to a maturity mismatch on the balance sheet.⁹ Other triggers found in the

³ See for example ‘We took steps to fix the broken regulatory system and started to implement sweeping reforms to reduce the risk that financial excesses will again destabilize the global economy’, see G20, ‘G20 Leaders Statement: The Pittsburgh Summit’ (G20 2009); ‘The Group believes that the world’s monetary authorities and its regulatory and supervisory financial authorities can and must do much better in the future to reduce the chances of events like these happening again’ see The de Larosière Group, ‘The High-Level Group on Financial Supervision in the EU Report - 25 February 2009’; Congress United States, *Systemic Risk: Examining Regulators’ Ability to Respond to Threats to the Financial System : Hearing before the Committee on Financial Services, U.S. House of Representatives, One Hundred Tenth Congress, First Session, October 2, 2007* (Washington: US GPO 2008).

⁴ For a description of how systemic risk has been used in a variety of ways, see Iman Anabtawi and Steven L Schwarcz, ‘Regulating Systemic Risk: Towards an Analytical Framework’ (2011) 86 Notre Dame L. Rev. 1349, 1353.

⁵ As noted by Alan Greenspan, it ‘is generally agreed that systemic risk represents a propensity for some sort of significant financial system disruption. Nevertheless, after the fact, one observer might use the term “market failure” to describe what another would deem to have been a market outcome that was natural and healthy [...] Until we have a common theoretical paradigm for the causes of systemic stress, any consensus of how to measure systemic risk will be difficult to achieve.’, see Alan Greenspan, ‘Remarks at a Conference on Risk Measurement and Systemic Risk at the Board of Governors of the Federal Reserve System.’

⁶ As stipulated in a working paper by the Office of Financial Research: ‘Even if an exhaustive overview of the systemic risk literature were possible, it would likely be out of date as soon as it was written’, see Dimitrios Bisias and others, ‘A Survey of Systemic Risk Analytics’ [2012] OFR Working Paper 4 <http://papers.ssrn.com/sol3/Papers.cfm?abstract_id=1983602> accessed 27 October 2015.

⁷ For example, a survey by the Office of Financial Research identifies 10 definitions of systemic risk and discusses a (non-exhaustive) list of 31 quantitative methods of measuring it, Bisias and others (n 6).

⁸ Monica Billio and others, ‘Measuring Systemic Risk in the Finance and Insurance Sectors’ MIT Sloan School Working Paper 4774-10 <<https://www.bis.org/bcbs/events/sfrworkshopprogramme/billio.pdf>> accessed 7 October 2019.

⁹ A paper by Kaufman provides both a detailed review of the literature on why bank failures were traditionally considered more serious than other institutional failures and empirical evidence for and against this thesis, see George Kaufman, ‘Bank Contagion: A Review of the Theory and Evidence’ (1994) 8 Journal of Financial Services Research 123.

literature are common exposures to macroeconomic risks¹⁰, excessive balance sheet shrinkage¹¹, or broadly any economic shock – which could be an institutional failure, but also a market failure¹² (e.g. a fall in collateral values). The types of shocks considered as ‘systemic’ will depend on whether one takes a microprudential or macroprudential perspective on systemic risk. Prior to the crisis, systemic risk measures focused on preventing distress at individual institutions (i.e. microprudential measures), without considering the impact of such measures on the stability of the system as a whole. However, since the crisis, there is a move towards a broader approach to systemic risk, which aims to limit financial system-wide distress more generally (i.e. macroprudential measures).^{13 14}

A local shock then spreads through the financial system through a variety of contagion channels. Indeed, a distinguishing feature of systemic risk is that a local shock has an impact on a wider network.¹⁵ This can be because the distressed institution performs a critical function in the market. For example, as banks are an important source of capital, the failure of a large bank can significantly reduce the amount of capital available in the market and increase the cost of funding business projects.¹⁶

In addition, an institution does not have to provide a critical function in the financial sector for its problems to trigger systemic instability. It can still have systemic significance as long as its problems affect or (the market assumes it affects) critical institutions or markets.¹⁷ A similar contagion effect can result from the failure of a number of small institutions with a common exposure to critical institutions or

¹⁰ Claudio Borio, ‘Towards a Macroprudential Framework for Financial Supervision and Regulation?’ (2003) 49 CESifo Economic Studies 181.

¹¹ Samuel G Hanson, Anil K Kashyap and Jeremy C Stein, ‘A Macroprudential Approach to Financial Regulation’ (2011) 25 The Journal of Economic Perspectives 3.

¹² See for example Olivier de Bandt and Philipp Hartmann, ‘DP2634 Systemic Risk: A Survey’ [2000] European Central Bank Working Paper Series; Steven L Schwarcz, ‘Systemic Risk’ (2008) 97 Geo. LJ 193, 204.

¹³ Borio (n 10).

¹⁴ From a macroprudential perspective, regulators can take a cross-sectional or a time-series perspective on the manifestations of systemic risk. Time-series or ‘cyclical’ measures focus on the build-up of risk over time and address the amount of risk in the system at a point in time relative to the capital and liquidity resources. Cross-sectional or ‘structural’ measures focus on the structural features of a financial system that make it more vulnerable to shocks, given a certain amount of time-varying risk, see Armour and others (n 1) 410; Bank of England and Financial Services Authority, ‘Instruments of Macroprudential Policy: A Discussion Paper’ <<http://www.bankofengland.co.uk/publications/Documents/other/financialstability/discussionpaper111220.pdf>> accessed 15 May 2016.

¹⁵ de Bandt and Hartmann (n 12); George G Kaufman, ‘Bank Failures, Systemic Risk, and Bank Regulation’ (1996) 16 Cato J. 17; Schwarcz, ‘Systemic Risk’ (n 12).

¹⁶ Steven L Schwarcz, ‘Testimony before the U.S. House of Representatives Committee on Financial Services, October 2, 2007, Regarding “Systemic Risk: Examining Regulators” Ability to Respond to Threats to the Financial System’ 2.

¹⁷ In this context, Schwarcz argued that because hedge funds are not critical financial institutions themselves, ‘since they are not necessarily pivotal to the funding of companies. The likelihood that systemic risk would result from [...] the failure of [...] a [...] hedge fund therefore depends [...] on the likelihood that its failure would jeopardize the viability of capital markets’, see Schwarcz, ‘Systemic Risk’ (n 12) 202.

markets.¹⁸ Brunnermeier et al., for example, stipulate that systemic risk measures should tackle the risk posed 'by individually systemic institutions, which are so interconnected and large that they can cause negative risk spillover effects on others, as well as by institutions which are systemic as part of a herd.'¹⁹

Moreover, it is not necessary that an institution (or herd of institutions) should default in order to trigger a systemic collapse. For example, a price drop in an asset market – unrelated to the default of an institution – might induce a fall in collateral values and force financial institutions to deleverage, resulting in the contraction of their supply of credit to the rest of the market.²⁰ In other words, a local shock in an asset market can also spread through interlinkage between balance sheets and overreaction driven by imperfect information or common exposure to the same risk.²¹

Finally, systemic risk is characterized by its consequences for the economy. The literature identifies a wide variety of economic consequences, such as impact on the real economy²², 'disruptions in the provision of key financial services that can have serious consequences for the real economy'²³, 'increases in the cost of capital or decreases in its availability, often evidenced by substantial financial-market price volatility'²⁴, 'substantial volatility in asset prices, significant reductions in corporate liquidity, potential bankruptcies and efficiency losses'²⁵ or 'the functioning of a financial system to the point where economic growth and welfare suffer materially'²⁶. In essence, shocks in the financial system can become systemic because of the key functions the financial system performs for the real economy. The link with the real economy will differ depending on the types of systemic events involved. For example, as argued below, a collapse of the banking system could lead to efficiency losses in the credit allocation process – leaving good business projects unfunded – and interruptions in the payment system.

2. The analytical framework

Prior to the financial crisis, it was assumed that corporate governance had little to contribute to the debate about how to control the impact of systemically important institutions, i.e. financial institutions that could generate systemic losses that spread through the financial system and badly affect the financial system and the real economy.

¹⁸ Borio (n 10).

¹⁹ Markus Brunnermeier and others, *The Fundamental Principles of Financial Regulation: Geneva Reports on the World Economy 11* (International Center for Monetary and Banking Studies 2009).

²⁰ Bank of England and Financial Services Authority (n 14).

²¹ Borio (n 10).

²² Mr Gianni De Nicoló, Giovanni Favara and Lev Ratnovski, *Externalities and Macroprudential Policy* (International Monetary Fund 2012); Pawel Smaga, 'The Concept of Systemic Risk' [2014] Systemic Risk Centre Special Paper.

²³ FSB, IMF and BIS, 'Macroprudential Policy Tools and Frameworks' (2011) Progress Report to G20 2 <http://www.fsb.org/wp-content/uploads/r_1103.pdf?page_moved=1> accessed 15 May 2016.

²⁴ Schwarcz, 'Systemic Risk' (n 12) 204.

²⁵ Paul Kupiec and David Nickerson, 'Assessing Systemic Risk Exposure from Banks and GSEs Under Alternative Approaches to Capital Regulation' (2004) 28 *The Journal of Real Estate Finance and Economics* 123, 123.

²⁶ ECB, 'The Concept of Systemic Risk' [2009] ECB Financial Stability Review 134 <https://www.ecb.europa.eu/pub/pdf/fsr/art/ecb.fsrart200912_02.en.pdf>.

The governance of systemically important financial institutions was not thought to be any different from that of regular firms. The corporate governance literature did not consider the potential systemic externalities generated by a financial institution's decision-making when justifying shareholder accountability and – at least under the Anglo-American model – assumed that their governance should focus on the protection of the interests of the shareholders. Other mechanisms, such as capital regulation, were thought to deal with the systemic spillovers generated by financial institutions. Indeed, financial firms were routinely excluded from corporate governance studies on the basis that 'regulation' meant they would be expected to behave differently.²⁷ In other words, traditional prudential regulation and supervision were considered sufficient to prevent the pursuit of profits to lead to excessive risk-taking from a systemic risk perspective.

This part introduces an analytical framework for assessing the need for the regulation of corporate governance constraints in financial institutions to help gain traction to mitigate systemic risk in the financial sector. In this context, a distinction needs to be made between two types of regulatory interventions; the regulator can either (i) define the boundaries of the range of actions a *financial institution* – and by extension their agents – are permitted to take ('external' regulation) or (ii) define the boundaries of the constraints and control mechanisms on the actions of the decision-maker or *agent* ('internal' or 'corporate governance' regulation). In other words, external regulation operates on the principal-level and constrains the set of choices a financial institution as a business can make. A typical example is bank capital regulation describing the level of capital a bank should hold. This type of government intervention is also the traditional approach to prudential policy. Corporate governance regulation, on the other hand, operates on the agent-level and regulates the environment within which the financial institution's agents – and in particular decisionmakers or managers – make choices without limiting those choices. A typical example is regulatory interventions in the compensation schemes for a bank's directors and managers.

The analytical framework introduced consists of a three-step analysis. The first step – the 'principal-level' or 'business model' assessment – determines whether the financial institution generates systemic externalities, which distort the trade-offs made within the business model. The 'business model' assessment is concerned with the business under control of the managers, which is ultimately designed to maximise the returns for the shareholders. In other words, the first step determines whether the financial institution's business strategy to generate revenue for its shareholders has a negative impact on systemic risk. At this level, we assume zero agency costs between the business and their managers.

The second step identifies to what extent the existing prudential framework addresses the systemic issues identified in the first step by regulating the range of actions financial institutions are permitted to take. Put differently, the second step determines whether 'external' regulation of the financial institution's actions provides a solid protection against the institution's systemic impact.

²⁷ Klaus J Hopt, 'Better Governance of Financial Institutions' [2013] ECGI Working Paper Series in Law 1, 5; Luc Laeven, 'Corporate Governance: What's Special About Banks?' (2013) 5 Annual Review of Financial Economics 63, 64.

Finally, given the presence of systemic externalities and an incomplete ‘external’ prudential framework, the ‘agent-level’ or ‘governance’ assessment then identifies how corporate governance constraints interact with the systemic concerns identified at the principal-level. In other words, the ‘agent-level’ analysis adds the divergence between the agent- and principal-level incentives as an additional layer to the analysis. The agent-level analysis looks at the alignment or lack thereof between the systemic business model and the managers’ incentives and its consequences for systemic risk. Put differently, it determines whether the governance constraints on managers have a neutral, detrimental, or beneficial impact on the managers’ decision-making from a systemic risk perspective. It also identifies whether there is a comparative advantage for regulating the systemic issues at the agent-level in addition to at the principal-level.

To be clear, the thesis does not challenge the need for an external prudential framework to tackle systemic risk, but starts from the premise that such framework will necessarily be incomplete. Systemic risk is a particularly difficult area for the government to ‘get it right’, if only because financial innovation and complexity create a significant information asymmetry between financial institutions and the government.²⁸ As is argued in later chapters, governance regulation can – under certain circumstances – help fill in the gaps left by the current prudential framework.

The next section uses the current state of the art with respect to banks as an illustration of the application of the framework discussed above. In doing so, the section lays out the process necessary to determine the scope for corporate governance regulation in any type of financial institution. The rest of the thesis then applies the analysis to the case studies.

3. A ‘special’ corporate governance regime for banks

The financial crisis has focused attention on the problems with the corporate governance of systemically important *banks*.²⁹ Studies showed that banks that adhered to ‘good’ corporate governance practices, as defined pre-crisis, also encountered the most losses during the crisis.³⁰ Today, the emerging consensus is that the activities of (large) banks may generate systemic losses, which are not considered by shareholders when making discretionary decisions and distort decision-making from a financial stability point of view.³¹ Therefore, the literature argues for a retreat from the shareholder maximisation model in banks.³²

²⁸ On regulating complexity in the financial market, see Saule T Omarova, ‘License to Deal: Mandatory Approval of Complex Financial Products’ (2012) 90 Washington University Law Review 63.

²⁹ European Banking Authority, ‘EBA Guidelines on Internal Governance’ (2011); OECD, ‘Corporate Governance and the Financial Crisis: Key Findings and Main Messages’ (2009).

³⁰ Marco Becht, Patrick Bolton and Ailsa Röell, ‘Why Bank Governance Is Different’ (2011) 27 Oxford Review of Economic Policy 437; Andrea Beltratti and René M Stulz, ‘The Credit Crisis around the Globe: Why Did Some Banks Perform Better?’ (2012) 105 Journal of Financial Economics 1; David H Erkens, Mingyi Hung and Pedro Matos, ‘Corporate Governance in the 2007–2008 Financial Crisis: Evidence from Financial Institutions Worldwide’ (2012) 18 Journal of Corporate Finance 389.

³¹ John Armour and Jeffrey N Gordon, ‘Systemic Harms and Shareholder Value’ (2014) 6 Journal of Legal Analysis 35; Lucian A Bebchuk and Holger Spamann, ‘Regulating Bankers’ Pay’ (2009) 98 Georgetown Law Journal 247, 251–252; Jonathan R Macey and Maureen O’Hara, ‘The Corporate Governance of Banks’ (2003) 9 Economic Policy Review 91, 97–98; Joel Shapiro, Alan Morrison and Hamid Mehran, ‘Corporate

This section introduces the governance debate with respect to systemically important banks. More specifically, it applies the three-step analytical framework introduced above to banks. First, it discusses the systemic nature of the business model of banks. Second, it argues that the current ‘external’ prudential regulation and supervision – in place to address systemic issues in banks – is likely to have significant loopholes. Finally, it engages in the governance analysis and argues that governance regulation can help gain traction to address systemic issues in banks. In doing so, it will discuss the failure of bank governance prior to the financial crisis as well as the proposals put in place post-crisis to address the identified failures.

3.1. The systemic nature of the bank’s business model

First, the principal-level analysis investigates whether a financial institution generates systemic externalities, which distort the trade-offs made within the *business model*, i.e. the financial institution’s strategy to generate revenue for its shareholders. In order to identify whether a financial institution generates systemic externalities, the principal-level analysis proceeds in three steps. It starts by determining the business model of banks. Next, the analysis looks for features of the business model that could pose a threat to financial stability. Different business models are characterised by different packages of systemic features leading to different packages of systemic problems. Finally, the analysis determines whether the pursuit of profit under the business model encourages the presence and severity of these systemic features.

3.1.1. The bank’s business model

In banks, the business model consists of earning profits from the transformation of deposits into loans, i.e. through the spread between the interests on deposits (liabilities) and the interests on loans (assets). In other words, banks earn profits by performing a ‘transformation function’.³³ The literature identifies three transformation functions of banks.³⁴ First, banks engage in liquidity transformation. They provide depositors with liquidity by offering to pay back a ‘sum certain’ whenever depositors need cash. Banks then invest these deposits into assets – i.e. loans – which cannot be quickly converted into cash by the bank. The bank can perform such liquidity transformation because only a fraction of the depositors will actually use the option to withdraw their deposits.³⁵ Second, banks engage in maturity transformation. They transform short-term deposits into long-term loans. Third, they engage in credit transformation. Loans are risky

Governance and Banks: What Have We Learned from the Financial Crisis?’ in Mathias Dewatripont and Xavier Freixas (eds), *The crisis aftermath: new regulatory paradigms* (Centre for Economic Policy Research 2012) 37.

³² Armour and others (n 1) 371; Armour and Gordon (n 31); Macey and O’Hara (n 31); Shapiro, Morrison and Mehran (n 31).

³³ Armour and others (n 1) 277–279; Xavier Freixas and Jean-Charles Rochet, *Microeconomics of Banking* (2nd edn, MIT Press 2008).

³⁴ For a more detailed discussion of these three transformation functions, see Armour and others (n 1) 277–279.

³⁵ Douglas Diamond and Philip Dybvig, ‘Bank Runs, Deposit Insurance, and Liquidity’ (1983) 91 *The Journal of Political Economy* 401.

investments, which might not rhyme with the risk-appetite of risk-averse undiversified depositors. A bank is better placed to take on such risk, if only because the pooling of funds allows banks to better diversify the risks involved than individual investors.

3.1.2. The systemic nature of bank activities

It is generally accepted that the activities of (large) banks, can have a significant impact on financial stability and the functioning of the real economy. The transformation function performed by banks makes a bank's balance sheet structurally fragile. The transformation of short-term liquid deposits into long-term illiquid loans makes banks particularly vulnerable to liquidity problems.³⁶ Such transformation creates multiple equilibria. If confidence in the operations of the bank is maintained, banks provide efficient risk-sharing between depositors by insuring for liquidity shocks of depositors. If confidence is lost, investors will want to withdraw deposits before the bank runs out of assets. Early withdrawals are more likely to be fully repaid, creating a dominant strategy for investors to run on the bank. Such a dynamic could even result in the failure of financially healthy banks, as banks will be forced to sell off illiquid loans at fire sale prices in order to meet withdrawals.³⁷

These difficulties can constitute a local shock or 'trigger' event – as discussed under section 1 – and affect the entire financial system through a variety of 'contagion channels', i.e. interconnections within the financial system that allow for a local shock to spread and 'contaminate' a significant part of the financial system.³⁸ First of all, spillovers can happen through direct counterparty exposure, namely the 'counterparty channel'. Banks and other financial institutions are closely linked through trade activities amongst each other. For example, bank A takes out an unsecured loan from bank B and C. As a result, the failure of bank A could lead to difficulties at banks B and C because they most likely will not get repaid on the loan contracts. This might lead to cascading failures and take down a substantial part of the banking sector.

Furthermore, even without direct counterparty exposure, other financial institutions could be exposed to a failing institution through the 'asset liquidation channel'. Imagine bank A having similar investments as bank D and E. Banks A, D, and E have no direct contractual relationship. Bank A might encounter liquidity problems and be forced to quickly sell the correlated assets in fire-sales, depressing the market value of the assets. This will result in losses for banks D and E if their holdings of those assets are marked-to-market.³⁹ In addition, imperfect information might lead to overreaction by market participants who incorrectly fear that other institutions are directly or indirectly exposed to the failing bank.⁴⁰ The bigger the bank the more likely distress will spread through the financial system via the counterparty and asset liquidation channel.

³⁶ Armour and Gordon (n 31) 40.

³⁷ Diamond and Dybvig (n 35).

³⁸ The discussion is based on the more detailed account of systemic externalities generated by financial institutions in Brunnermeier and others (n 19) 3–5.

³⁹ For example, derivatives instruments are marked-to-market under both IAS 39 and its replacement IFRS 9. Generally speaking, IFRS 9 has reduced marked-to-market of assets compared to IAS 39.

⁴⁰ Armour and Gordon (n 31) 40–41.

Finally, as discussed under section 1, systemic risk is characterized by its consequences for the real economy. Bank failures – and distress in the financial system more generally – are systemic because of the costs the difficulties pose for the real economy. More specifically, bank failures impose a cost on society due to the critical role of banks in the real economy. Banks perform an essential function by reducing the cost of credit intermediation by developing expertise in identifying good borrowers, establishing long-term customer relationships and writing loan conditions.⁴¹ Moreover, banks provide critical payment services.⁴² Disruptions in the banking system, therefore, lead to efficiency losses in the credit allocation process – leaving good business projects unfunded – and interruptions in the payment system.

3.1.3. The perverse incentives under the bank business model

Given the systemic nature of the business model, the last step in the principal-level analysis determines the interaction between the business model and systemic risk. More specifically, this step determines whether the business benefits from the presence of these systemic features and, therefore, will actively pursue business strategies that increase systemic risk in the system. If the answer is positive, the trade-offs made by the business model will not consider the system-level costs resulting from systemic features, as these costs can be externalised to third parties.

In banks, the business does not bear a huge part of the potential systemic downside of risky business decisions. This is so because banks are highly levered relative to other firms, which allows banks to take a huge bet on the firm's balance sheet. Consider a bank with a leveraged loan portfolio of £10 financed by £1 of equity and £9 of debt in the form of deposits. Leverage allows the shareholders to increase their exposure to value changes in the loan portfolio from £1 to £10. When the portfolio generates gains, the bank benefits from the upside of the entire portfolio net the costs of the deposits. Leverage also increases the exposure of the bank to decreases in the value of the portfolio. Losses on the loan portfolio beyond the initial equity investment of £1 will result in the inability of the bank to pay back its depositors. However, this is of little concern to the bank's constituencies – and the shareholders and creditors in particular – due to the presence of externalities. Shareholders, on the one hand, are protected through limited liability. Shareholders do not bear the losses beyond the shareholders' capital investment of £1, making the bet on the firm's balance sheet asymmetric from the vantage point of the shareholders.⁴³ In such a context the argument that shareholders – as residual claimants – bear most of the upside and downside of discretionary decisions becomes less straightforward.

The bank creditors, on the other hand, are thought to have reduced incentives compared to creditors of regular firms to police risky behaviour by banks by increasing

⁴¹ Ben S Bernanke, 'Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression' (1983) 73 *The American Economic Review* 257, 263.

⁴² Independent Commission on Banking, 'Final Report' <http://webarchive.nationalarchives.gov.uk/20131003105424/https://hmt-sanctions.s3.amazonaws.com/icb%20final%20report/icb%2520final%2520report%5B1%5D.pdf>. Accessed 25 July 2018 2011, 35.

⁴³ Bebchuk and Spamann (n 31).

the price of credit, including restrictive covenants, or monitoring the behaviour of the bank.⁴⁴ This is largely because much of the bank's debt consists of deposits. Depositors are widely dispersed which leads to coordination and free-riding problems with regard to monitoring. More importantly, the systemic importance of the bank's activities has induced the government to provide deposit insurance in order to prevent bank runs. Such insurance further discourages depositors from monitoring the bank's behaviour as their claims are (partly) guaranteed by the state.⁴⁵ In addition, in previous times of crisis, governments have decided to bail-out systemically important banks in difficulties in order to prevent a bankruptcy, and this could happen again in the future. Such bail-outs shield even the long-term creditors (e.g. bondholders) – who cannot run on the bank – from the consequences of a bankruptcy.⁴⁶ These creditors might therefore also have reduced incentives to increase the price of credit, include restrictive covenants and/or monitor the bank, insofar as they expect a government bail-out of the bank. This is because in the case of a bail-out, they will not bear the full costs of default either.⁴⁷ This implicit government guarantee for systemically important banks gives banks incentives to become 'too big to fail', as this will reduce their costs of credit.⁴⁸ In other words, state guarantees, explicit or implicit, turn the creditors' problem into a problem for the government and its taxpayers. The contractual problem turns into a regulatory problem.

3.2. Gaps in the prudential framework

Prior to the crisis, 'external' prudential regulation and supervision were considered sufficient to prevent banks from taking excessive risk. There is a substantial body of prudential regulation that constrains banks in taking certain decisions (e.g. structural regulation prevents banks from engaging in proprietary trading) or encourages or even requires banks to take certain precautionary measures (e.g. bank capital and liquidity requirements).⁴⁹

However, 'external' regulation is inevitably incomplete, as it is impossible – ex ante – to unambiguously specify for all future contingencies.⁵⁰ In the context of systemic risk, this problem is especially pertinent, if only because the fast pace of innovation leaves regulators always one step behind market developments.⁵¹ Financial innovations can create systemic problems in a short period of time, which ex-ante rules are unable to anticipate. The issues surrounding the calculation of risk-based bank capital requirements or the premium paid for deposit guarantee systems are illustrative

⁴⁴ Armour and Gordon (n 31) 45; Bebchuk and Spamann (n 31) 251 and 257.

⁴⁵ Bebchuk and Spamann (n 31) 257; Macey and O'Hara (n 31) 98; Shapiro, Morrison and Mehran (n 31) 14.

⁴⁶ Armour and others (n 1) 342.

⁴⁷ Bebchuk and Spamann (n 31) 266–267.

⁴⁸ Armour and others (n 1) 374; Mark J Roe, 'Structural Corporate Degradation Due to Too-Big-to-Fail Finance' (2014) 162 University of Pennsylvania Law Review 1419.

⁴⁹ Bebchuk and Spamann (n 31).

⁵⁰ Katharina Pistor and Chenggang Xu, 'Incomplete Law' (2003) 35 New York University Journal of International Law and Politics 931.

⁵¹ Dan Awrey, 'Regulating Financial Innovation: A More Principles-Based Alternative?' (2011) 5:2 Brooklyn Journal of Corporate, Financial and Commercial Law 273.

examples in this context. Chapter five explores the sources of this incompleteness in more detail.

Supervision by the prudential authorities can – to some extent – fill in the gaps left by incomplete prudential norms. Traditionally, bank supervision focused on ensuring compliance with prudential regulation. In the mid-nineties the Federal Reserve started implementing a ‘risk-based’ approach to supervision. In risk-based supervision the focus lies on the discretionary assessment of the supervisor regarding the bank’s risk management and quality of its assets, rather than compliance with specific rules.⁵² Risk-based supervision is based on a conversation between supervisors and the firm and provides supervisors with the ability to adjust the behavior of banks – *ex post* – in the case it is deemed necessary for financial stability. In recent years there has been a trend to limit – to some extent – the discretion of the prudential authorities within the supervisory process of banks.⁵³

However, supervision – as a solution to the incompleteness of prudential norms – has significant flaws, if only because financial innovation and complexity create an information asymmetry between market participants and supervisors. Moreover, even in the presence of complete information, the limited public resources put significant constraints on the ability of prudential supervisors to understand the functioning of the market and timely identify risks.⁵⁴ Chapter five discusses these limits in more detail.

3.3. The perverse incentives of the agents

The last step in the analytical framework – the ‘agent-level’ or ‘governance’ analysis – identifies how the way agents are constrained in banks, interacts with the systemic concerns identified at the principal-level. Assuming a business model that has systemic implications, the interaction could be neutral, detrimental, or beneficial from a systemic risk point of view. The interaction is neutral if the bank’s business model constrains its agents in such a way that perfectly aligns the agent’s incentives with the (perverse) business model. The interaction is detrimental if a perverse business model is combined with a corporate governance system that creates even stronger perverse incentives for the agent. Finally, the interaction is beneficial if the financial institution constrains the agent in such a way that reduces the agent’s incentives to create systemic externalities more than would be desirable based on the principal-level incentives.

Prior to the financial crisis, the governance mechanisms used in banking did not differ significantly from those used in the general corporate governance framework. Bank governance relied on stock-based compensation, board oversight and independence, and strong shareholder rights in order to manage agency costs between managers and shareholders.⁵⁵ Stock-based compensation in particular was widely used

⁵² Pan, *supra* note 2.

⁵³ An example in this context is the introduction of CAMELS, i.e. a rating system used by prudential authorities to rate banks based on six factors, namely capital adequacy, asset quality, management, earnings, liquidity, and sensitivity.

⁵⁴ Armour and others (n 1) 82–84.

⁵⁵ For a detailed discussion of why bank governance is different and an overview of the post-crisis reforms, see Armour and others (n 1) 370–390.

to align the incentives of managers with the bank's business model by using the share price as proxy for bank performance.

The financial crisis has focused attention on the problems with the corporate governance of banks. There are at least two stances in the literature related to the failure of bank governance. On the one hand, it is argued that governance practices did not properly align the incentives of managers and shareholders. Boards did not have the necessary knowledge and independence to properly oversee the operations of the bank business in the interests of the shareholders. The complexity of a bank's business makes such oversight more difficult for bank boards than boards in non-financial firms. In non-financial firms, board oversight consists of ensuring that the firm's strategy is properly operationalised. However, in banks, such oversight demands an assessment of the risks involved in financial assets, which requires highly specialised knowledge. For example, in order to determine the value of an asset, the liquidity of the underlying market should be considered.⁵⁶ Moreover, if it is already proven difficult to correctly calibrate performance-based compensation in non-financial firms, the complexity of the bank's business model makes such calibration issues even more pertinent in banks. Performance depends on an assessment of the state of the financial assets (e.g. the creditworthiness of the borrower), which is difficult to translate into performance benchmarks. In this context, Bebchuk, Cohen, and Spamann argue that the pre-crisis bank executive compensation gave incentives to increase short-term profits in order to receive large amounts of performance compensation, even though this increased the probability of large losses for shareholders in the long term.⁵⁷ However, an empirical study by Fahlenbrach and Stultz⁵⁸ found no evidence that greater sensitivity of CEO pay to stock volatility was related to worse stock returns during the crisis.⁵⁹

Another stance in the literature holds that shareholders benefitted from the excessive risk-taking by managers and therefore the governance failure did not occur in the manager-shareholder relationship, but in the manager-society relationship. As discussed above, limited liability entails that shareholders enjoy unlimited upside, but capped downside. In other words, corporate governance constraints increased the manager's incentives to create systemic externalities in line with the principal-level incentives. It is argued that where 'general' corporate governance measures should (mainly) be calculated to prevent abuse in the shareholder-manager relationship, bank corporate governance additionally needs to consider the conflict of interests between shareholders and society as a whole. Schwarcz, for example, argues for including

⁵⁶ Armour and others (n 1) 378; Paul Davies and Klaus J Hopt, 'Non-Shareholder Voice in Bank Governance' in Danny Busch, Guido Ferrarini and Gerard van Solinge (eds), *Governance of financial institutions* (First Edition, Oxford University Press 2019).

⁵⁷ Lucian Bebchuk, Alma Cohen and Holger Spamann, 'The Wages of Failure: Executive Compensation at Bear Stearns and Lehman 2000-2008' (2010) 27 *Yale journal on regulation* 257.

⁵⁸ Rüdiger Fahlenbrach and René M Stulz, 'Bank CEO Incentives and the Credit Crisis' (2011) 99 *Journal of Financial Economics* 11.

⁵⁹ 'A plausible explanation for these findings is that CEOs focused on the interests of their shareholders in the buildup to the crisis and took actions that they believed the market would welcome. Ex post, these actions were costly to their banks and to themselves when the results turned out to be poor.', see Fahlenbrach and Stulz (n 58) 12.

bondholders' interests in the corporate governance of systemically important firms⁶⁰ through representation of bondholders on the board or through making managers accountable to both shareholders and bondholders. Although the incentives of bondholders are not perfectly aligned with the incentives of the public in general, Schwarcz argues that the pursuit of the interests of creditors will indirectly improve systemic stability by reducing the incentives to take risk.⁶¹ Others argue for altering the compensation structure of the bank's executives to better align their interests with those interests of the creditors and/or the public. For example, Bebchuk and Spamann advocate tying executive compensation to a broader basket of securities than stocks and stock options.⁶² Other authors advocate for an increased liability structure for bank officers and directors.⁶³ Omarova proposes an even more radical reconfiguration by giving the federal government – as holder of a 'golden share' – a seat on the board of each systemically important banking organisation with direct but conditional management rights. At all times, such directors should have certain 'dormant' rights, e.g. to approve risk policies. When there is a higher likelihood of increasing systemic risk, the special director gets more intrusive rights to, for example, veto or slow down certain activities.⁶⁴ These proposals aim to change the interaction between the governance framework and the systemic concerns identified at the principal-level. More specifically, the proposals want to make the interaction beneficial for systemic stability by reducing the agent's incentives to create systemic externalities more than would be desirable based on the principal-level – or shareholders' – incentives.

The post-crisis regulatory reforms seem to lack a clear vision. Some reforms aim to detach risk decisions in banks from shareholder value. For example, the EU Capital Requirements Directive IV ('CRD IV') states that remuneration of people working in control functions (risk management, compliance, and internal audit) cannot be linked to performance of the unit they oversee and, thus, becomes decoupled from shareholder incentives.⁶⁵ In the UK, the Financial Services Act increased the accountability of senior managers to the public by introducing an offence relating to decisions causing a financial institution to fail.⁶⁶ These reforms make the interaction between the governance framework and the systemic concerns beneficial for systemic stability by mitigating the perverse principal-level incentives at the agent-level.

Yet, other measures seem to actively encourage more shareholder involvement and point fingers at corporate governance mechanisms – such as performance-based compensation packages – that encourage decision-makers to increase short-term gains to the detriment of long-term shareholder value. The EU Shareholder Rights Directive,

⁶⁰ Where the literature discusses the problem from a broader perspective and includes other financial institutions, they abstain from engaging in a detailed analysis of the characteristics of these non-bank financial institutions.

⁶¹ Steven L Schwarcz, 'Rethinking Corporate Governance for a Bondholder Financed, Systemically Risky World' (2017) 58 William & Mary Law Review 1345.

⁶² Bebchuk and Spamann (n 31).

⁶³ Armour and Gordon (n 31); Claire A Hill and Richard W Painter, *Better Bankers, Better Banks: Promoting Good Business through Contractual Commitment* (The University of Chicago Press 2015).

⁶⁴ Saule T Omarova, 'Bank Governance and Systemic Stability: The 'Golden Share' Approach' (2017) 68 Alabama Law Review 1029.

⁶⁵ Art. 92 CRD IV.

⁶⁶ Section 36 Financial Services (Banking Reform) Act 2013.

for instance, aims to encourage long-term shareholder engagement and applies to listed companies – independent of their sector of activities. For example, it introduces a ‘say on pay’ for shareholders.⁶⁷ Another example of the focus on shareholder rights can be found in the provisions on the performance-based (‘variable’) pay in CRD IV. Where CRD IV in principle does limit the performance-based (‘variable’) packages of credit institutions and investment firms to 100 % of the fixed component of the total remuneration package for each individual, it allows shareholders to increase this ratio up to 200 %.⁶⁸ Given the analysis of the perverse shareholders incentives discussed above, it is highly unclear whether such measures are desirable from a systemic risk perspective. These reforms make the interaction between the governance framework and the systemic concerns at best neutral from a systemic stability perspective as they align the agent’s interests with the perverse incentives at the principal-level.

3.4. Summary

This section introduced the governance debate with respect to systemically important banks. More specifically, it used bank governance as a prototypical example to explain the three-step analytical framework introduced above for assessing the need for the regulation of corporate governance constraints in financial institutions to help gain traction to mitigate systemic risk. First, it discussed the systemic nature of the business model of banks and argued that the activities of (large) banks can have a significant impact on financial stability and the functioning of the real economy. Second, it reasoned that ‘external’ prudential regulation is necessarily incomplete and the role of the prudential supervisor as gap-filler has its limits as a solution to such incompleteness. Finally, it engaged in the governance analysis and identified how the way agents are constrained in banks interacts with the systemic concerns identified at the level of the business model. The section argued that while the governance reforms in the EU seek to be beneficial for systemic stability, they – at times – worsen the interaction between the governance framework and systemic risk concerns by aligning the manager’s interests with the perverse incentives at the level of the business model.

4. Expanding the analysis to non-bank financial institutions

In the last section, the chapter argues that the increased importance of non-bank financial institutions entails that the activities of some non-bank financial institutions are likely to generate similar ‘systemic externalities’ as banks at the business model or principal level. As a result, like in banks, such systemic externalities potentially distort decision-making in non-bank financial institutions with a negative impact on financial stability. In recognition of this, the US Financial Stability Oversight Council (‘FSOC’) has authority to designate non-bank financial institutions as ‘systemically important’ and subject them to higher prudential standards. The section first discusses the increased

⁶⁷ European Commission, ‘Press Release - Shareholders’ Rights Directive Q&A’ <http://europa.eu/rapid/press-release_MEMO-17-592_en.htm> accessed 26 May 2017.

⁶⁸ Art 94 CRD IV.

importance of non-bank financial institutions in credit intermediation, before discussing the relationship between systemic risk and non-bank financial institutions.

4.1. Increased importance of non-bank financial institutions

In the decades prior to the financial crisis, the role of deposit-taking banks in providing funding to households and businesses dramatically decreased.⁶⁹ Market-based mechanisms – i.e. mechanisms that rely on the issuance of securities – became an important source of debt funding to non-financial borrowers, (partly) replacing the need for traditional bank loans. For example, the FSB global shadow banking report 2018 indicates that the monitoring universe of non-bank financial intermediation (MUNFI) – a broad measure of non-bank financial intermediation⁷⁰ – represented 48.2 per cent of the total global financial assets, growing by 7.0 per cent in 2017 to an aggregate \$184.3 trillion.⁷¹ A narrow measure of non-bank financial intermediation⁷² – which only includes non-bank entities involved in credit intermediation activities posing bank-like financial stability risks⁷³ – represented 13.7 per cent of the total global financial assets in 2017.⁷⁴

The rise of market-based finance resulted from developments both on the liability side and the asset side. First, on the liability side, the creation⁷⁵ of money market mutual funds diminished the appeal of bank deposits. Money market funds provided a higher yield than bank deposits while also promising redemption at any time at par value. By providing bank-like services through the issuance of easily redeemable units, money market funds were able to attract short-term retail funds.⁷⁶ Moreover, in the decades prior to the financial crisis, there was an increased flow of retirement and personal savings into institutional investors, such as pension funds, life insurers and mutual funds. Their predictive cash flows and sheer scale entailed that they were less in need of banks for liquidity, maturity, and credit transformation than individual depositors.⁷⁷ As a result, they also provided the market with a significant cash pool to fund market-based mechanisms.

⁶⁹ Edwards and Mishkin (n 1); Sir John Gieve, 'Speech by Sir John Gieve, Deputy Governor of the Bank of England, at a Centre for the Study of Financial Innovation Roundtable: Financial System Risks in the UK – Issues and Challenges' (2006).

⁷⁰ The measure includes pension funds, insurance companies, financial auxiliaries, and other financial intermediaries (OFIs). OFIs includes all financial institutions that are not central banks, banks, insurance corporations, pension funds, public financial institutions or financial auxiliaries. Examples of OFIs are investment funds and broker-dealers, see FSB, 'Global Monitoring Report on Non-Bank Financial Intermediation 2018' (2019) 7.

⁷¹ FSB (n 70) 4.

⁷² FSB (n 70) 7.

⁷³ For example, collective investment vehicles susceptible to runs.

⁷⁴ FSB (n 70) 5.

⁷⁵ Money market funds were created in order to arbitrage interest restrictions imposed on banks, see Jonathan R Macey and Geoffrey P Miller, 'Nondeposit Deposits and the Future of Bank Regulation' (1992) 91 Michigan Law Review 237.

⁷⁶ Originally designed as a retail product, money market funds became a popular cash management tool for pension funds, insurance companies and corporations, see Armour and others (n 1) 483.

⁷⁷ Armour and others (n 1) 436–437.

On the asset side, banks also experienced increased competition in the credit provision through loans. First, the growth of the commercial paper market provided businesses with a market-based alternative to short-term credit needs. Money market funds provided for a ready market in such short-term credit, as the short-term nature of the credit matched the redemption terms of their units. Similarly, the growth of the junk bond market allowed companies with lower credit ratings to access the bond market. Most importantly, securitization⁷⁸ allowed non-bank financial institutions to issue loans, transform them into marketable securities, and use the proceeds to make new loans.⁷⁹ These activities were funded through short-term liabilities, such as commercial paper and repurchase agreements.⁸⁰ The buyers of securitized instruments used derivatives – and credit default swaps in particular – to ‘insure’ the credit risk inherent in the securitised loans.⁸¹

4.2. Systemic risk and non-bank financial institutions

Traditionally, it was assumed that systemic risk was caused by a bank failure causing losses to the bank’s creditors and triggering runs by depositors on other similar banks. Government-sponsored deposit insurance can prevent such bank runs,⁸² but also creates incentives for banks to take excessive risk, as losses are borne by the deposit insurer rather than the bank’s shareholders. As a result, regulators focused on preventing excessive risk-taking by banks, for example through minimum bank capital requirements, regardless of the impact of such measures on the stability of the system as a whole.⁸³ Generally speaking, it was believed that the rise of market-based mechanisms, outside of systemically important banks, reduced the level of systemic risk in the system.⁸⁴

⁷⁸ Securitisation is ‘a process whereby the cash flows generated by illiquid assets are pooled together, restructured [...], and sold as more liquid asset-backed securities (‘ABS’), see Armour and others (n 1) 460.

⁷⁹ Edwards and Mishkin (n 1).

⁸⁰ In a repurchase agreement ‘a financial institution, such as a commercial or investment bank that seeks to borrow funds sells a security and agrees to repurchase it from the buyer at a later date at a higher price, which reflects interest charged for the use of the cash’, see Roberta Romano, ‘Pitfalls of Systemic Risk Regulation in a World of Financial Innovation’ in Douglas W Arner and others (eds), *Systemic Risk in the Financial Sector: Ten Years After the Great Crash* (CIGI Press 2019).

⁸¹ Jakob de Haan, Dirk Schoenmaker and Sander Oosterloo, *Financial Markets and Institutions : A European Perspective* (2nd edn, Cambridge University Press 2012) 31.

⁸² Douglas Diamond & Philip Dybvig, Bank Runs, Deposit Insurance, and Liquidity, 91 J. Pol. Econ. 401 (1983).

⁸³ Frederic S Mishkin, ‘Prudential Supervision Why Is It Important and What Are the Issues?’ in Frederic S Mishkin (ed), *Prudential supervision : what works and what doesn’t* (University of Chicago Press 2001).

⁸⁴ As for example pointed out by the Sir John Gieve, then Deputy Governor of the Bank of England, a year before the financial crisis hit: ‘The changing nature of financial activity is illustrated by developments in credit derivatives markets. The availability of these instruments is enabling a change in the nature of banking itself towards business models based on origination and distribution rather than the retention of credit risk [...] And the issuance of asset-backed securities in the UK, which involve parcelling up and selling different claims on pools of assets such as consumer loans and mortgages [...] On the whole, such developments are positive for financial stability. Coupled with greater macroeconomic stability [...], they have made the financial system more robust by allowing market participants greater scope to distribute and diversify risk and to manage it effectively’, Sir John Gieve (n 69).

However, since the financial crisis⁸⁵, it is generally accepted that systemic risk not only arises through contagion from one distressed *bank* to another, but also from a variety of interconnections between a wide range of (bank and non-bank) financial institutions and markets more broadly. For example, the run on short-term wholesale funding – where repurchase agreement and commercial paper creditors refused to roll over the loans – was a key trigger for the demise of Lehman Brothers, Bear Stearns, and Northern Rock, among others.⁸⁶ Another example is the derivatives market and the interconnections it created, which turned out to be a catalyst for systemic contagion across market participants. More generally, the crisis showed that systemic problems do not necessarily arise from the collapse of large financial institutions, but also from the collapse of an entire asset market, such as the mortgage-backed securities market.⁸⁷

The fact that systemic risk exists outside the banking sector presents boundary issues regarding what types of institutions generate systemic externalities and therefore should be subject to increased scrutiny. Some non-bank market actors engage in bank-like activities because they transform short-term and liquid funds in long-term and illiquid investments and could therefore be seen as systemically important. For example, finance companies issue loans funded by short-term wholesale finance, such as commercial paper bought by money market funds. The failure of a large finance company could limit the credit provided to the real economy and have destabilizing effects on the market. However, the systemic importance of financial actors goes beyond the size of an institution and should include a variety of factors. Informative in this regard, is the designation power of Financial Stability Oversight Council ('FSOC') in the US. Under section 113 of the Dodd-Frank Act, the US Financial Stability Oversight Council has authority to designate *non-bank* financial companies⁸⁸ as 'systemically important' and subject them to higher prudential standards. Such firms are transferred to supervision by the Federal Reserve.⁸⁹ Section 113 identifies two events or *triggers*

⁸⁵ Even prior to the financial crisis, some voiced concern about the increased interdependencies between banks and markets, see for example Sir John Gieve (n 69); André Icard, 'Speech by André Icard, Deputy General Manager of the Bank for International Settlements, at the Fourth Joint Central Bank Research Conference on "Risk Measurement and Systemic Risk"' (2005); Yutaka Yamaguchi, 'Speech by Yutaka Yamaguchi, Deputy Governor of the Bank of Japan and Chairman of the Committee on the Global Financial System on "Triangular View of Systemic Risk and Central Bank Responsibility"' (2002).

⁸⁶ Hyun Song Shin, 'Reflections on Northern Rock: The Bank Run That Heralded the Global Financial Crisis' (2009) 23 *Journal of Economic Perspectives* 101.

⁸⁷ Hanson, Kashyap and Stein (n 11).

⁸⁸ A US nonbank financial company is 'a company (other than a bank holding company, a Farm Credit System institution chartered and subject to the provisions of the Farm Credit Act of 1971 (12 U.S.C. 2001 et seq.), or a national securities exchange (or parent thereof), clearing agency (or parent thereof, unless the parent is a bank holding company), security-based swap execution facility, or security-based swap data repository registered with the Commission, or a board of trade designated as a contract market (or parent thereof), or a derivatives clearing organization (or parent thereof, unless the parent is a bank holding company), swap execution facility or a swap data repository registered with the Commodity Futures Trading Commission), that is—

(i) incorporated or organized under the laws of the United States or any State; and

(ii) predominantly engaged in financial activities, as defined in paragraph (6)', see section 102 (a) (4) (B) Dodd-Frank Act.

⁸⁹ Section 804 of the Dodd-Frank Act provides FSOC with a similar authority to designate a financial market utility as systemically important.

related to non-bank financial companies that could result in a threat to US financial stability. More specifically, the FSOC could subject a company to a more stringent regime if material financial distress of the nonbank financial company ('first determination standard') or the nature, scope, size, scale, concentration, interconnectedness, or mix of activities of the nonbank financial company ('second determination standard') could pose a threat to the financial stability.⁹⁰

The evaluation of the two determination standards involves an assessment of how the distress or activities of the non-bank financial institution could affect other institutions or markets resulting in an impairment of financial intermediation or the functioning of the financial market more generally.⁹¹ FSOC identifies three main contagion channels. First, the exposure channel relates to contagion due to the impairment of the non-bank financial institution's creditors, counterparties, investors, or other market participants, who have exposure to the non-bank financial institution. Second, the asset liquidation channel involves a fire sale of the assets held by the non-bank financial institution which impacts other parts of the financial system. Third, the critical function channel relates to the inability of the non-bank financial institution to provide a critical function or service to the financial market; a service for which no alternative is available on the market.⁹² In deciding, FSOC must consider the following statutory considerations:

(A) the extent of the leverage of the company; (B) the extent and nature of the off-balance-sheet exposures of the company; (C) the extent and nature of the transactions and relationships of the company with other significant nonbank financial companies and significant bank holding companies; (D) the importance of the company as a source of credit for households, businesses, and State and local governments and as a source of liquidity for the United States financial system; (E) the importance of the company as a source of credit for low-income, minority, or underserved communities, and the impact that the failure of such company would have on the availability of credit in such communities; (F) the extent to which assets are managed rather than owned by the company, and the extent to which ownership of assets under management is diffuse; (G) the nature, scope, size, scale, concentration, interconnectedness, and mix of the activities of the company; (H) the degree to which the company is already regulated by 1 or more primary financial regulatory agencies; (I) the amount and nature of the financial assets of the company; (J) the amount and types of the liabilities of the company, including the degree of reliance on short-term funding; and (K) any other risk-related factors that the Council deems appropriate.⁹³

⁹⁰ FSOC, 'Authority to Require Supervision and Regulation of Certain Nonbank Financial Companies', 12 CFR Part 1310, (2012) 77 Federal Register 21640.

⁹¹ FSOC, 'Authority to Require Supervision and Regulation of Certain Nonbank Financial Companies', 12 CFR Part 1310, (2012) 77 Federal Register 21657.

⁹² FSOC, 'Authority to Require Supervision and Regulation of Certain Nonbank Financial Companies', 12 CFR Part 1310, (2012) 77 Federal Register 21657.

⁹³ Section 113 Dodd-Frank Act.

FSOC has boiled down the ten statutory considerations to six categories: size, interconnectedness, substitutability, leverage, liquidity risk and maturity mismatch, and the existing regulatory scrutiny. Each category addresses a different dimension of an institution's potential to generate systemic risk. The first three relate to the potential impact of the institution's financial distress on the broader economy. The last three relate to the vulnerability of the institution to financial distress.⁹⁴ As argued in the next two chapters, the systemic importance of non-bank financial institutions does not necessarily arise in the same way as in banks. Different categories will be more or less important in determining the systemic risk generated by non-bank financial institutions. Next, chapter three will discuss the systemic importance of asset managers and their funds. Chapter four will then discuss the systemic importance of CCPs.

⁹⁴ FSOC, 'Authority to Require Supervision and Regulation of Certain Nonbank Financial Companies', 12 CFR Part 1310, (2012) 77 Federal Register 21657.

Chapter III. The systemic nature of the business model of asset managers

Chapter III. The systemic nature of the business model of asset managers.....	44
1. The business model(s)	48
2. Systemic externalities.....	50
2.1. Systemic features.....	50
2.1.1. Open-ended vs. closed-ended funds.....	50
2.1.2. Exit rights	50
2.1.3. Liquidity of underlying assets	53
2.1.4. Degree of leverage.....	55
2.1.5. Size.....	57
2.1.6. Managerial discretion.....	58
2.1.7. Compensation arrangements.....	59
2.1.8. Conclusion.....	60
2.2. Three examples.....	61
2.2.1. UK stock fund.....	62
2.2.1.1. Fund description	62
2.2.1.2. Systemic stability concerns.....	62
2.2.2. UK Corporate bond index fund	63
2.2.2.1. Fund description	63
2.2.2.2. Systemic stability concerns.....	64
2.2.3. Long-short equity alternative investment fund.....	67
2.2.3.1. Fund description	67
2.2.3.2. Systemic stability concerns.....	68
2.3. Systemic behaviour.....	70
3. Perverse incentives under the business model.....	72

This chapter introduces the first case study on asset managers and their funds and determines whether they generate systemic externalities, which distort the trade-offs made within the business model. In other words, the chapter performs the first step – the ‘principal-level’ or ‘business model’ assessment – in the analysis to determine the need for the regulation of corporate governance constraints in the asset management industry.

Broadly speaking, asset managers provide investment services to clients to help manage the clients’ savings based on specific investment objectives. As part of this business, some asset managers establish collective investment funds and advertise those funds to investors to attract capital. The asset managers manage the investment portfolio of the fund on behalf of the investors, who receive shares or ‘units’ in the fund in return for their investment. Asset managers often manage multiple funds with a variety of characteristics at the same time and, as such, attach their brand to these funds.

We saw in chapter II that most of the literature on the relationship between firm governance and systemic risk has focused on the peculiarities of the governance of banks compared to non-financial firms. Yet the scale of the asset management sector has grown rapidly in the past few years. Where credit intermediation used to be controlled by banks, today asset managers increasingly play an important role (see Table 1, Table 2, Figure 1 for a comparison of the size of the “top 10” banks and asset managers by assets). The asset management industry has grown significantly in the decade following the financial crisis (see Figure 2) and manages 40 per cent of the global financial system’s assets.¹ The booming of bond funds in particular – at least in advanced economies – has increased the importance of asset managers in credit intermediation.² The size of an asset manager can vary immensely from small companies with a few employees to financial conglomerates like Blackrock, Fidelity, and Goldman Sachs.³ The growth has been concentrated in a few large players, which has raised questions about the impact on financial stability of the operations of those players.⁴

Although the impact of the financial crisis in the asset management industry was mainly focused on money market mutual funds⁵, the crisis did put the asset management industry as a whole under increased scrutiny.⁶ As discussed in more detail below, the pooling of capital in funds can create specific risks to financial stability.⁷ This chapter focuses on the systemic risk presented by asset managers and the funds they establish and manage.⁸

¹ FSB, ‘Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities’ (2017) 5.

² IMF, ‘The Asset Management Industry and Financial Stability’, *Global Financial Stability Report: Navigating Monetary Policy Challenges and Managing Risks* (2015) 94.

³ John Morley, ‘The Separation of Funds and Managers: A Theory of Investment Fund Structure and Regulation’ (2014) 123 Yale Law Journal 1228, 1238.

⁴ FSB (n 1) 7; Ian Katz and Jesse Hamilton, ‘BlackRock, Fidelity Face Initial Risk Study by Regulators’ (*Bloomberg*, 6 November 2013) <<https://www.bloomberg.com/news/articles/2013-11-05/blackrock-fidelity-face-initial-risk-study-by-u-s-regulators>> accessed 15 October 2019; PWC, ‘Nonbank SIFIs: Up next, Asset Managers’ [2013] PWC Regulatory Brief 7.

⁵ Money market funds played an important role in both the failure of Lehman Brothers and other institutions and the subsequent spill-over effects of their failure across the financial system. More specifically, money market funds provided short-term financing to financial institutions, including Lehman Brothers. This short-term funding was used to invest in a wide range of assets, such as mortgaged-backed securities. These securities functioned as collateral for the short-term funding provided by money market funds. When the housing bubble collapses, money market funds refused to roll-over the short-term loans, worried about the value of their collateral, contributing to the demise of Lehman Brothers. Moreover, the Reserve Primary Fund, which held significant amount of short-term debt issued by Lehman Brothers, suffered significant losses due to the failure of Lehman Brothers. As a result of such failure, the Reserve Primary Fund ‘broke the buck’, i.e. its net asset value fell below \$1. This led to a run on other money market funds. This forced money market funds to sell off assets and hoard cash to meet redemption requirements, leading to their refusal to further roll-over short-term debt needed by financial institutions, see for a detailed account Jennifer Taub, ‘Post-Lehman, Money Market Fund Protections Still Weak’ (*DealBook - The New York Times*, 1410964853) <<https://dealbook.nytimes.com/2014/09/17/post-lehman-money-market-fund-protections-still-weak/>> accessed 5 December 2019.

⁶ FSB (n 1) 7; Katz and Hamilton (n 4); PWC (n 4).

⁷ See for example as discussed in Office of Financial Research, ‘Asset Management and Financial Stability’ (2013) 10–23.

⁸ Asset managers also manage assets for clients - mainly institutional clients, such as pension funds - via discretionary mandates. Based on such mandate, the asset manager manages the client’s assets segregated from other clients’ assets following a predefined set of rules and principles. In 2015, a bit less than half of the assets under management in Europe were managed via discretionary mandates. In this chapter, we do

We will consider the principal-level analysis of asset managers and their funds and investigate whether they generate systemic externalities, which distort the trade-offs made within the *business model*. The analysis consists of three steps. First, we determine the ‘business model’ of asset managers and their funds, i.e. their strategy to generate revenue for the shareholders or ‘principal’. Then, we look for features of the business model that could pose a threat to financial stability and generate systemic externalities. A variety of funds exist with differing features to accommodate the specific needs of the investors. The chapter considers seven different categories of these features of funds, exploring in each case their potential systemic relevance. Finally, the chapter determines whether the pursuit of profit under the business model encourages the presence and severity of these systemic externalities. The chapter uses three stylised examples of funds to illustrate the analysis.

Top 10 biggest asset managers worldwide	Total AUM end of 2018 (USD millions)
1. BlackRock	\$5,975,818
2. Vanguard Group	\$4,866,611
3. State Street Global	\$2,511,297
4. Fidelity Investments	\$2,424,697
5. Allianz Group	\$2,242,972
6. J.P. Morgan Chase	\$1,987,000
7. Bank of New York Mellon	\$1,722,000
8. Amundi	\$1,714,466
9. Capital Group	\$1,677,381
10. AXA Group	\$1,628,579

Table 1 Top 10 biggest asset managers worldwide - Source: Willis Towers Watson Ranking 2019

not discuss these separate accounts. A survey by SIFMA shows that the portfolios of separate accounts employ little leverage and predominantly invest in liquid securities. Moreover, redemption risks – as discussed later in this chapter – will be limited for these accounts, because investors tend to internalise the costs of their sales thereby removing first-movers advantages, see European Fund and Asset Management Association, ‘Asset Management in Europe. Facts and Figures’ 47, 23; IMF (n 2) 122; SIFMA, ‘Comments to the FSB and SEC on Assessment Methodologies for Identifying Non-Bank Non-Insurer G-SIFIs’ (2014) <<https://www.sifma.org/wp-content/uploads/2017/05/sifma-amg-submits-comments-to-the-fsb-and-sec-in-response-to-ofr-study-and-in-regards-to-separate-accounts.pdf>>.

Top 10 biggest banks worldwide	Total assets end of 2018 (USD millions)
1. Industrial & Commercial Bank of China	4,027,440
2. China Construction Bank	3,376,520
3. Agricultural Bank of China	3,287,360
4. Bank of China	3,092,210
5. Mitsubishi UFJ Financial Group	2,812,880
6. JPMorgan Chase & Co	2,622,530
7. HSBC Holdings	2,558,120
8. Bank of America	2,354,510
9. BNP Paribas	2,336,660
10. Credit Agricole Group	2,123,610

Table 2 Top 10 biggest banks worldwide - Source: S&P Global Market Intelligence's global bank rankings

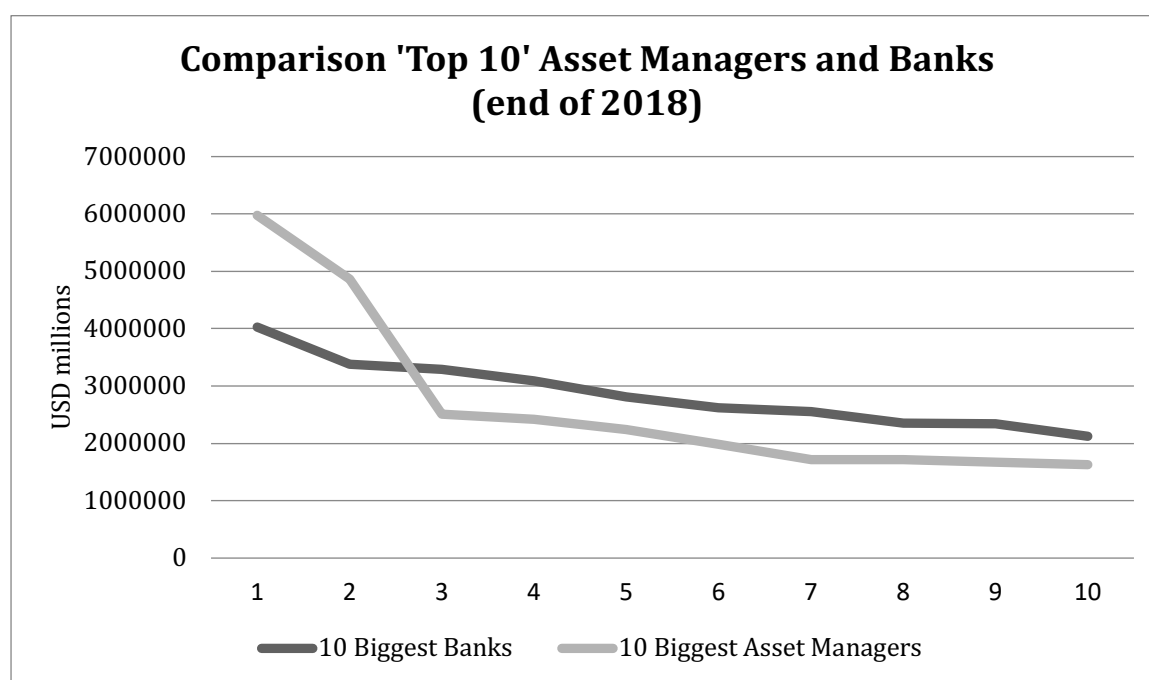


Figure 1 Comparison of the total assets of the 10 biggest banks and the total assets under management of the 10 biggest asset managers worldwide - Source: Willis Towers Watson Ranking 2019 Asset Managers and S&P Global Market Intelligence's latest global bank rankings

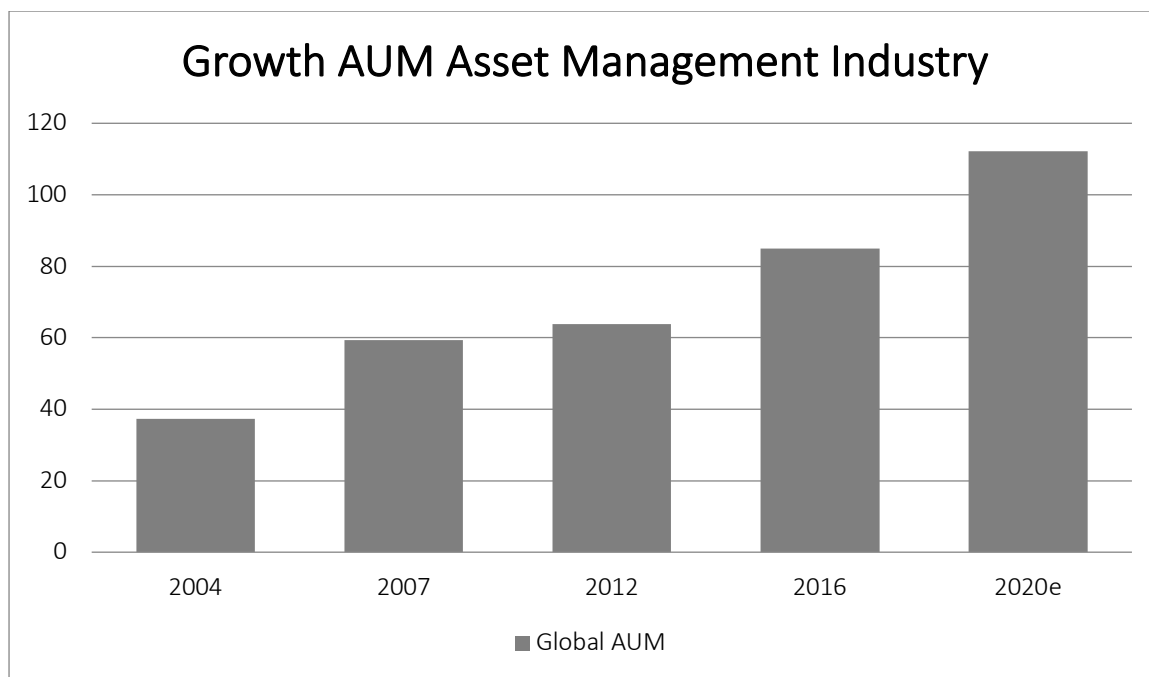


Figure 2 Global AUM in USD trillion – Source: PwC Asset & Wealth Management Revolution Report 2020

1. The business model(s)

A distinction can be made between the business model of the fund and the business model of the asset management company managing the fund.⁹ The business model of the fund, on the one hand, is determined by the specific investment strategy of the relevant fund. Asset managers – as agents of the investors in the fund – invest the fund’s capital according to a specific investment strategy in order to generate revenue for the fund’s investors. These investors can range from sophisticated investors such as pension funds, insurance companies, and sovereign wealth funds to retail investors.¹⁰ Different asset managers can have radically different strategies to generate returns for the investors in their funds.¹¹ Where some investment managers focus on certain asset classes (e.g. equity funds), others use a particular style of investing (e.g. long-short¹² funds).¹³ The returns are generated on other people’s money, namely on the funds provided by the fund’s investors. The risks related to the fund’s investments are solely borne by the investors in the fund. The asset managers – generally speaking – do not invest in the funds’

⁹ Morley characterizes the ownership structure of asset managers and their investment funds by the concept of ‘the separation of funds and managers’. Investment and management assets of the asset manager industry are held by separate entities with separate ownership structure. The funds own the investment assets (e.g. securities) and liabilities (e.g. loans and derivatives obligations). The asset managers own the management assets (e.g. contracts guaranteeing services by employees and computers) and liabilities (e.g. obligations to employees), see Morley (n 3).

¹⁰ FSB (n 1) 8.

¹¹ Joshua S Wan, ‘Systemically Important Asset Managers: Perspectives on Dodd-Frank’s Systemic Designation Mechanism’ (2016) 116 Columbia Law Review 805, 820–821.

¹² A long-short strategy is a strategy to take ‘long’ positions in securities that are undervalued and ‘short’ positions in securities that are overvalued

¹³ FSB (n 1) 5.

themselves.¹⁴ Indeed, where banks generally act as principals, asset managers invest as agents for their clients without bearing the investment risks.¹⁵

On the other hand, asset managers themselves are a separate business with their own business model, i.e. strategy to generate returns for their shareholders.¹⁶ The business of asset managers is difficult to characterise. The asset management industry differs from the banking industry in that different asset managers can have radically different business strategies.¹⁷ Broadly speaking, asset managers provide investment management services¹⁸ as agents for their clients.¹⁹ In this context, asset managers establish investment funds in order to attract capital from their clients/investors and earn fees from the management of these funds. In this sense, funds can be seen as conduits or 'products' through which asset managers provide services for a fee to their clients.²⁰

In sum, the activities of asset managers and their funds can be grouped into management company activities (e.g. centralised execution of trades and risk management for a fee) and fund level activities (e.g. asset allocation and liquidity management to earn returns).²¹ The asset manager – generally speaking – does not enter into financial transactions as a principal, but executes transactions on behalf of the funds. As a result, the asset management company's balance sheet is rather small compared to the assets under their management.²² Distress of the funds themselves, therefore, seems to raise more potential issues of systemic risk than distress of the asset manager.²³ As a result, the discussion below focuses on systemic distress resulting from fund-level activities and how the potential systemic externalities interact with the business model of funds.

¹⁴ To be clear, the faith of the asset managers and their funds are linked through a variety of mechanisms. For example, in some cases asset managers and their employees invest personal money into the fund. For instance, when an asset manager wants to sell shares in risky funds, they might want to signal their confidence in the fund's strategies by investing in it. Moreover, the asset managers and their funds are linked through regulatory (e.g. duty of care) and contractual duties as well as their brand name. Problems at the asset management company, or conversely, at the fund(s) can therefore easily spill over to the other levels, see IMF (n 2) 114.

¹⁵ FSB (n 1) 8.

¹⁶ The shareholder structure of asset managers varies across countries and firms. Outside the UK and the US, banks and insurance companies are major owners and asset managers are often part of large financial conglomerates. In the US, on the contrary, the largest asset managers are more detached from the large financial conglomerates. In the UK, some small asset managers exist on top of the large asset managers integrated in financial conglomerates, see John Armour and others, *Principles of Financial Regulation* (Oxford University Press 2016) 480; IMF (n 2) 114.

¹⁷ Office of Financial Research (n 7) 3; Wan (n 11) 820–821.

¹⁸ As described by the Office of Financial Research the activities of asset managers include 'allocating assets and selecting securities, using a variety of investment strategies in registered and non-registered funds; enhancing returns with derivatives or leverage; and creating customized investment solutions for larger clients, primarily through so-called separate accounts', see Office of Financial Research (n 7) 1.

¹⁹ Douglas J. Elliott, 'Systemic Risk and the Asset Management Industry' [2014] *Economic Studies* at Brookings 2.

²⁰ Wan (n 11) 821.

²¹ J. Elliott (n 19) 2–3.

²² FSB (n 1).

²³ FSB (n 1).

2. Systemic externalities

Generally speaking, there are two key systemic vulnerabilities associated with investment funds.²⁴ One lies in the risks resulting from the possible liquidity mismatch between a fund's investments and the redemption rights of its investors. A second potential fragility lies in the use of leverage by funds. Leverage can be used to boost a fund's profits, but it also makes such funds more vulnerable to asset price movements and liquidity constraints, with potential systemic spillovers. The extent and nature of the systemic vulnerabilities in the asset management industry vary widely depending on the particular features of the funds in question.

Hereunder, the section identifies seven fund features, which can influence a fund's systemic footprint. The section then discusses three stylised examples: a UK stock fund, a UK corporate bond index fund, and a long-short equity alternative investment fund. For each example, the section determines the potential of the fund to generate systemic externalities, given the fund's features. Moreover, besides the specific features of a fund, decisions of both investors and asset managers influence the systemic footprint of funds. The final part of the section discusses the relationship between the behaviour of asset managers and investors and the systemic impact of funds.

2.1. Systemic features

2.1.1. Open-ended vs. closed-ended funds

A first characteristic that is salient for assessing propensity to systemic risk is whether a fund is structured as 'open-ended' or 'closed-ended'. An open-ended fund does not have a set amount of assets under its management. Depending upon demand, the fund will issue or redeem shares/units on a continuous or periodic basis. A closed-ended fund, on the other hand, has a set number of shares and a fixed amount of capital invested. The fund does not issue new shares or redeem old ones. At a predetermined date or period, the closed-ended fund will liquidate its assets and redeem its shares.

From a systemic risk perspective, the open-ended or closed-ended nature of funds influences the liquidity risks faced by the fund. Liquidity management is more important in open-ended funds than closed-ended funds, as managers must remain prepared to buy back shares of funds at the discretion of the investors within the redemption terms of the fund. Managers in open-ended funds will therefore either have liquid reserves in place or face liquidity risks resulting from portfolio rebalancing to free up the cash necessary to meet redemption requests.

2.1.2. Exit rights

Closely linked to the character of funds as open-ended or closed-ended is the nature of the 'exit rights' granted to investors. This constitutes a second distinguishing feature that has potential systemic relevance. The various exit strategies available to investors boil down to permutations of two basic exit rights: secondary market liquidity and redemption rights. The first type allows investors to buy and sell the fund's shares on the

²⁴ FSB (n 1) 9.

secondary market, where the value of the shares is determined by the market price.²⁵ The second type, redemption rights, permits investors to sell their shares back to the fund in exchange for the approximate NAV, i.e. the pro rata net value of the fund's assets.²⁶ The shares are not sold on the secondary market; rather investors have a periodic (e.g. daily) option to sell their shares to the fund itself.²⁷ The fund's liabilities to its investors fluctuate depending upon the current value of the underlying assets.

Generally speaking, there tends to be an alignment between exit options and the open-ended or closed-ended nature of funds. The exit options in closed-ended funds – prior to the liquidation date – mainly depend on secondary market trading. The shares of closed-ended funds tend to trade at a discount to the NAV.²⁸ The strength of this exit option depends on the liquidity of the secondary market of the fund shares. In bad times, investors who want to exit might find it difficult to find a buyer. Such secondary market illiquidity will then lead to the fund's shares trading at an increased discount of the NAV compared to good times. For instance, in October 2008 – amidst the credit crunch – closed-ended funds traded at considerable average discount to NAV of 26 per cent.²⁹

The exit options in open-ended funds, on the other hand, rely on the strength of the redemption rights available. Redemption rights differ across a variety of dimensions impacting the strength of the exit strategy. A first dimension is the frequency of the redemption rights. Some funds allow daily redemptions, while other funds give investors the right to a pro rata share of the liquidation value of the fund after a predetermined period (e.g. five years). Other temporal constraints on redemption rights include notice of withdrawal requirements (e.g. a four month notice period), side-pocket arrangements, gates, and initial lock-up requirements (see Table 3).

²⁵ The fund issues a number of shares to investors in the primary market and investors can then – assuming market liquidity and under the conditions determined by the fund's constituent documents – buy and sell these shares through a broker on the secondary market.

²⁶ The NAV needs to be distinguished from the expected value of the investor's share. It reflects the expected value of securities in the fund's portfolio, but it does not include the future fees or portfolio changes expected in the fund itself, see Morley (n 3) 1248.

²⁷ In exchange-traded funds ('ETFs') only Authorised Participants ('APs') can redeem or create ETF shares.

²⁸ Pratt (1966) was one of the first to document and explain the discount. Since then several theories explaining the discount have been developed. Cherkes (2012) provides an overview of these theories, see Martin Cherkes, 'Closed-End Funds: A Survey' (2012) 4 Annu. Rev. Financ. Econ. 431; Eugene J. Pratt, 'Myths Associated with Closed-End Investment Company Discounts' (1966) 22 Financial Analysts Journal 79.

²⁹ Daisy Maxey, 'Closed-End Funds Feeling the Stress; Only Two New Offerings in 2008' *Wall Street Journal* (28 November 2008).

Temporal constraints on redemption rights	Description
Frequency	The frequency of redemption rights refers to the number of withdrawal dates per unit of time.
Notice of withdrawal	Notice requirements oblige investors to give advance notice of the withdrawal of their investment.
Side-pockets	A side-pocket is an account that separates certain illiquid assets from the rest of the fund's portfolio. When investors leave the fund, they cannot redeem their share in the side-pocket, but will only receive their part of the value upon realisation of the pocket.
Gates	A gate allows managers to temporarily suspend or limit redemption rights on a withdrawal date.
Initial lock-up	In the case of an initial lock-up, investors are not allowed to redeem their shares for an initial predetermined period.

Table 3 Temporal constraints redemption rights

A second dimension of redemption rights concerns the share pricing arrangements. Some funds – money market funds in particular³⁰ – promise a precise amount at redemption ('fixed NAV'), while in other funds the return is based on the value of the underlying portfolio with no guarantee of value ('floating NAV'). Some funds also impose redemption fees on investors. Other share pricing arrangements will also impact the costs of redemptions. For example, when the NAV is calculated at the end of the business day of the redemption request, investment losses and trading costs incurred in the following business days related to the redemption request will be borne by the fund and, therefore, its remaining investors. Some funds adopt share pricing rules – such as dual-pricing³¹ rules – that impose these costs on the redeeming investors.

A third dimension relates to the execution of the redemptions. Specifically, redemptions can be executed in cash or in kind. In the case of the latter, the fund returns a basket of the underlying securities instead of cash. Exchange-traded funds ('ETFs') – a new type of open-ended fund that has experienced massive growth in recent years – typically allow for redemptions in kind.³²

³⁰ Money market funds are undertakings that manage their assets so as to keep the NAV equal to par value.

³¹ In the case of dual pricing, the fund uses a different buy ('offer price') and sell price ('bid price') for shares or units in the fund. The buy price will normally be higher than the sell price. Such bid/ask spread can provide a buffer for the remaining investors to cover for the costs of rebalancing the portfolio.

³² Todd J Broms and Gary L Gastineau, 'New Financial Instruments and Institutions: Opportunities and Policy Challenges' in Yasuyuki Fuchita and Robert E Litan (eds), *New financial instruments and institutions [electronic resource]: opportunities and policy challenges* (Brookings Institution Press 2007) 198.

ETFs cut through this alignment between exit options and the open-ended nature of funds. The exit strategy in ETFs consists of *both* (relatively strong) redemption rights and secondary market liquidity. The mechanism works as follows. The majority of investors do not directly deal with the ETF and simply trade in ETF shares on an exchange. Only Authorised Participants ('APs') can redeem or create ETF shares at the ETF level in exchange for the basket of the underlying securities. They will do so whenever there is a price discrepancy between the ETF shares and the underlying securities. This ensures that the market price for ETF shares stays closely aligned with the NAV of the underlying securities of the ETF. Consider the scenario where the market price of the ETF shares is lower than the market price of the underlying assets: APs can gain from arbitrage by redeeming ETF shares in exchange for a basket of the underlying securities, which it can then sell on the underlying market.

From a systemic risk perspective, strong redemption rights in open-ended funds are a potential red flag when assessing the liquidity risks of funds. In the case of large redemptions, the fund will have to sell portfolio holdings in order to generate the cash necessary to meet the redemption requests. Trading of shares on the secondary markets, in contrast, does not affect the liquidity needs at the fund level. Referring back to the redemption features discussed above, funds with strong redemptions rights will impose few temporal constraints, have share pricing rules that provide guaranteed minimum NAV and impose investment losses and trading costs on the remaining investors, and execute redemptions in cash. A high frequency of redemption requests can force asset managers to sell off illiquid assets. Moreover, the share-pricing rules can create first-mover-advantages in the exercise of redemption rights by imposing the costs of redemptions on the remaining shareholders. Finally, redemption in cash means that early redeemers are able to impose the costs of selling illiquid assets in the market to free-up cash to meet redemption requests upon remaining investors. In contrast, redemption in kind means that every investor gets a similar basket of securities upon redemption, preventing cherry picking by early redeemers.³³

2.1.3. Liquidity of underlying assets

The asset management industry differs from banking in the sense that different firms can have drastically different investment strategies. One key characteristic of the investment strategy is the *liquidity* of the underlying assets, i.e. the ease with which an asset is traded. Liquidity refers to the ability to buy and sell large amounts of the asset at low trading costs (such as trade-processing costs, search and delay costs, and market impact costs). Liquid assets include for instance cash, central banks reserves, or securities guaranteed by sovereigns that have zero per cent risk-weight. Illiquid assets include for example equity in private companies and real estate investments.

The liquidity of an asset may vary in time. During the liquidity crisis following the bankruptcy of Lehman Brothers, assets that – generally speaking – were considered highly liquid turned out to be completely illiquid in the months following the bankruptcy.³⁴ The Brunnermeier and Pederson model shows that under certain conditions liquidity can suddenly dry up. This is because when speculators' capital is abundant, the market must be in a liquid equilibrium: liquid markets lead to favourable

³³ Blackrock, 'Bond ETFs: Benefits, Challenges, Opportunities' [2015] Viewpoint 1.

³⁴ Aldo Soprano, *Liquidity Management : A Funding Risk Handbook* (Wiley 2015) 5.

funding conditions for speculators, which in turn make the market liquid. If speculator's capital is reduced to a critical point, the liquidity in the market will switch to a low liquidity equilibrium: illiquid markets result in unfavourable funding conditions, which will prevent speculators from making the market liquid.³⁵

Given strong redemption rights, illiquid investments create a mismatch between the fund's investments and the redemption rights of the fund's investors. Funds vary in the extent to which they sustain such a liquidity mismatch. At one end of the spectrum, some funds provide weak redemption rights and invest in illiquid assets. In private equity, for example, the assets are illiquid with investors' funds often locked-in for several years. At the other end of the spectrum, liquid investments are combined with strong redemption rights, for example a mutual fund that invests in blue chip public equities.³⁶ Problematic from a systemic perspective, however, are funds that provide strong redemption rights but invest in illiquid assets. For example, bond mutual funds – especially corporate and emerging market debt mutual funds – allow investors to redeem easily, but do not always invest in liquid assets that can easily be sold to cover possible redemptions.³⁷ Moreover, as discussed in the previous paragraph even supposedly 'liquid' assets can become illiquid in some states of the world. As a result, the anticipated matching of asset liquidity and investor redemption rights may be upset if the asset liquidity characteristics change. This means that it is difficult to completely exclude – ex-ante – a mismatch between the fund's investments and the redemption rights.

³⁵ Markus K Brunnermeier and Lasse Heje Pedersen, 'Market Liquidity and Funding Liquidity' (2009) 22 Review of Financial Studies 2201.

³⁶ FSB (n 1) 12.

³⁷ For an overview of the mismatch in the different types of funds, see figure 3.5 IMF (n 2).

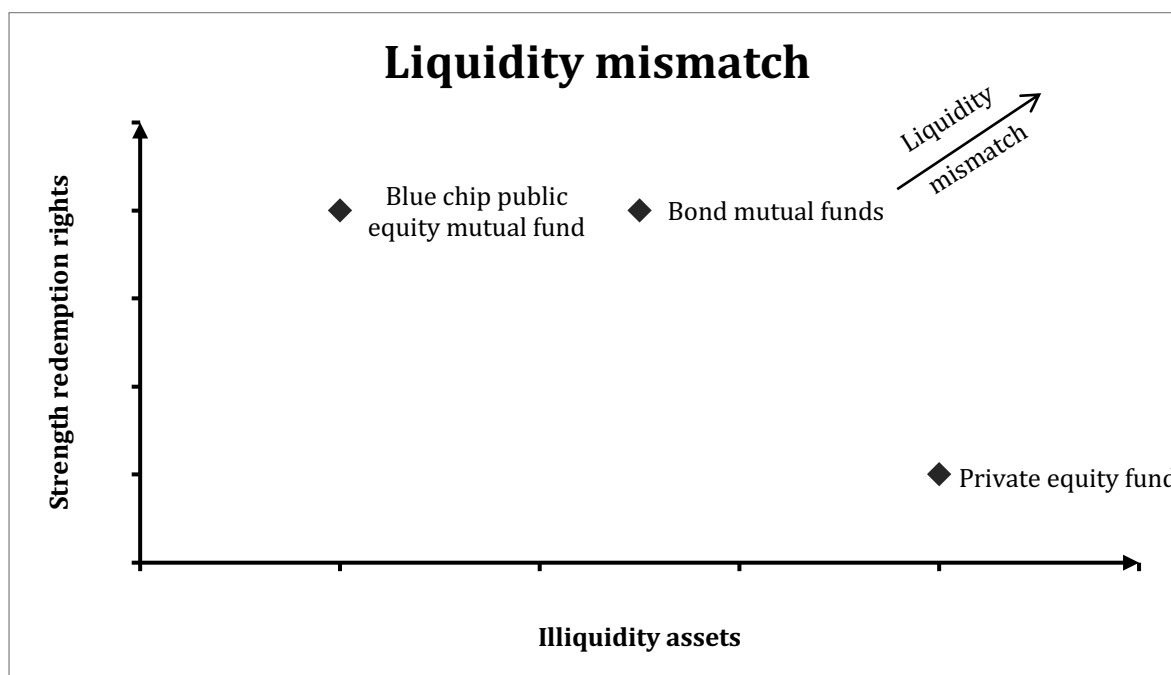


Figure 3 Liquidity mismatch in funds³⁸

2.1.4. Degree of leverage

Furthermore, investment funds differ in the extent to which they use *leverage*. Although, there is no universally accepted definition³⁹, 'leverage' generally refers to the use of mechanisms—classically, borrowing—to increase an institution's risk beyond what would be possible through direct investment of that institution's own funds. In other words, leverage increases the fund's exposure relative to its equity capital. A fund can acquire leverage in a variety of ways, including the borrowing of funds from other market participants ('balance-sheet-leverage'), use of financial instruments with embedded leverage, such as derivatives⁴⁰ ("synthetic leverage"), and re-investment of cash collateral given by counterparties.⁴¹

By increasing leverage, an institution can boost the profits of its investments. Imagine a firm with 1 million of equity. The firm invests its entire equity in assets that yield 0.15 million in profits at the end of the year, a 15% annual rate of return. The firm could leverage its operations by borrowing an extra 1 million at an annual interest rate of 5% yearly and investing 2 million in the same class of assets. The cost of borrowing is 0.05 million. At the end of the year, the firm must repay 1.05 million, but – assuming the

³⁸ This figure is based on a more detailed figure in IMF (n 2) 104.

³⁹ See for some sample definitions of leverage European Banking Federation, 'Bank Leverage and Its Economic Implications' (2010) 24–25.

⁴⁰ Derivatives allow investors to increase their exposure to the market fluctuations in the derivative's underlying reference asset beyond the investors' investment in the derivative itself, see Office of Financial Research (n 7) 17.

⁴¹ FSB and IOSCO, 'Assessment Methodologies for Identifying Non-Bank Non-Insurer Global Systemically Important Financial Institutions' (2015) 32 <<http://www.fsb.org/wp-content/uploads/2nd-Con-Doc-on-NBNI-G-SIFI-methodologies.pdf>> accessed 28 October 2017.

same return on in the investment – will have 0.3 million in profits. This yields a net profit of 0.25 million on the original 1 million equity: a 25% annual rate of return.

But leverage can also increase the losses of investments. Imagine now that the investment yields a 15% loss. In the unleveraged scenario, the company loses 0.15 million (15% of 1 million investment) of its initial equity. However, in the leveraged scenario, the company loses 0.35 million (15% loss on 2 million + a fixed 5% interest cost on the borrowed 1 million). This gives a loss of 0.35 million on the original 1 million equity, which is a 35% loss instead of 15%. We can see from this example that leverage raises potential profits by increasing the volatility of the fund's returns.

Leverage makes a fund more vulnerable to financial distress in two ways. First, leverage increases the fund's exposure relative to equity capital and therefore the likelihood that losses will exceed its capital, leading to insolvency. Take the previous example. In the leveraged scenario, the fund must return 1.05 million to its creditors at the end of the year. If the investment results in losses greater than 0.95 million (i.e. a 47.5% loss on the 2 million investment), the fund will be unable to repay its creditors and become balance-sheet insolvent. Second, leverage makes a firm also vulnerable to liquidity constraints. Negative price movement might induce margin calls⁴² and increased haircuts⁴³, necessitating significant sales of assets to meet the obligations of their creditors. In addition, liquidity risk is especially high in the case long-term assets are financed by short-term loans. If short-term funding fails to rollover in distressed times, funds might be forced to close long-term positions at significant cost in order to pay back their creditors.

Leverage also increases the contagion effects of a fund's financial distress on other companies by increasing other companies' exposure to the fund ('counterparty' or 'exposure' channel) and by increasing the size of any asset liquidations the fund must undertake when managing its financial problems ('asset liquidation channel').

Leverage was an important component of the investment strategy used by Long-Term Capital Management ('LTCM'), a US hedge fund whose failure in 1998 raised awareness regarding the systemic risk posed by hedge funds.⁴⁴ LTCM's business model relied on 'fixed-income' arbitrage. More specifically, they generated profits by exploiting market inefficiencies in mainly the government bond market. These arbitrage activities only generated a small amount of profit.⁴⁵ LTCM therefore used significant amount of leverage to boost the returns for its investors.⁴⁶ The lax standards related to margin

⁴² A 'margin call' refers to the demand by a counterparty to deposit further collateral, i.e. cash or securities, to cover possible losses on the positions taken.

⁴³ A 'haircut' refers to the difference between the market value of collateral and the value assigned to it when used as collateral. A haircut is applied to account for possible fluctuations in the market price of the collateral. The less predictable the asset's price and the lower risk the risks associated with the collateral, the lower the haircut. For example, the haircut on Treasury Bill will be lower than the haircut on corporate bonds.

⁴⁴ For a detailed description of factors contributing to the collapse of LTCM, the rescue of LTCM, the aftermath, and the lessons learned from the collapse, see Lloyd S Dixon and others, 'Hedge Funds and Systemic Risk' (RAND 2012) 31–38 <<http://site.ebrary.com/id/10678746>> accessed 19 October 2014.

⁴⁵ 'As a partner of Long-Term Capital Management put it before the fund collapsed, their strategies amounted to vacuuming pennies – though others have described hedge fund strategies as picking up pennies in front of a steamroller.', see René M Stulz, 'Hedge Funds: Past, Present, and Future' (2007) 21 *Journal of Economic Perspectives* 175, 182.

⁴⁶ LTCM has a leverage ratio of more than 20-to-1, which was significantly above market average: 'a third of hedge funds reportedly do not borrow at all, and, of those that do borrow, 54 percent borrow no more than the amount of equity their investors put in the fund. Of those that borrow more, it is rare that leverage

requirements and haircuts in the derivatives market and on repurchase agreements allowed LTCM to obtain such high levels of leverage.⁴⁷ However, the Asian financial crisis and the threat of Russia defaulting on its government debt resulted in significant losses on LTCM's positions. These losses were exacerbated due to LTCM's high degree of leverage.

The US authorities⁴⁸ were worried that a disorderly collapse of LTCM would cause systemic spillovers through the counterparty channel and the asset liquidation channel.⁴⁹ First, regarding the counterparty channel, LTCM was highly interconnected with the major banks and securities firms. The failure of LTCM could possibly compromise these systemically important players. Second, regarding the asset liquidation channel, LTCM was an important player in many of the markets they operated in. As a result, authorities were worried that the unwinding of LTCM's complicated portfolio would have resulted in fire sales on the relevant markets affecting other important market participants. In the end, the Federal Reserve Bank of New York stepped in and organised a private⁵⁰ bailout by the major creditors.

2.1.5. Size

Furthermore, the size of a fund will affect its systemic footprint. In particular, size can provide an indication of the impact of distress at the fund on other financial institutions and markets. Firstly, the larger a fund the more likely that distress will lead to a disruption of the provision of a critical product or service to the market. Fire sales of positions, moreover, will only result in price dynamics and market volatility, if the fund's positions are significant relative to the normal trading volume or to the total size of the market. In sum, the size criterion is especially relevant to assess the impact of a fund's distress on the wider economy, rather than the fragility of the fund itself.⁵¹ For example,

exceeds ten to one', see Franklin R Edwards, 'Hedge Funds and the Collapse of Long-Term Capital Management' (1999) 13 *Journal of Economic Perspectives* 189, 198.

⁴⁷ Dixon and others (n 44) 32.

⁴⁸ In his later statement, Greenspan observed that the unwinding of LTCM's portfolio 'would not only have a significant distorting impact on market prices but also in the process could produce large losses, or worse, for a number of creditors and counterparties, and for other market participants who were not directly involved with LTCM', see Alan Greenspan, 'Statement by Alan Greenspan, Chairman, Board of Governors of the Federal Reserve System, before the Committee on Banking and Financial Services, US. House of Representatives, October 1, 1998' (1998) <<https://www.federalreserve.gov/boarddocs/testimony/1998/19981001.htm>> accessed 10 December 2019.

⁴⁹ Dixon and others (n 44) 33.

⁵⁰ The Federal Reserve bank of New York emphasized the private character of the bailout, in the words of William J. McDonough, president of the Federal Reserve Bank of New York: 'First, this was a private sector solution to a private-sector problem, involving an investment of new equity by Long-Term Capital's creditors and counterparties [...] control of the Long-Term Portfolio passed over to this 14 firm creditor group and the original equity holders have taken a severe hit [...] no Federal Reserve official pressured anyone, and no promises were made. Not one penny of public money was spent or committed', see William J McDonough, 'Statement by William J. McDonough, President, Federal Reserve Bank of New York, before the Committee on Banking and Financial Services. U.S. House of Representatives, October 1 1998' (1998) <<https://www.federalreserve.gov/boarddocs/testimony/1998/19981001.htm>> accessed 12 October 2019.

⁵¹ Authority To Require Supervision and Regulation of Certain Nonbank Financial Companies, 12 CFR Part 1310, 21641 and 21659.

as argued below, significant sales in the corporate bond market could affect corporate bond interest rates for companies, impairing their ability to raise debt financing.

Size tends to refer to the size of one (group of) financial institution(s). FSOC, for example, applies a 50 billion threshold in total consolidated assets, before assessing the systemic significance of non-bank financial institutions.⁵² It is not unlikely that an individual fund would meet such threshold. For example, the assets under the management of LTCM peaked at around \$125 billion.⁵³ However, even if funds individually are small, their movements can be correlated⁵⁴ and impact financial markets and its participants as part of a large ‘herd’.⁵⁵ This lays bare the need for macroprudential oversight of such correlations.⁵⁶

2.1.6. Managerial discretion

Next, the managerial discretion to take decisions will vary widely across funds. Asset managers exercise a level of discretion with regard to the day-to-day investment activity, asset allocation, and risk management decisions of the funds. Asset managers make these decisions on behalf of the investors of the fund. The limits within which asset managers can make these decisions are set out in the written documentation put in place as part of the fund’s establishment, the fiduciary duties of the asset manager, and regulatory limits.

Some asset managers’ discretion is substantially limited through predefined or ‘rule-based’ restrictions, which require asset managers to follow specific rules independent of the state of the market. For instance, investment restrictions often require managers to limit exposure to non-investment grade investments. In bad times, rating downgrades could force managers to sell-off investments in order to prevent violation of the investment restrictions.⁵⁷ In addition, regulatory intervention in the industry has imposed predefined constraints on managerial discretion. For instance, the UCITS directive allows managers to temporarily suspend redemptions “*where suspension is justified having regard to the interests of the unit-holders*”.⁵⁸

The impact on systemic risk of rule-based restrictions has become particularly relevant given the popularity of index ETFs and the expected advance of computerised trading based on machine-learning and artificial intelligence. Index or ‘passive’ funds – i.e. funds that track a specific index – simply require managers to replicate the performance of the index. Where managers in active funds buy and sell assets based on their value judgments, managers in passive funds buy and sell assets mainly due to changes in the index.⁵⁹ Algorithmic trading, furthermore, no longer relies on human discretion, but on algorithms making the decisions.

⁵² Authority To Require Supervision and Regulation of Certain Nonbank Financial Companies, 12 CFR Part 1310, 21643.

⁵³ Dixon and others (n 44) 92.

⁵⁴ See for example in emerging market economies Ken Miyajima and Ilhyock Shim, ‘Asset Managers in Emerging Market Economies’ [2014] BIS Quarterly Review 19.

⁵⁵ Markus Brunnermeier and others, *The Fundamental Principles of Financial Regulation: Geneva Reports on the World Economy 11* (International Center for Monetary and Banking Studies 2009) 26.

⁵⁶ Joshua Aizenman, Yothin Jinjark and Huanhuan Zheng, ‘Measuring Systemic Risk Contribution of International Mutual Funds’ [2016] ADBI Working Paper Series 1, 10.

⁵⁷ Blackrock, ‘Who Owns the Assets?’ (2014).

⁵⁸ Article 84 UCITS Directive.

⁵⁹ Martin Gold, *Fiduciary Finance : Investment Funds and the Crisis in Financial Markets* (Edward Elgar 2010) 49–50.

These predefined restrictions are problematic when they are shared across funds and widely adopted, as it increases the likelihood that multiple funds will take similar decisions at similar times increasing the possible market impact of these decisions. This could for instance be the case when machines start working on the same available data, coming to similar conclusions at similar times.⁶⁰ Moreover, regulatory intervention can create correlated behaviour by imposing regulatory limits on managerial discretion across funds. Take the obligation in the UCITS directive to use the right to suspend redemption rights in the interests of investors. Such an obligation could prevent managers from deciding in favour of suspension in the interest of systemic stability for fear that such a decision would violate their fiduciary duties to investors.

2.1.7. Compensation arrangements

Given a level of discretion left to asset managers to make investment decisions for funds, an asset manager's compensation becomes an important mechanism to incentivise them to maximise returns for the fund – and therefore its investors – within a certain risk profile. The primary aim of private compensation structures is therefore to align the interests of the asset manager with those of the investors in the fund.

There are two main ways of remunerating asset managers for the management of the fund's portfolio.⁶¹ First, asset managers can receive management fees. The management fee of a fund is typically calculated as a percentage of the assets under management ('AUM'). The percentage varies widely across funds, but will generally be lower for passive funds⁶² than for active funds⁶³. This compensation structure makes the asset managers de facto equity investors, as they receive a percentage of the fund's assets.⁶⁴ Management fees align the incentives of asset managers and fund investors by rewarding relative performance – indirectly – through fund inflows.⁶⁵ Put differently, to the extent that investment decisions by investors are made by comparing the fund's performance against peers and benchmarks, this type of remuneration indirectly incentivizes managers to perform well – relatively speaking – in order to attract fund flows.⁶⁶ However, compensation based on AUM might also encourage fund managers to chase AUM through marketing spend rather than performance. The importance of marketing relative to performance will depend on how investors come to select the funds in which they invest and in particular their level of sophistication. To some extent, this type of compensation might also create incentives to grow the fund's asset under management beyond its 'optimal' size. Indeed, some types of funds have decreasing

⁶⁰Nikolaos Panagirtzoglou, 'The Bionic Invisible Hand' (2018) <<https://deconstructingrisk.com/2018/02/04/the-bionic-invisible-hand/>>.

⁶¹ H Kent Baker, Greg Filbeck and Victor Ricciardi, *Financial Behavior: Players, Services, Products, and Markets* (2017) 136–137.

⁶² Passive funds are funds which invest in a predefined set of securities - most commonly the securities in an index – without intending to beat the market.

⁶³ Active funds aim to outperform a benchmark by actively selecting securities.

⁶⁴ Yingcong Lan, Neng Wang and Jinqiang Yang, 'The Economics of Hedge Funds: Alpha, Fees, Leverage, and Valuation' [2011] NBER Working Paper Series 1, 2.

⁶⁵ BIS, *Incentive Structures in Institutional Asset Management and Their Implications for Financial Markets* (2003) 22.

⁶⁶ Baker, Filbeck and Ricciardi (n 61) 144.

returns to scale.⁶⁷ For instance, active funds face decreasing returns to scale, as the opportunities to outperform the benchmark become scarcer with increases in the industry's size.⁶⁸ This signals that investors of active funds have no incentive to pursue unlimited size. Passive funds seem to be unaffected by scale effects.⁶⁹

Second, some funds also charge performance fees based on the fund's profits. These are expressed as a percentage of the returns made above a benchmark level. Although performance fees have come under pressure in recent years⁷⁰, hedge funds typically charged around 2 per cent management fees and 20 per cent performance fees for profits over its high water mark ('HWM'), i.e. the historically highest level of a fund's AUM upon which performance fees have previously been calculated. The HWM ensures that the fund managers will only receive performance fees when previous losses are recovered. However, as will be discussed in more detail below, the structure also creates an asymmetric pay-off structure by giving managers an uncapped share of the profits, while also guaranteeing a percentage of the AUM to cover costs. This will encourage excessive risk-taking by managers, for example through increased leverage or increased investment in illiquid assets. To the extent a fund presents systemic concerns, such behaviour will exacerbate the fragilities.

2.1.8. Conclusion

Liquidity mismatches and the use of leverage determine the extent to which a fund is vulnerable to liquidity and insolvency problems. Performance fees will encourage managers to take more risk in this respect. These fund-level problems in turn can become system-level problems through contagion. There are three main contagion channels: counterparty channel, asset liquidation channel, and critical function channel. First, the counterparty channel allows the risks to spread by compromising the fund's counterparties. Second, the asset liquidation channel refers to the systemic risk from disruptive sales of illiquid assets, which negatively affects asset prices and all the actors exposed to these assets. Distress is spread not because of direct contractual links, but through exposure to similar assets. Third, the critical function channel considers the risk to the system when a financial institution can no longer perform a critical service to the financial system for which there are no substitutes.⁷¹ Size will be an important determinant for contagion both in the form of individual size and correlated selling (e.g. in the case of rule-based decision-making).

Table 4 shows a dashboard, which summarises the above analysis and can be used to assess the systemic importance of funds based on the presence of certain systemic features. In order to determine the risk of systemic externalities, the analysis distinguishes between principal-level and system-level risks created by these features.

⁶⁷ Stan Beckers and Greg Vaughan, 'Small Is Beautiful. An Attempt to Quantify the Comparative Disadvantage of Large Asset Managers' [2001] *The Journal of portfolio management* 9.

⁶⁸ Luboš Pástor and Robert F Stambaugh, 'On the Size of the Active Management Industry' (2012) 120 *Journal of Political Economy* 740; Luboš Pástor, Robert F Stambaugh and Lucian A Taylor, 'Scale and Skill in Active Management' (2015) 116 *Journal of Financial Economics* 23.

⁶⁹ Georgios Magkotsios, 'Industry-Level Returns to Scale and Investor Flows in Asset Management' [2017] working paper.

⁷⁰ Chris Flood, 'Hedge Funds Forced to Cut Fees to Lure Investors' *Financial Times* (19 February 2018) <<https://www.ft.com/content/b889c3b8-1254-11e8-940e-08320fc2a277>> accessed 22 February 2018.

⁷¹ FSOC, 'Basis for the Financial Stability Oversight Council's Final Determination Regarding MetLife, Inc.' (2014).

The distinction is based on the locus of the consequences of the presence of certain features. Principal-level risks are borne by the principal and will be included in the trade-offs made by the business model. This includes liquidity and insolvency risk. System-level risks, on the other hand, are borne the system as a whole and – to the extent there is no contractual or institutional relationship between the affected parties and the financial institution – these risks can be externalised onto these parties. The presence of a systemic feature increases the principal-level risk and the system-level risk generated by the fund. An increase in risk is indicated on the dashboard through the use of a ‘+’ sign. The more pluses under a certain risk category, the more risk a fund presents.⁷² The dashboard has been applied to four funds (F1, F2, F3, and F4) with differing features. F1, for example, suffers from a liquidity mismatch, as it is funded through short-term funding (indicated through ‘yes’) and invests in illiquid assets (indicated through ‘yes’). This results in increased liquidity risk at the principal-level and increased risk of systemic losses through the asset liquidation channel. The table makes clear that the more systemic features are present, the more risks the funds present both at the principal-level and the system-level.

Systemic features	F 1	F 2	F 3	F 4
Runnable/short-term funding	Yes	Yes	Yes	Yes
Illiquid assets	Yes	Yes	Yes	Yes
Leverage	No	Yes	Yes	Yes
Size/Correlated decisions	No	No	Yes	Yes
Performance fees				Yes
Principal-level risk				
Liquidity risk	+	++	++	+++
Default risk	0	+	+	++
System-level risk				
Counterparty channel	0	+	++	+++
Asset liquidation channel	+	++	+++	++++
Critical function channel	0	0	0	0

Table 4 Systemic dashboard funds

2.2. Three examples

In this section, we consider three stylised examples of funds with differing combinations of the features outlined in the previous section and that – as a result – pose varying challenges from a systemic risk perspective. The first two examples assume an unlevered balance sheet. The balance sheet of an unlevered fund is purely financed through the shares or equity-like ‘units’, which investors receive in return for their investment. As a result, insolvency is less prominent in the systemic assessment of these funds than it is

⁷² This set-up assumes the same weight for all risks. However, in reality this is not necessarily the case. However, the aim of the dashboard is to merely visualise the types of risks specific systemic features present rather than making claims related to their relative weighting.

for banks or other levered financial institutions. The third example illustrates possible systemic concerns in levered funds.

2.2.1. UK stock fund

2.2.1.1. Fund description

Investment strategy – The first example is a UK equity income fund.⁷³ The investment policy of the fund is to invest its value in the UK large cap public equity market across diversified sectors to achieve long-term capital growth. It has a NAV of £500 million. The fund also maintains cash reserves to meet redemptions or pay expenses and charges operating expenses of 1 per cent of the AUM. No leverage is used.

Management structure – The management of the fund's assets is delegated to the asset manager, who has discretion to select the portfolio securities. The asset manager will buy securities for a variety of reasons, such as earnings growth potential or undervaluation of the stock, and will sell securities to realise gains, limit losses, meet redemption requests, etc. Buying and selling of stock will result in trading costs, such as dealer commissions. The operating expenses include 0.70 per cent of the NAV for management fees to be paid to the asset manager. No performance fee is charged.

Redemption terms – The fund is open-ended and investors have the right to redeem their shares at their NAV as calculated at the end of the business day. The settlement of the redemption request will be no later than the close of business of the third business day after the business day on which the redemption request was received. The fund does not charge redemption fees.

2.2.1.2. Systemic stability concerns

The fund is unlevered, which eliminates the systemic concerns related to the use of leverage. More specifically, it eliminates the increased liquidity and default risk related to leverage, which could lead to spillovers to the rest of the financial system and the real economy through the counterparty channel and asset liquidation channel (see Table 5). Next, we consider whether possible vulnerabilities exist due to liquidity mismatch. Indeed, one of the key systemic concerns in the asset management industry is that the liquidity mismatch between the fund's investments and the redemption rights of investors could lead to a similar scenario to that of the classic bank run. During a bank run, depositors run to withdraw their deposits because of fears that the bank might fail and the liquidation of the bank's assets will not be sufficient to cover the deposits. Such a dynamic could even result in the failure of financially healthy banks, as banks will be forced to sell off illiquid loans at fire sale prices in order to meet withdrawals.

In the current example, this is unlikely to be the case. In contrast to bank loans, the underlying assets of a UK stock fund are very liquid. Indeed, large cap UK equity markets are considered very liquid and deep, even in crisis times. As a result, the fund will be able to quickly sell off its assets to meet redemptions without excessive trading costs and loss

⁷³ This stylised example is based on the Franklin UK Equity Income Fund, which aims to beat the FTSE All-Share Index.

of value. This eliminates first-movers advantages to the extent that the ease of selling large cap UK equity ensures that the remaining investors will not suffer a decline in value of the fund's portfolio due to fire sale losses.⁷⁴ Moreover, as the equity securities are traded many times a day, the market price will be quick to adjust in response to shocks. As a result, the NAV at the end of the business day will be based on the market price of the securities that reflects the most recent information. Early redeemers will therefore unlikely be able to profit from a possibly higher, but stale quoted, market price when the NAV is calculated.⁷⁵ In other words, the set-up of the fund makes liquidity problems related to a liquidity mismatch – which could spill over to the rest of the financial system and the real economy through the asset liquidation channel – unlikely (see Table 5).

Systemic features	Stock Fund
Runnable/short-term funding	Yes
Illiquid assets	No
Leverage	No
Size/Correlated decisions	No
Performance fees	No
Principal-level risk	
Liquidity risk	0
Default risk	0
System-level risk	
Counterparty channel	0
Asset liquidation channel	0
Critical function channel	0

Table 5 Systemic dashboard UK stock fund

2.2.2. UK Corporate bond index fund

2.2.2.1. Fund description

Investment strategy – The second example is a UK corporate bond index fund. The fund aims to achieve returns for investors by tracking closely the performance of the S&P UK Investment Grade Corporate Bond Index. It has a NAV of £50 million. The fund also maintains cash reserves to meet redemptions or pay expenses. The operating expenses are 0.3 per cent of the assets under management. No leverage is used.

Management structure – The management of the fund's assets is delegated to the asset manager with a mandate to closely track the returns of the index by investing in the bonds contained in the index. The operating expenses include 0.2 per cent of the NAV for management fees to be paid to the asset manager. No performance fee is charged.

⁷⁴ Qi Chen, Itay Goldstein and Wei Jiang, 'Payoff Complementarities and Financial Fragility: Evidence from Mutual Fund Outflows' (2010) 97 Journal of Financial Economics 239.

⁷⁵ Chen, Goldstein and Jiang (n 74); Jeffrey N Gordon and Christopher M Gandia, 'Money Market Funds Run Risk: Will Floating Net Asset Value Fix the Problem' [2014] Colum. Bus. L. Rev. 313, 327.

Redemption terms – The fund is open-ended and investors have the right to redeem their units at their NAV as calculated at the end of the business day. The settlement of the redemption request will be no later than the close of business of the third business day after the business day on which the redemption request was received. The fund does not charge redemption fees.

2.2.2.2. Systemic stability concerns

Illiquid bond market

The previous example of a systemically safe UK equity fund assumed the liquidity of the underlying assets of the fund in order to meet daily redemption requests, even in stressed times. This is not necessarily the case for corporate bond funds. More specifically, in recent years, practitioners have voiced concerns about the liquidity in the corporate bond market.⁷⁶ It is argued that due to regulatory changes post-crisis – in particular increased capital and liquidity requirements – banks, brokers and other traditional liquidity providers incur increased costs to hold inventories of securities, impairing their ability to provide market-making services. This badly affects the liquidity in the corporate bond market.⁷⁷ Moreover, in the OTC market, the bond issuance is fragmented, with corporations issuing a variety of bonds with different characteristics, such as maturity dates and coupon payments. As a result of such fragmentation, the different types of bonds trade on an irregular basis.⁷⁸ Regulators, on the other hand, found little evidence that the liquidity of the corporate bond market has significantly deteriorated since the financial crisis.⁷⁹ A recent study commissioned by the European Commission, however, found that if price-based measures for liquidity are conditioned on risk, the trading costs for bonds with a given level of volatility have significantly increased since the crisis.⁸⁰ Moreover, another study by the European Commission found that the sensitivity of bond liquidity to the specific characteristics that drive European bond liquidity – such as duration, rating, and time to maturity – is larger when markets are under stress.⁸¹ Although we do not take a stance in this on-going debate, the concerns raised shed – at the very least – doubt on the liquidity of the corporate bond market, especially during stressed times. This provides for the first building block in the discussion of the systemic concerns in index funds.

⁷⁶ For an overview of the arguments, see Risk Control Limited, 'Report to EC "Drivers of Corporate Bond Market Liquidity in the European Union"' (2017) 20–24 <https://ec.europa.eu/info/sites/info/files/171120-corporate-bonds-study_en.pdf> accessed 25 September 2018.

⁷⁷ Goldman Sachs, 'A Look at Liquidity' [2015] Global Macro Research; iShares, 'Fixed Income ETFs and the Corporate Bond Liquidity Challenge' (2015).

⁷⁸ iShares (n 77).

⁷⁹ For an overview of the regulatory studies on the subject, see Risk Control Limited (n 76) 25–34.

⁸⁰ Risk Control Limited (n 76).

⁸¹ Clara Galliani, Giovanni Petrella and Andrea Resti, 'The Liquidity of Corporate and Government Bonds: Drivers and Sensitivity to Different Market Conditions' [2014] European Commission JRC Technical Reports.

First-mover advantages

A mismatch between the illiquidity of the underlying corporate bond market and daily redemption rights can create advantages for early redeemers, incentivising investors to run in stressed times. A parallel can be drawn with bank runs. The Diamond and Dybvig's model⁸² of bank runs explains runs by reference to the economic role of banks to transform short-term liquid liabilities into longer-term illiquid investments. Such transformation creates multiple equilibria. If confidence is maintained, banks provide efficient risk-sharing between depositors by insuring for liquidity shocks of depositors. If confidence is lost, investors will want to withdraw deposits before the bank's assets are depleted. Early withdrawals are more likely to be fully repaid, creating a dominant strategy for investors to run on the bank.

In funds, first-mover-advantages arise when the costs of redemptions are partly borne by the remaining investors. Consider a shock in the corporate bond market depressing prices – such as an announcement by the Bank of England that it will increase interest rates, feeding fears that a period of increasing interest rates has arisen – leading to heavy redemption requests.⁸³ Redemptions in excess of the 1 per cent cash buffer will lead to portfolio rebalancing (e.g. corporate bonds will be sold into the market in order to meet redemption requests). The portfolio rebalancing will often take place in the days following the redemption request and will lead to trading costs. These trading costs include commission, fees, market makers' spread, and market impact of the sales. In illiquid markets, these transactions costs could be significant. This is so if only because sales of illiquid corporate bonds can significantly impact the price of the assets on the market, especially in the case of correlated sales across multiple bond funds. When bond funds sell off large quantities of the underlying illiquid corporate bonds in fire sales, the prices of the corporate bonds can spiral down even further.⁸⁴

Redemptions, in contrast, will happen at the NAV as calculated on the end of the business day of the redemption request and will not include the trading costs related to the portfolio rebalancing after the point of NAV calculation. As a result, early redeemers will be able to externalise trading costs onto remaining shareholders. Later-to-sell investors will bear the losses of fire sales by holding onto shares in an increasingly illiquid portfolio.⁸⁵

Moreover, the illiquidity of the corporate bond market will create a stale pricing problem, i.e. that the price on the market does not yet reflect the most recent information (e.g. interest rates will increase). If the information is negative with regard to the bond value, stale prices create incentives for investors to redeem before the market price reflects the new information. Investors know that once a fire sale starts, the price will be updated to the new information, encouraging investors to redeem before other investors. Therefore, independent of when the portfolio rebalancing will take place, stale pricing

⁸² Douglas Diamond and Philip Dybvig, 'Bank Runs, Deposit Insurance, and Liquidity' (1983) 91 *The Journal of Political Economy* 401.

⁸³ Office of Financial Research (n 7).

⁸⁴ See for empirical evidence Jaewon Choi and Sean Seunghun Shin, 'Liquidity-Sensitive Trading and Corporate Bond Fund Fire Sales' <<https://ssrn.com/abstract=2731844>> accessed 29 August 2018.

⁸⁵ Chen, Goldstein and Jiang (n 74); Itay Goldstein, Hao Jiang and David T Ng, 'Investor Flows and Fragility in Corporate Bond Funds' (2017) 126 *Journal of Financial Economics* 592; Wan (n 11) 823.

will ensure that the NAV used to value redemptions is unlikely to reflect the true value of the corporate bonds.⁸⁶

Systemic runs

For such runs to constitute a problem for financial stability the redemptions need to be significant and need to result in significant sales – relative to normal trading volume or total size of the market – of (illiquid) assets, leading to price declines or increases in market volatility in the market segment. These price dynamics could in turn affect other parts of the market through funding markets, balance sheet and collateral channels.⁸⁷ It could impact the stability of other financial institutions and undermine their ability to provide key finance functions in the financial market leading to severe costs to the real economy.⁸⁸ In other words, the redemptions related to a liquidity mismatch should result in liquidity problems which spill over to the rest of the financial system and the real economy through the asset liquidation channel.

Consider the previous example where an announcement by the Bank of England concerning interest rates leads to a run on corporate bond funds. If such redemptions are correlated across corporate bond funds, it is not unlikely that the resulting sales will be significant enough to impact market prices. Indeed, due to the increased capital and liquidity constraints on traditional institutional investors, such as banks, combined with the search for yield of fund investors in a low-interest environment, open-ended funds hold an increasingly large share of the corporate bond market.⁸⁹

These asset price movements could then spill-over to the real economy by impairing funding markets. Bond financing has become an increasingly important tool in corporate finance. For instance, in the UK, the issuance of tradable securities, in particular corporate bonds, accounts for almost all net credit raised since the financial crisis by non-bank financial institutions.⁹⁰ Baranova et al.⁹¹ find evidence that redemptions – under unlikely, but not impossible circumstances – can significantly affect corporate bond interest rates for companies, impairing their ability to raise debt financing. Moreover, the liquidity of the corporate bond market heavily relies on broker-dealers holding corporate bonds in their inventory. If the prices of the corporate bonds collapse, the broker-dealers might incur significant losses on their balance sheets. This in turn might prevent the broker-dealers from providing key functions to the market, exacerbating the shock.⁹²

At the end of 2015, the Third Avenue Focused Credit Fund ('FCF') – a high-yield bond mutual fund – had to ask permission of the SEC to suspend redemptions. FCF's portfolio was more illiquid and had higher exposure to distressed bonds than other high-yield bond funds, which were able to meet redemptions. The question remains as to what systemic consequences would have arisen if the investment strategy of other funds had

⁸⁶ For a similar argument in the context of MMF, see Gordon and Gandia (n 75).

⁸⁷ FSB (n 1) 11; IMF (n 2) 93.

⁸⁸ FSB (n 1) 12.

⁸⁹ For some empirical evidence on the increased share of corporate bonds held through mutual funds and EFTs in the US market, see IMF, *Global Financial Stability Report Moving from Liquidity- to Growth-Driven Markets April 2014* (IMF 2014) 14.

⁹⁰ Yuliya Baranova and others, 'Simulating Stress across the Financial System: The Resilience of Corporate Bond Markets and the Role of Investment Funds' [2017] Financial Stability Paper 1, 7.

⁹¹ Baranova and others (n 90).

⁹² Baranova and others (n 90) 5.

been (perceived) to be similar.⁹³ Where it exists, correlation of investment strategies of funds would increase systemic stability concerns. In sum, the set-up of the fund – and in particular the liquidity mismatch – could lead to liquidity problems which could spill over to the rest of the financial system and the real economy through the asset liquidation channel (see Table 6).

Systemic features	Index fund
Runnable/short-term funding	Yes
Illiquid assets	Yes
Leverage	No
Size/Correlated decisions	No
Performance fees	No
Principal-level risk	
Liquidity risk	+
Default risk	0
System-level risk	
Counterparty channel	0
Asset liquidation channel	+
Critical function channel	0

Table 6 Systemic dashboard UK corporate bond index fund

2.2.3. Long-short equity alternative investment fund

2.2.3.1. Fund description

Investment strategy – The third stylised example is an alternative investment fund.⁹⁴ The fund has 1 billion AUM. The operating expenses are 2 per cent. The fund invests according to the long-short strategy: it takes a long position in stock that is undervalued and a short position in stock that is overvalued.⁹⁵ In order to short stock, the fund borrows the stock from a broker at time 1 and immediately sells the stock at the current market price. The sale proceeds of the stock are credited to a margin account. The margin account has an initial margin requirement, which will be higher than the sale proceeds. For example, the initial margin requirement could be 130% of the total value of the stock. The difference between the sale proceeds and the initial margin requirement will be covered by the fund. As that difference is less than the full sale price, the transaction is leveraged. When the price of the stock increases and the initial margin drops below the maintenance margin –

⁹³ FSOC, 'Update on Review of Asset Management Products and Activities' (2016) 7–8.

⁹⁴ The description is based on the data collected in Lloyd Dixon, Noreen Clancy and Krishna B Kumar, *Hedge Funds and Systemic Risk* (RAND Corporation 2012).

⁹⁵ See for an example BlackRock, 'Prospectus Global Long/Short Equity Fund' <https://www.blackrock.com/investing/literature/prospectus/pro-brglobal-longshort-equity-inv-us.pdf?stream=reg&product=BR_GLS-AGG&shareClass=Class+I&documentId=920123%7E920094%7E920092%7E920938%7E920486&iframeUrlOverride=%2Finvesting%2Fliterature%2Fprospectus%2Fpro-brglobal-longshort-equity-inv-us.pdf> accessed 24 January 2018.

for example 120% of the total value of the stock, the fund will need to put up additional margin. This is referred to as a 'margin call'. The fund closes the short position by buying the stock back on the market at time 2. In other words, the fund gambles on the decline of the stock value between time 1 and time 2. In addition to short selling, the fund relies on derivatives to take short positions.

Management structure – The management of the fund's assets is delegated to the asset manager, who has discretion to select the portfolio's securities. The operating expenses include 1.50 per cent of the NAV for management fees to be paid to the asset manager. The fund charges 17 per cent performance fees above the HWM.⁹⁶

Redemption terms – The fund is open-ended and investors have the right to redeem their shares at the NAV. However, investors are prohibited from redeeming shares in the first year ('lock-up period') and subsequently may only withdraw investments quarterly with a 90-day notice. Withdrawals are limited to 25 per cent of the investor's investment in the fund ('gate'). Certain illiquid investments are put in 'side pockets' and the corresponding investments cannot be withdrawn until their maturity.⁹⁷ The settlement of the redemption request will be no later than the close of business of the third business day after the business day on which the redemption request was received. The fund does not charge redemption fees.

2.2.3.2. Systemic stability concerns

The redemption terms – i.e. lock-up period, notice period, gates, and side pockets – make panic runs on the fund by investors less likely, as these tools allow managers to ease redemption pressures in stressed times. The lock-up period prevents investors to redeem in the first year. Moreover, investors need to provide a 90-day notice to withdraw funds, allowing managers time for portfolio rebalancing before paying out the redeeming investors. The gate also limits withdrawals to 25 per cent of the investor's investment in the fund. Moreover, certain illiquid investments are put in 'side pockets', limiting the risk of losses due to the sale of illiquid assets in a stressed market.

However, it is the use of leverage that makes the fund more vulnerable to asset price movements and more likely to experience financial distress.⁹⁸ Where losses on a long position are capped by the price paid for the stock, the losses on a short position are unlimited as there is no cap on the increase in stock value. Moreover, in a stress situation, asset prices of collateral may decline, leading to margin calls. Unless the firm has enough liquid assets to satisfy these margin demands, it might be forced to sell illiquid assets.

⁹⁶ The standard 2-20 formula has become outdated, see Lindsay Fortado, 'Hedge Funds Fees Take a Trim' *Financial Times* (22 December 2016) <<https://www.ft.com/content/ab1ce98e-c5da-11e6-9043-7e34c07b46ef>> accessed 31 January 2018.

⁹⁷ These are standard provisions for hedge funds, see Dixon, Clancy and Kumar (n 94) 15–16.

⁹⁸ The potential systemic consequences of the failure of hedge funds have been subject to extensive debate, especially since the near-collapse of Long-Term Capital Management, see for example The President's Working Group on Financial Markets, 'Report of the The President's Working Group on Financial Markets: Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management' (1999); United States General Accounting Office, 'Long-Term Capital Management: Regulators Need to Focus Greater Attention on Systemic Risk' (1999) GAO-GGD-00-3; 'Staff Report to the United States Securities and Exchange Commission: "Implications of the Growth of Hedge Funds"' (2003).

When the fund's holdings are large relative to the market it is selling into, or when there is correlated selling, this could lead to fire sales.⁹⁹

Moreover, leverage can lead to increased interconnectedness of the financial system and, therefore, the possibility that distress at the fund-level spreads through the financial system. In particular, leverage leads to increased counterparty exposure ('counterparty risk channel') and risk of fire sales ('asset liquidation channel').¹⁰⁰

First, the counterparty channel allows the risks to spread by compromising the funds' counterparties.¹⁰¹ Hedge funds often work with one or more banks as their prime broker(s).¹⁰² The prime brokers provide key services to a hedge fund, such as clearing, custody, asset servicing, borrowing securities to establish short positions and providing the necessary funds to leverage their positions. In other words, the prime brokers provide hedge funds with the necessary financing to leverage their investments.

These prime brokerage services are an important source of income for the major financial institutions in the financial system, such as Goldman Sachs and Morgan Stanley.¹⁰³ Moreover, the same financial institutions are also major players in derivatives market. Therefore, distress at highly levered funds could compromise these important players in the market and, in turn, other hedge funds exposed to the same prime broker. Moreover, prime brokers are interconnected amongst each other through common exposures to hedge funds.¹⁰⁴

Second, the asset sales channel allows risks to spread through the sale of assets disrupting trading in the market and potentially affecting the funding function of the financial market. Leveraged funds are more likely to be forced to sell off assets in fire sales. As discussed above, negative price movement might induce margin calls and increase haircuts, necessitating significant sales of assets to meet the obligations of their creditors. If these sales are significant relative to the market the fund is selling into, or when there is correlated selling amongst market participants, this could lead to fire sales. This might result in spill-over effects through declining asset prices and increased margin calls for other market participants.¹⁰⁵

⁹⁹ FSOC (n 93).

¹⁰⁰ Office of Financial Research (n 7) 21–22.

¹⁰¹ FSB (n 1) 24; FSOC (n 93) 14.

¹⁰² Before the financial crisis, hedge funds tended to rely on one prime broker for their financing needs. Since then there has been a shift in the industry to diversifying the prime broker counterparty risk, see Frank Kenny and David Mallaburn, 'Hedge Funds and Their Prime Brokers: Developments since the Financial Crisis' [2017] Bank of England Quarterly Bulletin.

¹⁰³ John Hull, *Risk Management and Financial Institutions* (Fourth, Wiley 2015) 83.

¹⁰⁴ Kenny and Mallaburn (n 102); FSB (n 1).

¹⁰⁵ FSB (n 1) 24; FSOC (n 93) 14.

Systemic features	Long-short equity fund
Runnable/short-term funding	No
Illiquid assets	No
Leverage	Yes
Size/Correlated decisions	No
Performance fees	Yes
Principal-level risk	
Liquidity risk	++
Default risk	++
System-level risk	
Counterparty channel	++
Asset liquidation channel	++
Critical function channel	0

Table 7 Systemic dashboard long-short equity alternative investment fund

2.3. Systemic behaviour

The discussion thus far reveals that distress at the fund-level resulting in losses to counterparties of leveraged positions and price externalities are the key stability concerns associated with the asset management industry.¹⁰⁶ Besides the specific features of a fund, decisions of both investors and asset managers influence the susceptibility of funds to such systemic events.

Investors influence systemic stability through the decision to allocate capital to specific asset classes and funds. When investors herd in and out of certain investments, this can create price dynamics and market volatility. This is especially true when the investments are relatively illiquid and the investors underestimate the risks involved.¹⁰⁷ If those risks materialise due to a market shock, investors might *en masse* redeem from these investments, aggravating the shock.¹⁰⁸ The build-up and collapse of asset bubbles is not specific to investments through funds and could happen outside of the asset management industry. However, certain characteristics of the asset management business could encourage herd behaviour by investors, amplifying the impact on asset prices. For example, in the UK corporate bond fund discussed above, the structure of the fund creates a first-movers' advantage leading to possible systemic 'runs' by investors. While such behaviour is rational for each individual investor, aggregated it results in a collectively irrational outcome for all investors. Moreover, systemic runs have self-exacerbating characteristics in that the resulting irrational outcome induces further individually rational, but collectively irrational actions. Once a run starts, the remaining investors have incentives to run as well, because each redemption by an investor exacerbates the problems at the fund for the remaining investors and increases the

¹⁰⁶ FSB (n 1).

¹⁰⁷ Office of Financial Research (n 7).

¹⁰⁸ Office of Financial Research (n 7) 11–12.

likelihood that they will bear the losses. This is called the ‘recursive collective action problem’.¹⁰⁹

Asset managers, for their part, are in charge of the decision to buy and sell specific assets in order to rebalance a fund’s portfolio in response to changing market conditions. They decide on the volume and price of the assets bought and sold.¹¹⁰ Asset managers make portfolio decisions within the limits set out by the investment management agreement, the fund’s constituent documents, the fiduciary duties of the asset manager, and regulatory limits. Asset managers’ decisions can increase systemic vulnerability, for example by investing in riskier investments than normal for a particular style of fund (‘search for yield’)¹¹¹, herding into ‘popular’ assets¹¹², or bad liquidity management. Certain features of funds encourage such behaviour. In the long-short equity fund, for example, performance fees create incentives for managers to take on excessive risk. While such compensation arrangements might mitigate the agency problems resulting from the delegation of investment decisions to the asset manager, it also creates perverse incentives from a systemic perspective to increase leverage, engage in ‘momentum trading’, or more generally pursue strategies that yield short-term gains.

Idiosyncratic investment strategies of a fund are unlikely to impact prices and market volatility, unless the fund’s investments individually are sufficiently significant – relative to normal trading volume or to the total size of the market – to lead to price dynamics or market volatility in the market segment. For example, when Community Bankers – a relatively small money market fund – broke the buck in 1994, the industry did not suffer a run, as the fund had an idiosyncratic investment strategy.¹¹³

However, herding of investors and asset managers¹¹⁴ within and across funds can increase the probability that financial difficulties in certain asset classes will correlate across funds. This in turn will increase the likelihood of asset price dynamics. In other words, financial difficulties in a fund due to investment decisions can impact systemic instability in two scenarios: (a) if a fund individually can cause systemic spillovers, or (b) if the financial difficulties of the fund are correlated with financial difficulties at other funds or financial institutions more generally, which as a herd cause systemic spillovers. For example, during the financial crisis of 2008, Reserve Primary Fund broke the buck because it held securities of Lehman at the same time other MMFs had high exposure to the financial sector during a period of increasing and correlated instability in the financial sector. This resulted in a destabilising run on other MMFs.¹¹⁵ More recently, during the 2020 Covid-19 crisis, money market funds were hit by large redemption requests from investors looking for safety. The Federal Reserve, however, intervened by inserting

¹⁰⁹ Robert Hockett, ‘Recursive Collective Action Problems: The Structure of Procyclicality in Financial and Monetary Markets, Macroeconomies, and Formally Similar Contexts’ (2015) 3 *Journal of Financial Perspectives* 32.

¹¹⁰ J. Elliott (n 19).

¹¹¹ Office of Financial Research (n 7) 9.

¹¹² Office of Financial Research (n 7) 9.

¹¹³ Gordon and Gandia (n 75) 326–329.

¹¹⁴ There is a growing body of literature that documents herding behaviour in the fund sector and identifies causes for such behaviour, for an overview see Debarati Bhattacharya and Gokhan Sonaer, ‘Herding by Mutual Funds: Impact on Performance and Investors’ Response’ (2018) 24 *The European Journal of Finance* 283.

¹¹⁵ Gordon and Gandia (n 75) 326–329.

liquidity into the market by extending loans to dealers to purchase assets from money market funds, stopping the run on money market funds.¹¹⁶

3. Perverse incentives under the business model

Given the presence of systemic externalities, the final step in the analysis determines the interaction between the systemic concerns and the business model of asset managers and their funds. More specifically, this part determines whether the business or ‘principal’ benefits from the presence of these systemic features and, therefore, will actively pursue business strategies that increase systemic risk in the system. If the answer is positive, the trade-offs made by the business model will not consider the system-level risks resulting from systemic features, as these risks can be externalised to third parties.

Fund investors – like shareholders in banks – have an asymmetric option: limited liability protects against the losses suffered due to risky behaviour beyond their capital input, while profits are uncapped. As a result, the losses stemming from investments in risky/illiquid assets funded by short-term debt or from taking high leveraged positions can be partly externalised onto third parties, while profits can be enjoyed unlimited. In other words, fund investors benefit from the presence of a liquidity mismatch and leverage. To the extent that creditors of the fund expect a government bailout, they will not be encouraged to monitor the fund or negotiate contractual protection.

Moreover, with respect to the ‘size’ feature, the analysis turns on what is the ‘optimal’ size of the business of the fund. For instance, active funds face decreasing returns to scale, as the opportunities to outperform the benchmark become scarcer with increases in the industry’s size. In other words, investors of active funds have no incentives to pursue unlimited growth of the AUM. Passive funds seem to be unaffected by scale effects.¹¹⁷ As fixed costs will be lower in large passive funds, investors might be incentivised to pursue growth of the AUM.

Finally, high-powered compensation packages will – to a great extent – align the interests of investors with the interests of managers and, therefore, benefit investors. As discussed, the structure of performance fees creates an asymmetric pay-off structure for managers by giving them an uncapped share of the profits, while also guaranteeing a percentage of the AUM to cover costs. The asymmetric option of managers is even stronger than for the investors. In the good years, the managers can cash in on the entire upside of profits above the HWM. In bad times, the losses are not borne by the managers, but by the investors. Moreover, the management fees – which are a fixed percentage of the AUM – provide a floor for the losses, ensuring that the costs of the asset management business are covered.

¹¹⁶ For a detailed account, see Egemen Eren, Andreas Schrimpf and Vladyslav Sushko, ‘US Dollar Funding Markets during the Covid-19 Crisis – the Money Market Fund Turmoil’ [2020] BIS Bulletin.

¹¹⁷ Magkotsios (n 69).

Chapter IV. The systemic nature of the business model of CCPs

Chapter IV. The systemic nature of the business model of CCPs.....	73
1. The business model.....	75
1.1. The business of CCPs	75
1.2. Mandatory use of CCPs as a systemic risk measure	78
1.3. Ownership structures of CCPs.....	79
2. Systemic externalities	80
3. Perverse incentives under the business model	81
3.1. Perverse incentives in the user-owned model.....	81
3.2. Perverse incentives in the non-user-owned model.....	84
3.3. Perverse incentives in the hybrid model.....	86
3.4. Summary of the perverse incentives under the business model	87

This chapter introduces the second of our two case studies for which we are considering the first step – the ‘principal-level’ or ‘business model’ assessment – in our analysis aimed at determining the need for the regulation of corporate governance constraints to mitigate systemic risk in the financial sector. More specifically, the chapter determines whether central counterparties (‘CCPs’) generate systemic externalities, which distort the trade-offs made within the business model.

Amidst the catastrophic collapse of Lehman Brothers in September 2008, central counterparties worldwide kept the global securities and derivatives exchanges afloat by rescuing trillions of dollars of trades affected by the bankruptcy.^{1 2} A CCP or so-called ‘clearinghouse’ is a financial institution that interposes itself between the contract parties of a trade and becomes the buyer to every seller and the seller to every buyer. In doing so, the CCP takes on the counterparty risk of the transferred trades, i.e. the risk that the counterparty of the trade will not perform its side of the trade.³ The reasoning is that CCPs use better techniques to manage counterparty risk than the original counterparties. For example, CCPs organise a mutualisation mechanism as a buffer for counterparty defaults. LCH’s SwapClear, for instance, successfully managed Lehman’s \$9 trillion interest rate swap default within three weeks, without losses to other market participants.⁴

¹ For a detailed account on how CCPs intervened in the bankruptcy of Lehman Brothers, see Peter Norman, *The Risk Controllers: Central Counterparty Clearing in Globalised Financial Markets* (Wiley 2011).

² In this context, the Bank of England commented in its Financial Stability report that the market infrastructure functioned well following the default of Lehman Brothers: ‘LCH.Clearnet successfully closed out its positions without using all of the margin it had available to support the post-default process. This illustrates the ability of a clearing house to protect market participants from bilateral counterparty risk, even in the event of default of a major participant.’, see Bank of England, ‘Bank of England Financial Stability Report October 2008’ [2008] Financial Stability Report 20.

³ Jon Gregory, *Central Counterparties: Mandatory Clearing and Bilateral Margin Requirements for OTC Derivatives* (Wiley 2014) 6; Norman (n 1) 7.

⁴ LCH.Clearnet, ‘How the World’s Largest Default Was Unravelling’ [2008] Financial News <https://www.lch.com/system/files/media_root/Lehman%202008%20Financial%20News_tcm14-59521.pdf> accessed 12 October 2017.

The successful performance of CCPs during the crisis has put them on the regulatory agenda as a new financial bulwark against systemic contagion in the over-the-counter ('OTC') derivatives market.⁵ Before the crisis, CCPs were mainly used for standardised securities that are listed and traded on regulated exchanges.⁶ After the crisis, regulators worldwide put CCPs forward as the 'magic bullet' to stop financial contagion caused by the counterparty defaults in the OTC derivatives market by pushing as many OTC derivatives as possible through the CCP mechanism. By guaranteeing the OTC derivatives of a failing institution, the CCP can supposedly prevent the failure of one institution from spreading to its counterparties. In the EU, the European Market Infrastructure Regulation ('EMIR') introduces mandatory clearing via CCPs for certain standardised OTC derivatives. In the US, section 723 of the Dodd-Frank Act adopts a similar mandate.

However, the centralisation of risks also makes CCPs central nodes in the financial market, whose failure could have devastating consequences for systemic stability. In recognition of this, the US Financial Stability Oversight Council ('FSOC') has designated five central counterparties as systemically important.⁷ The EU is also in the process of adopting rules for the recovery and resolution of CCPs.⁸ It is therefore essential from a systemic risk perspective that CCPs correctly manage their risk exposure. This requires CCPs to have robust governance arrangements which ensure that CCP managers act in a manner that ensures the safeguarding of financial stability.

This lays bare the weakness of the new system: CCPs are in essence private institutions established for furthering the interests of their members, not the interests of the prudential regulator or of society more generally. Historically, CCP-type institutions were created – as a private sector initiative – to mitigate the problems of counterparty risk management experienced by commodities traders. There was no regulatory mandate for traders to submit trades to the institution nor did the institution have any obligation to accept trades.⁹ The risk governance structure of CCPs necessarily reflects these private commercial considerations rather than the artificially introduced prudential ones.

This chapter analyses the systemic effects of the business model of CCPs. More specifically, it investigates whether CCPs generate systemic externalities, which distort the trade-offs made within the business model. The analysis consists of three steps. Section IV.1 determines the 'business model' of CCPs, i.e. their strategy to generate revenue for its owners or shareholders. Section IV.2 looks for features of the CCP's business model that could pose a threat to financial stability. In other words, the chapter determines whether CCPs generate systemic externalities. Section IV.3 determines whether the pursuit of profit under the business model encourages the presence and severity of these systemic externalities.

⁵ At the G20 summit in Pittsburgh in 2009 it was stated that 'All standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest', the EU has implemented this commitment through the European Market Infrastructure Regulation ('EMIR'), in preamble (6) it is stipulated that 'The Commission will monitor and endeavour to ensure that those commitments are implemented in a similar way by the Union's international partners', see G20, 'G20 Leaders Statement: The Pittsburgh Summit' (G20 2009).

⁶ Pirrong, 'The Economics of Central Clearing Theory and Practice' [2011] ISDA Discussion Papers Series 1.
⁷ FSOC 2012.

⁸ General Secretariat of the Council, 'Proposal for a Regulation of the European Parliament and of the Council on a framework for the recovery and resolution of central counterparties and amending Regulations (EU) No 1095/2010, (EU) No 648/2012, and (EU) 2015/2365 and Directives 2002/47/EC, 2004/25/EC, 2005/56/EC, 2007/36/EC, 2011/35/EU and (EU) 2017/1132' 14540/19, 27 November 2019

⁹ For a detailed account of the history of CCPs, see Norman (n 1).

1. The business model

1.1. The business of CCPs

A CCP is a post-trade and pre-settlement market infrastructure. CCPs interpose themselves between the contract parties of a trade executed on an exchange, trading platform, or in the OTC market. Once trades are transferred to the CCP, the CCP becomes the buyer to every seller and the seller to every buyer. CCPs run a 'matched book', i.e. the position taken with the original buyer is always offset by the position taken with the original seller. The contract parties are no longer exposed to each other, but to the CCP. A core responsibility of the CCP is, therefore, to assist market participants in managing the counterparty credit risk of the transferred trades, i.e. the risk that the counterparty of the trade will not perform its side of the trade.¹⁰

In order to manage the risks involved, CCPs only allow market participants to use their services and transfer trades who meet certain membership requirements. These membership requirements aim to ensure that CCP users have sufficient resources to meet the obligations arising from participation in the CCP. Market participants who meet the CCP membership requirements are called 'clearing members' (Figure 1). Only a fraction of the participants active on the relevant markets are admitted as clearing members.¹¹

Market participants who wish to participate in the CCP, but are not clearing members, must enter into a contract with a clearing member and become a 'client' of that clearing member. In other words, the client can access the clearing services provided by the CCP by entering into a contractual relationship with an eligible clearing member. In Europe, the transaction is structured according to the 'principal to principal' model.¹² The client enters into a direct contractual relationship with the clearing member. The clearing member in turn will take on a direct contractual responsibility towards the CCP for the financial obligations arising from that client's participation.¹³ There is no direct contractual relationship between the client and the CCP.

There are different variations of such 'client clearing'. When a client and a clearing member enter into a trade ('the original contract'), the clearing member will take on both sides of the original contract in the CCP mechanism in order to transfer the trade (Figure 2). When both parties of the original contract are non-clearing members, both parties will be obliged to enter into a client clearing contract in order to transfer the original contract (Figure 3).

Clearing members tend to be the big investment and commercial banks that act as dealers in the market and earn money by charging fees – typically embedded in the price of the contracts – for matching the trades of non-clearing member market participants. For example, a commercial firm, a non-clearing member, wants to enter into an interest rate swap ('IRS') in order to swap the variable interest of a loan on its balance sheet with

¹⁰ Gregory (n 3) 6; Norman (n 1) 7.

¹¹ Norman (n 1) 8.

¹² In the US, on the other hand, client clearing is organised according to the 'agency' model, i.e. the clearing member acts as the agent for the client in the relationship with the CCP. In other words, there is a direct contractual relationship between the CCP and the client. The clearing member, however, guarantees the obligations of the client towards the CCP, see Jo Braithwaite, 'The Dilemma of Client Clearing in the OTC Derivatives Markets' (2016) 17 European Business Organization Law Review 355, 364–365.

¹³ This is called a riskless principal transaction. The 'riskless' refers to the fact that the transaction of the clearing member with the CCP is perfectly backed or 'mirrored' by the clearing member's transaction with its client.

a fixed interest rate. The firm will approach its commercial bank A, a derivatives dealer. Bank A takes the opposite side of the trade. The resulting IRS can then be transferred to a CCP under a client clearing arrangement of the type explained in Figure 2. Typically, bank A will look to hedge this exposure in the market by entering into an offsetting contract with other traders. As a result, they do not earn money by speculating on the value of the derivatives position, but by charging fees to their clients.¹⁴

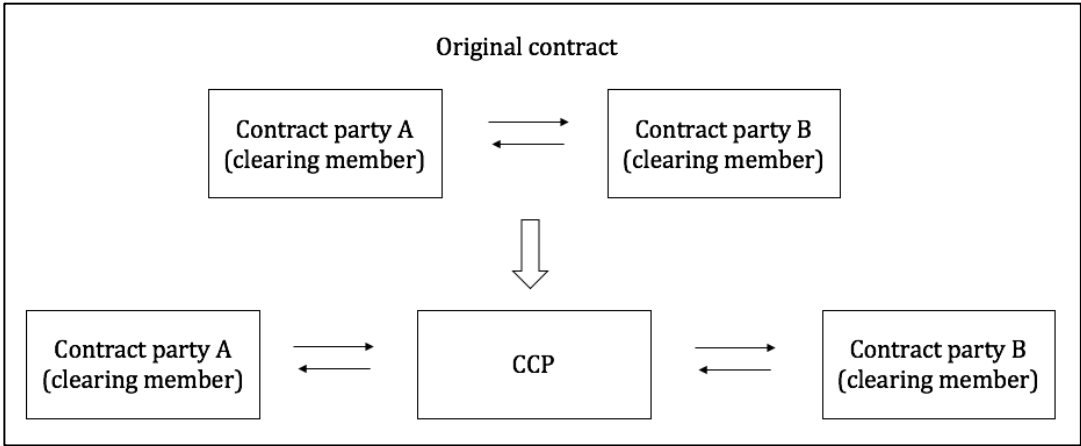


Figure 1. Central clearing

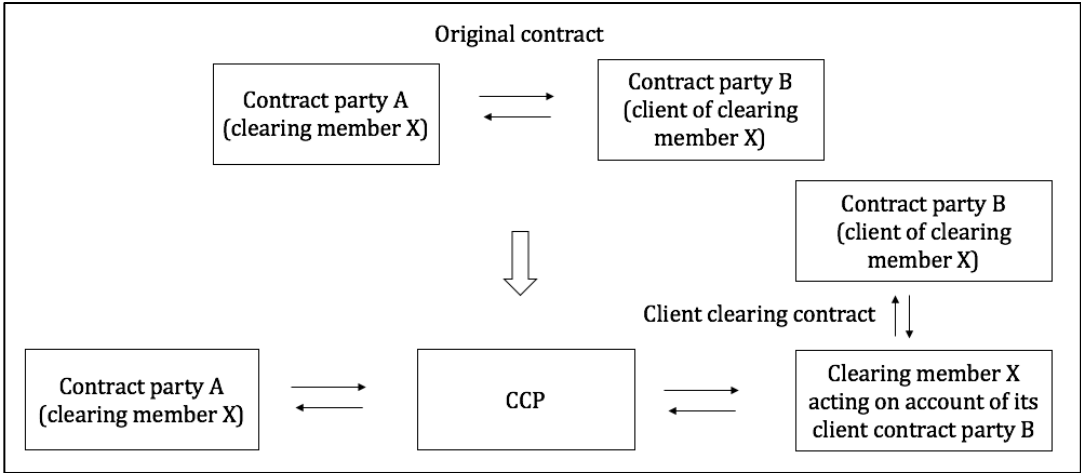


Figure 2. Client clearing with one clearing member

¹⁴ Dan Awrey, 'The Mechanisms of Derivatives Market Efficiency' (2016) 91 New York University Law Review 1104.

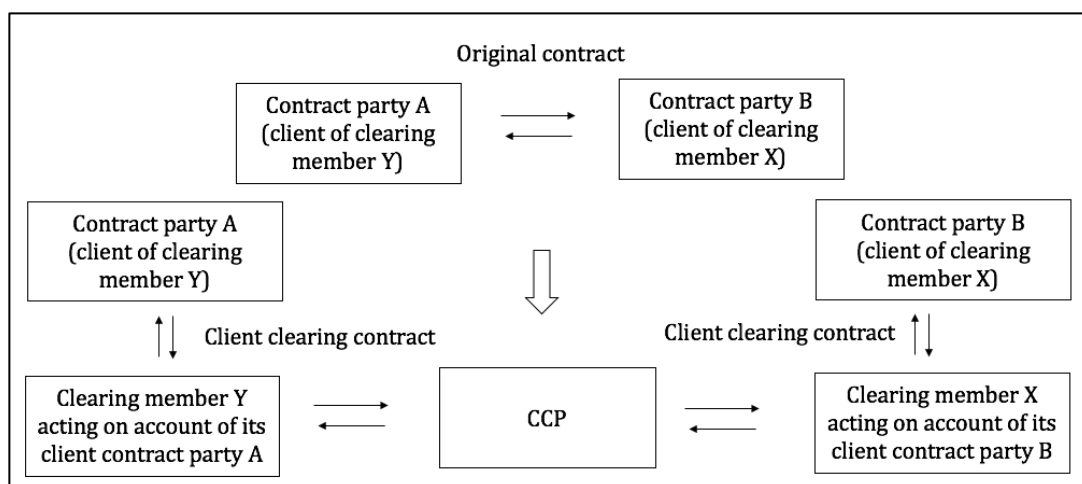


Figure 3. Client clearing with two clearing members

In the case that a clearing member defaults on its obligations to the CCP, the CCP's book is no longer perfectly matched, exposing the CCP to market risk. Over the years CCPs have developed a number of techniques and processes to restore their matched book in the event of default. The success of a CCP's default management process is largely based on its ability to transfer any outstanding positions of a defaulter. CCPs can restore the matched book by – for example – the organisation of a voluntary auction of the portfolio of the defaulted clearing members amongst the non-defaulting members.¹⁵ Other measures are full or partial contract tear-ups¹⁶ or forced allocation of contracts to non-defaulting clearing members.¹⁷

To cover the losses incurred, CCPs rely on a panoply of financial resources that will be used sequentially in the case of a default – the so-called 'default waterfall'. The default waterfall consists of a combination of margin (collateral), risk sharing mechanisms, and CCP capital. First, CCPs impose margin requirements on their clearing members, which function as the first line of support in the case of clearing member default. Each clearing member will post margin collateral to the CCP to cover the risk exposure of the CCP. Clearing members post 'initial margin' when the transaction is initiated, which covers the counterparty risk exposure at that time. At that moment, there is no market risk yet. In order to cover exposures to market risk during the life of the contract, parties will be obliged to post 'variation margin' to adjust their positions to the changes in market prices.

The surviving clearing members will also bear part of the losses via risk sharing mechanisms. These can be provided pre-default, for example through a contribution to a default fund. CCPs typically also require non-defaulting clearing members to contribute additional funds in the event of a default of another clearing member. These are called contingent 'capital calls'. In contrast to default fund contributions by clearing members, capital calls are only triggered ex-post, i.e. once a clearing member has defaulted. CCPs can also apply variation margin gains haircutting ('VMGH') to strengthen their balance sheets. VMGH releases the CCP from its obligation to post the mark-to-market variation

¹⁵ ISDA, 'CCP Default Management, Recovery and Continuity: A Proposed Recovery Framework' 3 <<https://www2.isda.org/attachment/NzE5OQ==/CCP%20Default%20Management%20recovery%20and%20continuity%2026-01-2015.pdf>> accessed 22 October 2017.

¹⁶ In the case of tear-ups, the contract parties of the cleared instruments subject to the tear-up procedures are released from their future obligations under the contract.

¹⁷ ISDA (n 15) 10.

margin gains due to the clearing members, accumulated since the clearing member default.¹⁸ Furthermore, CCPs will put part of their own capital in line to cover default losses, referred to as 'skin-in-the-game' for CCP shareholders.

The default waterfall determines the order in which these resources are consumed. Typically, CCPs first use the defaulting clearing member margin and default fund contributions.¹⁹ The CCP equity and the non-defaulting clearing members' contributions will absorb losses in excess of this.

1.2. Mandatory use of CCPs as a systemic risk measure

In the aftermath of the financial crisis, regulators have introduced the mandatory use of CCPs for certain derivatives as a way to reduce counterparty risk in the OTC derivatives market and, as a result, prevent systemic risk resulting from cascading defaults among market participants.²⁰ When a contract party defaults and cannot perform its obligation to the CCP, the CCP will still perform the obligations under its contract with the other contract party. Therefore, the transfer of the contract to a CCP insures that the default of a contract party will not affect the other contract party, as long as the CCP is creditworthy. In Europe, the mandate can be found in EMIR.²¹ In the US, the Dodd-Frank Act adopts a similar mandate.²²

The transfer of a contract to a CCP does not reduce the amount of counterparty risk in the financial system, but only re-locates it. However, the reliance on CCPs by regulators to manage the counterparty risk of certain derivatives finds its origin in the perceived benefits of the management of counterparty risk through a CCP relative to the management between counterparties bilaterally.²³

We can identify at least three benefits of the use of CCPs. First, CCPs reduce the counterparties' exposures to each other by facilitating multilateral netting²⁴, i.e. the process by which exposures between multiple parties are added up and which results in only the net exposure being paid between each clearing member and the CCP.²⁵ Multilateral netting decreases the number and size of the net exposures compared to bilateral netting.

Second, CCPs improve the absorption of losses resulting from the default of a clearing member through the default waterfall. CCPs adhere to rigid margin requirements from the clearing members to collateralise potential exposures over the life of the

¹⁸ ISDA, 'CCP Loss Allocation at the End of the Waterfall' [2013] <https://www.isda.org/a/jTDDE/ccp-loss-allocation-waterfall-0807.pdf>. Accessed 25 July 2018.

¹⁹ Pirrong (n 6) 9.

²⁰ See for example G20 Summit Pittsburgh September 2009; preamble (5) and (6) European Market Infrastructure Regulation ('EMIR').

²¹ Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories (known as 'European Market Infrastructure Regulation' or 'EMIR').

²² Section 723 Dodd-Frank Act.

²³ The European crisis report of the 'de Larosière Group' states that 'in the short-run, an important goal should be to reduce the counterparty risks that exist in the system. [...] by the creation in the EU of at least one well-capitalised central clearing house for over-the-counter credit-default swaps (CDS). [...] This is vital to realize the highly needed reduction from gross to net positions in counterparty risks [...]', see The de Larosière Group, 'The High-Level Group on Financial Supervision in the EU Report - 25 February 2009'.

²⁴ CCPs also facilitate trade compression, which is the process by which economically redundant transactions are removed from a firm's balance sheet. In the case of trade compression two or more contract parties eliminate economically redundant trades.

²⁵ Pirrong (n 6) 7.

transferred contracts. Moreover, as described above, CCPs tend to organise a co-insurance system between clearing members, where clearing members contribute funds to help absorb losses resulting from the default of another clearing member. For example, CCPs often opt for mutualisation of losses resulting from default through the establishment of a default fund through clearing member contributions.²⁶

Third, CCPs help limit price volatility when the counterparties have to replace the positions of the defaulting counterparty. This is because the CCP can organise and facilitate a more coordinated replacement process – for example through an auction – resulting in fewer disruptions. This will reduce the losses encountered by counterparties due to replacement at unfavourable prices.²⁷

1.3. Ownership structures of CCPs

Finally, this section introduces the different ownership structures of CCPs. The ownership structure will influence the incentives generated by a CCP's business model. This is because the ownership structure influences the extent to which owners are liable for the default of clearing members. We can distinguish three ownership structures: 'user-owned', 'non-user-owned', and 'hybrid' (see Figure 4).

Firstly, in some cases, clearing members own the CCP through which they clear their trades. We call this a 'user-owned CCP'. An example of a user-owned CCP is SIX-x-clear, a Swiss CCP. SIX x-clear is a subsidiary of SIX Securities Services Ltd, which in turn is a subsidiary of SIX Group Ltd, which is a Swiss unlisted public limited company owned by national and international banks. No user has a majority stake in the SIX Group.²⁸ Ownership by clearing members implies that clearing members will suffer additional losses through any erosion of the CCP's equity caused by a clearing member default.

In 'non-user-owned' CCPs, in contrast, ownership and membership are separated. For example, CCPs can be owned by central securities depositories, exchanges, and diversified shareholders in cases of listing as a public company. They are often part of a vertically integrated group for trading infrastructure (e.g. in case of exchange ownership).²⁹ For example, Eurex Clearing is a wholly owned subsidiary of Eurex Frankfurt AG, which is a wholly owned subsidiary of Deutsche Börse AG, a publicly traded exchange operator.³⁰ Another example is BME Clearing, which is owned by the BME Group, the operator of all stock markets and financial systems in Spain and publicly listed.

Some CCPs are organised according to the 'hybrid' model and have an ownership structure composed of both users and non-users. For instance, in some CCPs user-ownership is combined with ownership by exchanges or other financial institutions. For example, the London Stock Exchange owns a majority stake in LCH Group Holdings Limited, the parent of the CCP LCH Limited, while some of LCH Limited's clearing members own minority stakes in the equity of the group.

²⁶ Pirrong (n 6) 9–10.

²⁷ Pirrong (n 6) 6 and 11.

²⁸ <https://www.six-securities-services.com/en/home/clearing/about/governance.html>; <https://www.six-group.com/en/home/company/governance.html>

²⁹ Bank for International Settlements, 'Market Structure Developments in the Clearing Industry Implications for Financial Stability: Report of the Working Group on Post-Trade Services' [2010] <http://www.bis.org/publ/cpss92.pdf> 63.

³⁰ <http://www.eurexclearing.com/clearing-en/about-us/corporate-overview/organizational-structure>

Historically, most CCPs were user-owned. CCPs were owned and managed by the banks and investment houses active in the relevant market.³¹ Recently, however, there has been a trend towards reducing the user-ownership of CCPs, known as ‘demutualisation’. For example, exchanges have been keen to acquire CCPs to create vertical synergies.³² The acquisition of a majority stake in LCH by the London Stock Exchange is an illustrative example of such vertical integration. Whereas it was previously owned by a majority of clearing members, the London Stock Exchange now controls the CCP.

User-owned	Non-user-owned	Hybrid
Owned by clearing members	Owned by non-clearing members	Owned by non-clearing members and clearing members
E.g. SIX-x-clear	E.g. Eurex Clearing, BME Clearing	E.g. LCH

Figure 4. CCP ownership models

2. Systemic externalities

Although – as discussed above – a CCP can reduce systemic risk to some extent, the activities of CCPs can also have a significant impact on financial stability in the case of poor financial and operational management of the risk exposure. The systemic instability caused by the activities of CCPs could take at least three forms. First, the rigid margin requirements of CCPs can negatively affect asset prices during shocks.³³ For example, in order to meet variation margin obligations after a price shock, clearing members might have to liquidate positions to free-up cash to meet margin requirements. Depending on how large the positions are relative to the market size, these asset sales can result in illiquidity of that market and a drop of the asset prices, which can have further destabilising effects via the ‘asset liquidation’ channel.

Second, the CCP interconnects important players in the financial market through the risk mutualisation mechanism. When a clearing member defaults, the CCP might function as a contagion channel to affect other clearing members. For example, once the pre-default funds in the waterfall are exhausted, the clearing members can be asked to provide additional capital. Such capital calls can be destabilising for the other clearing members, especially when market conditions deteriorate. This can be dangerous, since the clearing members are often systemically important financial institutions.³⁴ It is, therefore, essential that CCPs carefully calibrate and manage the *pre*-default margin, default fund contributions, and their own resources to prevent capital calls *post*-default.

Third, the CCP itself might default due to liquidity and solvency problems. Such solvency and liquidity problems might lead to problems for non-defaulting clearing members, as their transactions are no longer insured by the CCP mechanism.³⁵ The CCP would become insolvent if the financial resources in the waterfall and its own equity are

³¹ Yesha Yadav, ‘The Problematic Case of Clearinghouses in Complex Markets’ (2013) 101 The Georgetown Law Journal 387, 414.

³² Yadav (n 31) 414.

³³ Pirrong (n 6) 36–37.

³⁴ David Murphy, *OTC Derivatives: Bilateral Trading and Central Clearing* (Palgrave Macmillan 2013) 151.

³⁵ Pirrong (n 6) 37.

insufficient to cover the obligations of defaulting members. But even if the CCP has enough resources, it might be unable to expeditiously liquidate the defaulter's posted assets or its own assets to cover obligations of a defaulting clearing member. Regulators increasingly recognise the importance of liquidity management in CCPs. Art. 44 EMIR requires the CCP to have adequate liquidity to perform its services and activities. The CCP must be able to cover the liquidity risk generated by the default of at least the two clearing members to which it has the largest exposure. Furthermore, on 29th of March 2015, the ECB and the Bank of England announced that they will consider providing liquidity support to CCPs if necessary. This is now formalised under the Sterling Monetary Framework ('SMF').

3. Perverse incentives under the business model

Given system-level risks, the final step in the analysis determines the interaction between the business model and systemic risk. More specifically, it determines whether the business benefits from the presence of these systemic features and, therefore, will actively pursue business strategies that increase systemic risk in the system. If the answer is positive, the trade-offs made by the business model will not consider the system-level risks resulting from systemic features, as these risks can be externalised to third parties. Hereunder, the section argues that CCPs focused on generating revenue for their owners do not have the best incentives to guide business decisions of CCPs that can have a systemic impact. As is shown in more detail below, owners in all three ownership models have perverse incentives to underinvest in ex-ante prevention of ex-post liability for clearing member default and in particular to shift loss allocation and mutualisation to the post-default stage of the waterfall. This is because in the post-default stage owners are more likely to be able to externalise the losses. This raises systemic risk concerns. Moreover, once a clearing member defaults, owners do not necessarily have the right incentives – from a systemic risk point of view – to allocate losses by using post-default mechanisms, such as capital calls and margin gains haircuts. For example, non-user-owners might have incentives to overly rely on clearing member capital calls in order to protect the CCP's capital, even if this means allocating losses to systemically important clearing members who are already experiencing distress. Hereunder, the perverse incentives in the three ownership models are discussed.

3.1. Perverse incentives in the user-owned model³⁶

In the user-owned model, the owner-clearing members suffer losses for clearing member default beyond their equity investment. Where bank shareholders enjoy limited liability, owner-clearing members will be liable beyond their equity investment for the losses caused by the default of a clearing member once the ex-ante contributions of the defaulting clearing member are exhausted. As clearing members, they will have to contribute default fund contributions ex-ante and potentially capital calls ex-post. Mechanisms such as VMGH and forced allocation of positions also allocate losses ex-post to non-defaulting clearing members. As owners, they will bear the losses through erosion of the CCP capital. As a result, the owner-clearing members bear the counterparty risk assumed by the CCP, in their joint capacity as both bearers of liability under the CCP co-

³⁶ We will consider as 'user-owned' a CCP in which all the clearing members are also owners of the CCP.

insurance and as residual owners. Put differently, owner-clearing members have significant ‘skin in the game’.

This – at first sight – gives CCPs more incentives than banks to exercise precaution, as the CCP’s owners bear more of the downside of risky behaviour. In this regard, Saguato argues in favour of organising CCPs as user-owned vehicles – against the current trend of demutualisation in the industry – in order to better align the ownership structure with prudential policy goals.³⁷ However, we argue that the incentives of owner-clearing members are not necessarily fully aligned with systemic risk concerns. This is so because owner-clearing members can externalise part of their default liability due to correlation between clearing member defaults and (implicit) government guarantees. Such systemic externalities distort the incentives to invest in ex-ante prevention of liability with significant systemic consequences. Hereunder, each component of the reasoning is discussed in more detail.

To start, the ability of owner-clearing members to externalise part of their liability for default will distort incentives to invest in ex-ante prevention of liability. In deciding how much to invest in ex-ante prevention of liability, an additional unit of ex-ante costs to prevent liability will be weighted against the marginal benefit in the amount of ex-post liability. In a user-owned CCP, owner-clearing members directly bear the ex-ante costs of prudent counterparty risk management through margin, default fund, and capital contributions. They also bear the costs of monitoring the riskiness of the CCP. They will want to reduce these risk management costs to the extent that the marginal reduction in costs is bigger than the marginal increase in expected liability for the default of another clearing member.

In CCPs this mechanism will result in underinvestment in ex-ante prevention because the owner-clearing members might be able to externalise part of the costs of ex-post liability for at least two reasons. First, the probability that clearing members will have to pay for each other’s defaults is decreased because the defaults of clearing members are correlated. Owner-clearing members will not bear the ex-post costs of the default of a clearing member when they are bankrupt themselves.³⁸ These costs will be borne by the owner-clearing member’s stakeholders.

Take the example of a user-owned CCP with three members (CM1, CM2, CM3). When entering the CCP, all three clearing members take on the liability for the default of the other two clearing members. In return, each clearing member enjoys the insurance provided by the other two members for its own default. Let’s assume that the total credit exposure of the CCP to its clearing members is divided equally among the three members. The clearing members also equally contribute to the equity of the CCP. Every clearing member has to post an equal amount of initial margin and default fund contribution based on this exposure. These are ex-ante costs that need to be made to enter into the co-insurance system and that make the use of the central clearing mechanism more expensive. All three clearing members will want to reduce these ex-ante costs for themselves.

³⁷ Paolo Saguato, ‘The Ownership of Clearinghouses: When “Skin in the Game” Is Not Enough, the Remutualization of Clearinghouses’ (2017) 34 Yale Journal on Regulation 601.

³⁸ Griffith – based on the theory of correlation-seeking developed by Squire – already signalled that large derivatives dealers might ‘intentionally undertake large amounts of contingent risk correlated to other events likely to lead to their defaults’, see Sean J Griffith, ‘Governing Systemic Risk: Towards a Governance Structure for Derivatives Clearinghouses’ (2012) 61 Emory Law Journal 1153, 1203–1204; Richard Squire, ‘Shareholder Opportunism in a World of Risky Debt’ (2010) 123 Harvard Law Review 1151.

The three clearing members do not know ex-ante which of the three will default. However, they do know that there might be a positive correlation between their respective defaults. This is especially the case when the reasons for a default are endogenous to the defaulting clearing member's industry and/or the defaulting clearing member can impact the stability of the financial system on an individual basis. Indeed, clearing members operate in the same industry, are exposed to the same risks, and could be affected by a collapse of that industry caused by the default of an important player. Furthermore, the CCP co-insurance creates an additional link between the failure of the three clearing members, which would not have been present in a bilateral context. For example, when the ex-ante provided funds prove to be insufficient to absorb the losses of the default of CM1, clearing members CM2 and CM3 can be asked to contribute additional capital through capital calls, which can have a detrimental effect on the stability of CM2 and CM3 who might already be experiencing difficult economic conditions. Ex-post contributions increase the correlation between the clearing members' defaults. Along the same lines, Armakolla and Laurent show that the probability of default of a non-defaulting clearing member is significantly higher under the assumption that two other (average) clearing members have already defaulted.³⁹

Given such correlation and given the fact that the three clearing members do not know ex-ante who will default, the three clearing members have incentives ex-ante to push their contribution to those elements of the default waterfall that are triggered after the default of a member, such as capital calls. This not only reduces the ex-ante costs, but also increases the likelihood that they will not have to pay ex-post for the default of the other two members. For example, the shareholders of CM1 and CM3 will not care about the liability for the capital calls to absorb the losses from the default of CM2, if CM1 and CM3 are also insolvent. Their shareholder value is wiped out in either case. Moreover, the capital calls can even induce the insolvency of CM1 and CM3. Such a strategy will ensure that clearing members will benefit from the CCP insurance through reduction of the cost of credit, while only having to contribute to a portion of the co-insurance mechanism. Such reasoning can be captured by the acronym 'IBG-YBG' – 'I'll be gone, You'll be gone'.

To be clear, clearing members will not want the ex-ante contributions to be reduced to zero, but will weigh an additional unit of ex-ante contributions against the marginal benefit in the amount of ex-post liability. For example, conservative margin and default fund contributions sizing can ensure that other clearing members have appropriate risk management standards in place. This reduces ex-post liability for non-systemic defaults due to internal risk management failures of other clearing members. This idea is confirmed for example by a recent call from clearing members and clients to increase the sizing of the default fund to a minimum 'Cover 2'.⁴⁰ The only claim made here is that the amount of ex-ante contributions desired by clearing members will be lower than the amount required from a systemic risk perspective.

Second, the expected costs borne by the owner-clearing members might be lower because of the possibility that the government will intervene to prevent systemic consequences. Clearing members might expect a government bail-out of the CCP in the case of a systemic failure *before* all the resources in the waterfall and the CCP capital are exhausted. The correlation of the defaults of clearing members – as discussed – increases the likelihood that the government will judge the situation serious enough to intervene.

³⁹ Angela Armakolla and Jean-Paul Laurent, 'CCP Resilience and Clearing Membership' <<https://ssrn.com/abstract=2625579>> accessed 21 October 2017.

⁴⁰ Allianz Global Investors and others, 'A Path Forward For CCP Resilience, Recovery, and Resolution' (2019) <<https://www.jpmorgan.com/jpmpdf/1320747815087.pdf>> accessed 15 November 2019.

Indeed, it is not unlikely that the government will step in to cushion the consequences of a clearing member default to prevent subsequent defaults of other clearing members. The extension of the LOLR facilities to CCPs by the central banks, discussed above, creates a similar distortion of incentives. More specifically, it reduces the incentives of the CCP to invest its financial resources in liquid assets with little exposure to market and credit risk. Unless the government (explicit or implicit) guarantee is perfectly priced through regulatory tax, the likely availability of government assistance will allow the clearing members to externalise part of the losses upon the government. In the previous example, it is likely that the government will intervene before the default of CM1 and CM3, because it fears the systemic consequences. Clearing members are often the large commercial and investment banks and failure of such institutions can result in serious disruptions in the financial market.

As a result of the above-described incentives, owner-clearing members will have suboptimal incentives to invest in ex-ante default prevention to avoid losses from clearing member default, increasing the importance of post-default mechanisms. Such strategy can have a negative impact on financial stability. First, ex-post mechanisms to absorb default losses can prove destabilising. For example, as discussed, capital calls put additional pressure on the other clearing members in distressed times. Excessive reliance on capital calls could therefore encourage the collapse of significant parts of the financial system at the same time. Moreover, prudent default management requires a careful assessment of the impact of the use of default management mechanisms – such as capital calls, VMGH and forced allocation of positions – on the system as a whole. CCPs might not necessarily have access to the necessary information to make such assessments in times of stress. In addition, given the likelihood of government assistance, CCPs have incentives to become too-big-to-fail, since it will allow them to externalise the costs of default onto the taxpayers.

3.2. Perverse incentives in the non-user-owned model

Non-user-owned CCPs have likely even worse perverse incentives than user-owned CCPs to generate systemic externalities. This is because the owners of non-user-owned CCPs are not liable beyond their initial equity investment in the case of a default and as a result, will not bear a large part of the possible systemic losses resulting from such a default. Consequently, CCPs advocating the interests of non-user-owners have incentives to reduce the costs of the clearing business in order to maximise profits and, therefore, to reduce the investment in ex-ante reduction of the probability of clearing member default with systemic consequences. Clearing members have no incentives to monitor such opportunistic behaviour of the CCP and will even encourage it, as they profit from the lower costs of the clearing business. The reasoning goes as follows.

When the owners want to maximise the profits, e.g. in the case of ownership by profit-seeking diversified shareholders, they will want to increase the volume of their trades to increase fee income. Assuming CCPs operate in a competitive market, as encouraged by the Markets in Financial Instruments Directive reforms ('MiFID II')^{41 42}, CCPs will want to lower the fees charged, because in a competitive market clearing

⁴¹ 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 Text with EEA relevance (known as 'Markets in Financial Instruments Directive' or 'MiFID II').

⁴² Among other things, MiFID II aims to improve the competition between trading and clearing platforms through mandating non-discriminatory access to trading venues and CCPs.

members will choose those CCPs in which the fees are lowest. In order to lower the costs of clearing, CCPs might be tempted to reduce the amount of margin and default fund contribution. As a result, the CCP will increase its exposure to clearing member default.

The CCP's profit-seeking owners will not bear a large part of the possible systemic losses resulting from such a default, as they benefit from limited liability. Unlike owners in user-owned CCPs, owners in non-user-owned CCPs enjoy full limited liability.⁴³ The classic shareholder moral hazard remains standing, as shareholders profit from most of the upside of risky behaviour, but are not liable beyond their initial investment in the case of a default.

This shareholder moral hazard is strengthened due to the aforementioned correlation between the defaults of the clearing members, as the correlation makes it more likely that the CCP will be bankrupt when it is called upon to pay in the co-insurance mechanism. As discussed in more detail below, EMIR, for example, requires that the default fund and the CCP's own dedicated resources should be able to withstand the default of at least their two largest members. Correlation between clearing member defaults increases the probability that two or more clearing members will default at the same time and that the resources will not be sufficient to cover the losses. For example, the CCP has to provide enough resources to cover the default of CM1 and CM2. However, the defaults of CM1, CM2, CM3 are correlated. When CM1 and CM2 default, CM3 is also more likely to default. In such scenario the CCP will not have enough resources and can default. The shareholders will not care, since, in the case of insolvency, their equity share is wiped out anyway. On the contrary, the profits from reducing ex-ante costs in the form of increased income from fees during solvent times will be higher due to correlation because the CCP is not likely to become liable under the co-insurance when the CCP is solvent. Indeed, when clearing member defaults are correlated, the scenario that one clearing member defaults is less likely to occur.

The CCP is unlikely to be heavily restricted through intervention by its contractual constituencies, as the main contractual constituencies of CCPs are the clearing members, who – as shown above – have perverse incentives to reduce ex-ante prevention of liability themselves. Clearing members in the non-user-owned model have little incentives to monitor such behaviour of the CCP in order to prevent systemic failure and, furthermore, will also want to push their liability for default towards states of the world where they are no longer solvent by reducing the ex-ante costs of the CCP co-insurance mechanism. In such a scenario they can externalise the costs on society.

In this sense, the incentives of the creditors are worse than in the bank case. Indeed, bank creditors have no incentives to monitor due to the presence of externalities, but do not actively gain from the risky behaviour themselves either. The clearing members of CCPs, on the contrary, not only do not bear a large part of the costs of systemic failures, they also actively gain from the reduction of the ex-ante costs of the clearing services they use. To the extent that clearing members are the large publicly traded commercial and investment banks that operate under the shareholder value maximisation paradigm themselves, clearing members might have strong incentives to try to increase shareholder profits through the reduction of these clearing costs.⁴⁴ Moreover, when clearing members also benefit from explicit or implicit government guarantees, their

⁴³ See also Griffith (n 38) 1209.

⁴⁴ For the OTC derivatives market, for example, the largest US-based derivatives dealers are all publicly traded companies (as of June 30, 2010: Bank of America, Citigroup, Goldman Sachs, JPMorgan Chase, and Morgan Stanley), see David Mengle, 'Concentration of OTC Derivatives among Major Dealers' [2010] ISDA Research Notes 1, 1.

creditors (e.g. their clients) will have no incentives to prevent such risky behaviour by the clearing member.

Again, such perverse incentives of both the CCP shareholders and the clearing members will impact systemic risk, much in the same way as in the case of the user-owned model. In particular, it will encourage increased reliance on ex-post mechanisms to absorb losses due to clearing member defaults, resulting in additional pressure on the non-defaulting clearing members in distressed times. This can have destabilising consequences. Moreover, post-default, non-user-owned CCPs do not necessarily have access to the necessary information to decide where losses should best be borne to ensure financial stability. In addition, non-user-owned CCPs might have incentives to overly rely on clearing member capital calls in order to protect the CCP's capital, even if this means allocating losses to systemically important clearing members who are already experiencing distress. Furthermore, CCPs have incentives to become too-big-to-fail, since it will allow their clearing members to externalise part of the ex-post liability on the taxpayers in the case of a government intervention.

The above analysis assumes that the non-user-owners have profit-maximising incentives. However, this is not necessarily the case. For example, when the non-user-owned CCP is controlled by an exchange, the exchange might not want to increase the profits at the level of the CCP, as the investment in the CCP might only be a means to improve the services provided at the level of the exchange. However, the incentives discussed above could be extrapolated. For example, an exchange is subject to the same competitive pressure to reduce the costs of trading in order to attract customers. As a result, it will also want to reduce the cost of the clearing services it provides to its customers in order to increase the competitiveness of the package of services they provide.

Moreover, it might be that a competitive market – as envisioned by MiFID II – does not fully materialise for CCPs. Indeed, CCPs operate in an environment with strong network effects. For instance, the advantages of netting of trades increases when more trades are cleared through the same CCP. Such an environment typically leads to players acquiring dominant positions in the respective niche markets. We indeed see such dynamics at play in the CCP market. CCPs tend to specialise in particular products and develop market power in that particular product market. However, the incentives of non-user-owned CCPs operating in such an environment are not necessarily aligned with prudential goals either. Initially, CCPs are likely to set low prices in order to gain market share in a new market. Once market power is acquired, weak product market competition could lead to lower risk management standards. This is especially the case when the CCP is too-big-to-fail. In a consolidated market such a status becomes increasingly likely because consolidation increases the critical function – and therefore the lack of substitutability – of a CCP.

3.3. Perverse incentives in the hybrid model

The hybrid model combines the incentives of clearing members owners and non-clearing members owners. The combination of users and non-users does not reduce perverse incentives in CCPs, as both clearing members and non-users independently have perverse incentives to reduce ex-ante liabilities for default and increase the incidence of systemic externalities. However, the hybrid model suffers from heterogeneity among owners, which adds another layer to the analysis.

By way of example, the chapter looks at the incentives within LCH, which is partly owned by its clearing members and in which the London Stock Exchange has a majority share. The ownership structure of LCH will lead to perverse incentives of the shareholders for at least three reasons. Firstly, the London Stock Exchange is publicly traded and will try to maximise its own shareholder value. Lower costs of clearing (e.g. by reducing ex-ante default contributions) will improve the competitiveness of the package of services that they can provide to their own customers, increasing their profits. Secondly, as non-users, exchanges are not liable for a default beyond their equity stake in the CCP and, therefore, will not bear a huge part of the possible systemic losses resulting from reduced investment in ex-ante prevention of default liability. Moreover, provided the loss of the equity stake in the case of CCP default is not so important to the exchange's balance sheet that it could lead to failure of the exchange itself, the creditors of the exchange will not care about such risky behaviour at the CCP level and will not monitor such behaviour. Of course, the London Stock Exchange might suffer from reputational damage, if it turned out they ultimately profited from increasing the systemic externalities generated by CCPs. Thirdly, the mix of users and non-users will result in a heterogeneity of shareholders' interests, which could lead to non-user-shareholders foisting the costs of a clearing member's default on user-shareholders. This is especially problematic when a non-user controlling shareholder is present. Such a controlling stake might allow the non-user-shareholders to abuse their position to shift costs of excessive risk-taking to minority user-shareholders. As discussed above, clearing members are often the big commercial and investment banks that are systemically relevant and are, therefore, not the ideal institutions to locate losses. This could for example be problematic – post-default – when non-user-owners CCPs might have incentives to overly rely on clearing member capital calls in order to protect their own interest. Again, these incentives can have a negative impact on systemic stability. In order to lower the costs of clearing, shareholders have incentives to reduce ex-ante default contributions, increasing the likelihood of destabilising loss allocation post-default in often distressed times. They have incentives to become too-big-to-fail, as it will allow shareholders to externalise part of the ex-post liability on the taxpayers in the case of a government intervention.

3.4. Summary of the perverse incentives under the business model

All three ownership models create perverse incentives for suboptimal investment in ex-ante default prevention. This increases the importance of post-default mechanisms, such as capital calls, VMGH or forced allocation of contracts to non-defaulting clearing members. The use of ex-post mechanisms by CCPs can have a negative impact on systemic risk for three reasons, which we find to a greater or lesser extent in all three ownership models. First, ex-post mechanisms can be destabilising. This is particularly the case when ex-post mechanisms put additional pressure on other clearing members in times of crisis. In non-user-owned CCPs and in CCPs with a hybrid ownership model with a controlling stake for non-users, there are strong incentives to use ex-post mechanisms that rely on the clearing members' capacity to absorb losses (e.g. capital calls) in order to protect the CCP's capital, even if this means allocating losses to systemically important clearing members who are already experiencing distress. Second, prudent default management requires a careful assessment of the impact of the use of default management mechanisms on the system as a whole. CCPs might not necessarily have access to the necessary information to make such assessments in times of stress. Third, given the likelihood of government assistance, CCPs under all three ownership models have

incentives to become too-big-to-fail, since it will allow them to externalise the costs of default onto the taxpayers. In sum, we find perverse incentives to generate systemic externalities under all three ownership models. These incentives are the strongest in CCPs where non-user owners have a controlling stake.

Chapter V. The current prudential framework and its limits

Chapter V. The current prudential framework and its limits	89
1. The analytical framework	91
1.1. Incomplete prudential norms.....	91
1.1.1. Public interest perspective	92
1.1.2. Public choice perspective.....	94
1.2. Prudential supervision as a gap-filler	95
1.3. The limits of prudential supervision	97
2. Incomplete norms: the case studies.....	98
2.1. Asset managers and their funds	99
2.1.1. Applicable regulation.....	99
2.1.2. The UCITS-Directive.....	102
2.1.2.1. Liquidity mismatch	103
2.1.2.2. Leverage	106
2.1.3. The AIFM-Directive	108
2.2. CCPs.....	109
3. Prudential supervision as gap-filler: the case studies	113
4. The limits of prudential supervision: the case studies	113
4.1. Supervisory competition regarding prudential requirements	114
4.1.1. The problem.....	114
4.1.2. ESMA's supervisory convergence powers.....	115
4.1.3. Governance as a complement	117
4.2. Level of residual discretion of the regulated actors	118
4.3. The locus of information.....	119

This chapter evaluates the current ‘external’ prudential framework related to the case studies discussed in the previous two chapters. In order to do so, it uses insights from both the public interest theory and the public choice theory of economic regulation. More specifically, the analysis starts from the premise that it is difficult for the lawmaker to determine – ex-ante – the exact content of the norms necessary to ensure financial stability. In addition, lawmakers face incentive problems. As a result, prudential norms are inevitably incomplete. It is argued that certain types of prudential supervision can – to some extent – fill in the gaps left by prudential norms. However, prudential supervision has its limits as well. This is where governance regulation can prove to be a useful complement to the traditional prudential framework.

Regulators worldwide heavily rely on ‘external’ prudential regulation to curb systemic risk. Indeed, the traditional approach to prudential regulation aims to control systemic risk by directly regulating the activities of financial institutions. More specifically, it constrains financial institutions in taking certain decisions (e.g.

prohibitions on banks engaging in proprietary trading) or encourages or even requires financial institutions to take certain precautionary measures (e.g. bank capital and liquidity requirements).¹ The prudential regulator can work with hard and fast rules, which describe in detail the required or prohibited behaviour, or with open-ended norms, which leave discretion to the enforcer to fill in the exact content of the norms ex-post. Such prudential norms are then operationalised through prudential supervision, which is the set of tools (e.g. data collection, on-site inspections, sector-wide reviews) regulators use to monitor the activities of financial institutions. Prudential supervision aims to ensure that financial institutions comply with the prudential norms and adequately manage the risks associated with their activities.

After the financial crisis, financial regulators worldwide adopted systemic risk mitigation as the main goal of the reform agenda. In line with the change in the systemic risk paradigm since the financial crisis, regulators have complemented regulation and supervision focused on ensuring the safety and soundness of individual financial institutions – especially for *banks* (i.e. ‘microprudential’ measures), with regulation and supervision focused on ensuring the stability of the financial system as a ‘whole’ (i.e. ‘macroprudential’ measures).

From a macroprudential perspective, regulators can take a cross-sectional or a time-series perspective on the manifestations of systemic risk. Time-series or ‘cyclical’ measures focus on the build-up of risk over time² and address the amount of risk in the system at a point in time relative to the capital and liquidity resources.³ Cross-sectional or ‘structural’ measures focus on the structural features of a financial system that make it more vulnerable to shocks, given a certain amount of time-varying risk.⁴ The measures also look to address how the interconnections between markets and institutions propagate and amplify these shocks.

Macroprudential policy is in its infancy and the exact impact and scope of the new instruments has yet to be determined. Basel III introduced changes to the Basel Committee on Banking Supervision’s traditionally microprudential framework in order to consider the stability of the financial system as a whole. For example, it introduced a counter-cyclical capital buffer, which when triggered requires banks to add capital in times of credit growth to be available in a downturn, seeking to address time-varying risk. Another example is the adoption of additional capital requirements for Global Systemically Important Banks (G-SIBs), which considers the impact of such an institution’s failure on the financial system.⁵

Moreover, macroprudential measures also expand beyond the banking industry. In the US, for example, the Financial Stability Oversight Council (FSOC) has authority to designate non-bank financial institutions as ‘systemically important’, resulting in higher prudential standards under the supervision of the Federal Reserve.⁶ Recent policy changes, however, prioritize an activities-based or industry-wide approach over

¹ Lucian A Bebchuk and Holger Spamann, ‘Regulating Bankers’ Pay’ (2009) 98 Georgetown Law Journal 247.

² John Armour and others, *Principles of Financial Regulation* (Oxford University Press 2016) 410.

³ Bank of England and Financial Services Authority, ‘Instruments of Macroprudential Policy: A Discussion Paper’

<<http://www.bankofengland.co.uk/publications/Documents/other/financialstability/discussionpaper111220.pdf>> accessed 15 May 2016.

⁴ *ibid.*

⁵ Luca Enriques, A Romano and T Wetzler, ‘Network-Sensitive Financial Regulation’ [2019] Journal of Corporation Law.

⁶ Dodd-Frank Wall Street Reform and Consumer Protection Act § 113, 15 U.S.C. § 780 (2010).

individual designation to addressing risks to U.S. financial stability.⁷ Other macroprudential tools focus on market structure. For example, regulators worldwide⁸ have introduced the mandatory use of central counterparties (CCPs) for certain derivatives in order to address contagion between financial institutions through the derivatives market.

Prudential supervision then monitors the compliance of financial institutions with the new prudential norms. Again, post-crisis, regulators worldwide have introduced macroprudential oversight in addition to traditional microprudential supervision. In the US, for example, the newly established FSOC is responsible for identifying and responding to financial stability threats in general. In the EU, the new European Systemic Risk Board (ESRB) is responsible for macroprudential oversight within the EU.

The chapter first discusses the analytical framework in general, discussing the reasons why law is incomplete, the role of the prudential supervisor as gap-filler, and the limits of prudential supervision as a solution to incompleteness. The chapter then continues by applying each aspect of the analysis to the case studies and evaluates to what extent the prudential framework in place addresses the systemic issues identified in the previous chapters. This discussion lays bare important gaps in the system of prudential regulation, which imply a role for regulation of the governance of systemically important firms in complementing the already existing prudential framework.

1. The analytical framework

1.1. Incomplete prudential norms

The analysis starts from the premise that financial markets are complex and rapidly evolving⁹, which makes it difficult for the lawmaker to determine – ex-ante – the exact content of the norms necessary to ensure financial stability.¹⁰ As a result, prudential norms are inevitably incomplete.

The analysis is inspired by the incomplete law theory, which was first articulated by Pistor and Xu.¹¹ The starting point of the incomplete law theory¹² is that law is

⁷ U. S. Treas. Dep't, Memorandum to the President on FSOC's Designation Processes for Nonbank Financial Companies and Financial Market Utilities (2017), <https://www.treasury.gov/press-center/news/Pages/Treasury-Releases-Memorandum-to-the-President-on-FSOCs-Designation.aspx>.

⁸ G20, 'G20 Leaders Statement: The Pittsburgh Summit' (G20 2009).

⁹ Dan Awrey, 'Complexity, Innovation, and the Regulation of Modern Financial Markets' (2012) 2 Harvard Business Law Review 235.

¹⁰ Acknowledging the ever-evolving nature of financial services, the EU regulation in financial services is adopted via a specific procedure, namely the 'Lamfalussy procedure', named after the Lamfalussy Report, which recommended the adoption of the procedure for financial services. The 'Lamfalussy procedure' was introduced in 2001 in order to make the regulatory process in financial services quicker and more efficient. Originally only adopted in the securities sector, the procedure was soon extended to banking, insurance, occupational pensions and asset management. The traditional legislative process in the EU was criticised for being too slow and rigid to regulate the fast-moving financial market. The adoption of Directives – the preferred instrument for harmonisation by the end of the 1980s – could take multiple years. Moreover, the need to cover both high-level principles and technical rules resulted in a lack of clarity regarding certain provisions and an excess of detail regarding others. In addition, the legislation was unresponsive to the needs and concerns of the market, see Lamfalussy Committee, 'Final Report of the Committee of Wise Men on the Regulation of European Securities Markets'; Rosa María Lastra, *International Financial and Monetary Law* (2nd edn, Oxford University Press 2015) 211 and 387.

¹¹ Although Pistor and Xu use the legal framework governing financial regulation to illustrate their theory, the conceptual framework can be used more widely to analyse 'the relation between basic features of

necessarily incomplete¹³, i.e. cannot unambiguously specify all future contingencies.¹⁴ Law can be incomplete because it does not describe all actions that could potentially lead to a harmful outcome or because its open-ended and vague norms make it difficult to determine the boundaries of its application.¹⁵ This section explores possible reasons for the incompleteness of the law both from a public interest and a public choice perspective.

1.1.1. Public interest perspective

Assuming lawmakers have the public interest at heart¹⁶, at least three sources of incompleteness exist: the cognitive or temporal constraints of lawmakers leading to incomplete coverage, changed circumstances, and deliberate design. First, lawmakers do not necessarily have the resources to write complete rules resulting in incomplete coverage. Lawmakers might lack information¹⁷ or more generally inevitably operate under cognitive¹⁸ and temporal constraints.¹⁹ Prudential norms are particularly sensitive to this source of incompleteness. More specifically, the complexity that characterises modern financial markets inevitably inhibits the capacity of prudential lawmakers to fully understand and therefore regulate the risks in the system in a

statutory and case law and the design and functioning of institutions that enforce this law', see Katharina Pistor and Chenggang Xu, 'Incomplete Law' (2003) 35 New York University Journal of International Law and Politics 931.

¹² The notion of incomplete law is inspired by the incomplete contract theory, as developed in the economics literature, see for example Oliver Hart and John Moore, 'Foundations of Incomplete Contracts' (1999) 66 Review of Economic Studies 115; Eric Maskin and Jean Tirole, 'Unforeseen Contingencies and Incomplete Contracts' (1999) 66 Review of Economic Studies 83.

¹³ It is widely accepted that law is necessarily incomplete, see HLA Hart, *The Concept of Law* (Oxford University Press 1961) 126–129; Pistor and Xu (n 11) 938–944; Cass R Sunstein, 'Problems with Rules' (1995) 83 California Law Review 953, 961.

¹⁴ For a detailed exploration of incomplete law at a conceptual level, see Pistor and Xu (n 11); Katharina Pistor and Chenggang Xu, 'Fiduciary Duty in Transitional Civil Law Jurisdictions. Lessons from the Incomplete Law Theory' in Curtis J Milhaupt (ed), *Global markets, domestic institutions: corporate law and governance in a new era of cross-border deals* (Columbia University Press 2003).

¹⁵ Pistor and Xu divide incomplete law into two types. Type I incomplete law 'broadly circumscribes outcomes without identifying particular actions, or enumerates only a few actions'. Type II incomplete law 'specifies the actions that shall be prevented but fails to capture all relevant actions', see Pistor and Xu (n 11) 941.

¹⁶ Public interest theory – which is considered a part of welfare economics – assumes that regulation aims to maximise social welfare. Although there is no canonical work articulating the theory, some representative works are James C Bonbright, *Principles of Public Utility Rates* (Columbia University Press 1961); Kenneth Culp Davis, *Administrative Law Treatise* (West Pub Co 1958); Henry J Friendly, *The Federal Administrative Agencies: The Need for Better Definition of Standards* (Harvard University Press 1962).

¹⁷ Sunstein (n 13) 957.

¹⁸ Drafters are endowed with 'bounded rationality', i.e. rationality limited by the incapacity of the economic actor to make rational decisions, even if rationality was intended, the term bounded rationality is assigned to the work of Herbert A. Simon, see Dan Awrey, 'Regulating Financial Innovation: A More Principles-Based Alternative?' (2011) 5:2 Brooklyn Journal of Corporate, Financial and Commercial Law 273, 277; Andrew Haldane, 'Speech "The Dog and the Frisbee" given at the Federal Reserve Bank of Kansas City's 36th Economic Policy Symposium on "The Changing Policy Landscape"' [2012] Bank of England Paper 1, 4; Herbert A Simon, *Models of Man: Social and Rational; Mathematical Essays on Rational Human Behavior in Society Setting*. (Wiley 1957); Oliver E Williamson, *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting* (Free Press 1985) 45–46.

¹⁹ Awrey, 'Regulating Financial Innovation' (n 18) 277; Haldane (n 18) 3.

comprehensive manner.²⁰ Systemic risk is a particularly elusive problem; there is no generally accepted definition of systemic risk nor method of measuring it.²¹

Second, changing circumstances can also render the coverage of the law incomplete. Lawmakers cannot have knowledge of all possible future circumstances in which a norm will apply. Changed circumstances – unanticipated by the lawmakers – can therefore make the law incomplete and poorly suited to attaining its objectives.²² Again, prudential norms are particularly prone to incompleteness as a result of changing circumstances. Capitalist markets are characterised by ‘radical uncertainty’²³, i.e. future states of the world we cannot assign a probability because we cannot foresee them (so-called unknown unknowns). This radical uncertainty makes it difficult for market participants to manage all uncertainties and, as a result, for regulators to regulate them ex-ante.²⁴ Systemic risk and its solutions are particularly sensitive to the ever-changing circumstances in the financial market.²⁵ Even if an exhaustive definition and method of measuring systemic risk could be identified, it would be out of date immediately.²⁶ Consequently, it is argued that regulators tend to ‘fight the past war’.²⁷

Finally, some law is incomplete by design because the lawmaker considers open-ended norms – leaving discretion to fill in the exact content of the norms ex-post – the most appropriate regulatory technique. This goes back to the traditional ‘rules versus principles’ debate.²⁸ Rules require or prohibit specific behaviour before a particular case arises, while principles²⁹ leave discretion to the enforcer – such as a court or regulator – to determine compliance with the principle by the regulated actor. In the context of financial regulation, it is argued that a detailed and complex rulebook can lead to

²⁰ Saule T Omarova, ‘License to Deal: Mandatory Approval of Complex Financial Products’ (2012) 90 Washington University Law Review 63, 65.

²¹ For example, a survey by the Office of Financial Research identifies 10 definitions of systemic risk and discusses a (non-exhaustive) list of 31 quantitative methods of measuring it, Dimitrios Bisias and others, ‘A Survey of Systemic Risk Analytics’ [2012] OFR Working Paper <http://papers.ssrn.com/sol3/Papers.cfm?abstract_id=1983602> accessed 27 October 2015.

²² Hart (n 13) 128–129; Roberta Romano, ‘Pitfalls of Systemic Risk Regulation in a World of Financial Innovation’ in Douglas W Arner and others (eds), *Systemic Risk in the Financial Sector: Ten Years After the Great Crash* (CIGI Press 2019); Sunstein (n 13) 957 and 993.

²³ Mervyn A King, *The End of Alchemy: Money, Banking and the Future of the Global Economy* (Little, Brown 2016) 9 and 143–145.

²⁴ Romano (n 22).

²⁵ As observed by Pistor and Xu, ‘Areas that are affected by a high pace of socioeconomic and/or technological change, for example, tend to be more incomplete than areas unaffected by exogenous change. The reason is that such change constantly challenges legal solutions designed to solve “old” problems and thus requires frequent adaptations of the law if it is to remain effective’, see Pistor and Xu (n 11) 932–933.

²⁶ Bisias and others (n 21) 4.

²⁷ Luca Enriques, ‘Regulators’ Response to the Current Crisis and the Upcoming Reregulation of Financial Markets: One Reluctant Regulator’s View’ (2009) 30 University of Pennsylvania Journal of International Law 1147, 1153.

²⁸ See for example Colin S Diver, ‘The Optimal Precision of Administrative Rules’ (1983) 93 The Yale Law Journal 65; Isaac Ehrlich and Richard Posner, ‘An Economic Analysis of Legal Rulemaking’ (1974) 3 The Journal of Legal Studies 257; Louis Kaplow, ‘Rules versus Standards: An Economic Analysis’ (1992) 42 Duke Law Journal 557.

²⁹ Some literature uses the term ‘standards’ instead of ‘principles’. The terms principles and standards are mostly used interchangeably, although some literature use standards more broadly to encompass both rules and principles, see Awrey, ‘Regulating Financial Innovation’ (n 18) 274–275.

homogeneity and herding in the financial market.³⁰ Such regulation can lead market participants to adopt similar strategies in order to comply with the detailed and complex rules. When such strategies turn out badly, the problems are more likely to hit widely across the financial system. Moreover, prescriptive rules could give market participants incentives to design mechanisms to avoid the application of the law.³¹ Open-ended norms can mitigate the opportunities for such regulatory arbitrage, as long as the regulator or supervisor has sufficient resources to act and complete gaps ex-post.

1.1.2. Public choice perspective

Moreover, lawmakers potentially face incentives problems and do not necessarily pursue the public interest, resulting in incomplete norms. This observation finds theoretical support in the public choice theory. Under the public choice perspective, regulators are seen as self-interested and assumed to pursue their own private objectives.³² Under this theory, the government is seen as a collection of individuals pursuing income, prestige, and power to their own benefit rather than the public interest.³³ Similarly, citizens pursue their own interests when voting in elections.³⁴ Therefore, the members of the legislative branch – as elected politicians – will aim to cater for their electorate when adopting regulation. Because each citizen individually has little incentive to find out which policy is most beneficial for its interests, elected politicians are likely to respond disproportionately to the demands of lobbyists and powerful interest groups.³⁵

Moreover, politicians that seek to deliver what voters want will focus on issues that are ‘salient’ to voters.³⁶ Prudential regulation is an example of measures that are not ordinarily salient to voters. Regulators are therefore not incentivised to use scarce regulatory resources to implement prudential regulation. Pressure to get re-elected might force lawmakers to focus on short-term goals instead of long-term stability (e.g. by focusing on credit expansion resulting in economic growth instead of on long-term financial stability).³⁷ It is only in the aftermath of a financial crisis that financial stability becomes highly salient to voters and there is political support for significant prudential reforms which oppose powerful interest groups in the interest of the public. As the

³⁰ Emiliós Avgouleas, ‘The Global Financial Crisis, Behavioural Finance and Financial Regulation: In Search of a New Orthodoxy’ (2009) 9 *Journal of Corporate Law Studies* 23; Niamh Moloney, *EU Securities and Financial Markets Regulation* (Third, Oxford University Press 2014) 945–946; Romano (n 22).

³¹ Romano (n 22).

³² A commonly used definition of the public choice theory is Dennis Mueller’s: “Public choice can be defined as the economic study of non-market decision-making, or simply the application of economics to political science. The subject matter of public choice is the same as that of political science: the theory of the state, voting rules, voter behaviour, party politics, the bureaucracy, and so on. The methodology of public choice is that of economics, however. The basic behavioral postulate of public choice, as for economics, is that man is an egoistic, rational, utility maximizer”, see Dennis C Mueller, *Public Choice II: A Revised Edition of Public Choice* (Cambridge University Press 1989) 1–2.

³³ This idea was first generalised by Anthony Downs stating that ‘each political party is a team of men who seek office solely in order to enjoy the income, prestige, and power that go with running the governing apparatus’, see Anthony Downs, ‘An Economic Theory of Political Action in a Democracy’ (1957) 65 *Journal of Political Economy* 135, 137.

³⁴ *ibid* 138.

³⁵ *ibid* 148–149.

³⁶ The phenomenon of salience was emphasised by Pepper Culpepper in relation to the regulation of M&A, see PD Culpepper, *Quiet Politics and Business Power: Corporate Control in Europe and Japan* (Cambridge University Press 2010).

³⁷ Armour and others (n 2) 554.

memory of a crisis fades from the public consciousness and the issues become less salient to voters again, lobbyist and business interests will reinsert themselves into the regulatory process. This idea is captured by the concept – first coined by Coffee – of the ‘Regulatory Sine Curve’.³⁸ Moreover, while financial stability can result in a lack of intervention by the lawmakers during good times, financial crises can force regulators to ‘do something’, independent of the quality of the intervention.³⁹

In addition, it is argued that a focus on shareholder value maximisation encourages managers to actively undermine the effectiveness of regulation through corporate political spending. Lobbying in order to obtain more business-friendly regulation could be more profitable than complying with the regulation, reducing overall welfare.⁴⁰ In this context, empirical studies suggest that corporate political spending is positively related to firm performance.⁴¹ This relationship is especially strong for firms in regulated industries⁴² and more concentrated industries⁴³. Moreover, a study by Hertig argues that the technical complexity of the OTC derivatives market increases the influence of a select group of financial markets participants, in particular large banks and major platform owners.⁴⁴

1.2. Prudential supervision as a gap-filler

As a result, while ex-ante prudential norms can begin to address the systemic issues identified in the previous chapters, an effective prudential framework needs to build in the necessary flexibility to fill in the gaps ex-post. If law were complete, all contingencies would be spelled out before cases arise and there remains no ambiguity regarding the application of the law.⁴⁵ Enforcement of complete law would merely consist of applying the rules to the relevant facts of the case. However, when law is incomplete, mere enforcement of the law will lead to suboptimal coverage. As a result,

³⁸ The concept of the ‘Regulatory Sine Curve’ refers to the idea ‘that (1) regulatory oversight is never constant but rather increases after a market crash and then wanes as, and to the extent that, society and the market return to normalcy, and (2) the public’s passion for reform is short-lived and the support it gives to political entrepreneurs who oppose powerful interest groups on behalf of the public also quickly wanes.’, see John Coffee, ‘The Political Economy of Dodd-Frank: Why Financial Reform Tends to Be Frustrated and Systemic Risk Perpetuated’ (2012) 97 Cornell Law Review 1, 1029.

³⁹ In this context, Romano argues in favour of including two procedural safeguards: ‘(1) a requirement of automatic subsequent review and reconsideration of the legislative and regulatory decisions at some future point in time; and (2) regulatory exemptive or waiver powers that encourage, where feasible, small scale experimentation, as well as flexibility in implementation’, see for more detail Roberta Romano, ‘Regulating in the Dark’ (2013) 1 Journal of Financial Perspectives.

⁴⁰ Karthik Ramanna, *Political Standards: Corporate Interest, Ideology, and Leadership in the Shaping of Accounting Rules for the Market Economy* (The University of Chicago Press 2015).

⁴¹ Hui Chen, David Parsley and Ya-Wen Yang, ‘Corporate Lobbying and Firm Performance’ (2015) 42 Journal of Business Finance & Accounting 444; Sean Lux, T Russell Crook and David J Woehr, ‘Mixing Business With Politics: A Meta-Analysis of the Antecedents and Outcomes of Corporate Political Activity’ (2010) 37 Journal of Management 223; Neil J Mitchell, Wendy L Hansen and Eric M Jepsen, ‘The Determinants of Domestic and Foreign Corporate Political Activity’ (1997) 59 J of Pol 1096.

⁴² John C Coates IV, ‘Corporate Politics, Governance, and Value Before and After Citizens United’ (2012) 9 Journal of Empirical Legal Studies 657.

⁴³ Matthew Hill and others, ‘Determinants and Effects of Corporate Lobbying’ [2013] Financial Management 931.

⁴⁴ G Hertig, ‘Post-Financial Crisis Trading and Clearing Reforms in the EU: A Story of Interest Groups with Magnified Voice’ in E Wymeersch, Klaus J Hopt and G Ferrarini (eds), *Financial regulation and supervision: a post-crisis analysis* (Oxford University Press 2012).

⁴⁵ Pistor and Xu (n 11) 938; Sunstein (n 13) 961.

incomplete law theory emphasizes the importance for legal systems to allocate the power to interpret and adapt the law when new issues arise or are identified (referred to as the 'residual lawmaking power').⁴⁶

Such residual lawmaking power can be vested in the legislator, courts, or the (private or public) regulator.⁴⁷ For example, lawmakers can leave the discretion to determine the content of the norm with the regulated actor, subject only to possible correction by the court after the harmful behaviour occurred.⁴⁸ Another technique is to set up broad principles and delegate the task of adopting more detailed rules to a regulator.⁴⁹ Regulators tend to be more flexible to adjust law over time, as they are less constrained by the often time-consuming legislative process.⁵⁰ Elected officials are often also less expert and, by definition, more politicized, than regulators.

In the context of financial regulation, it is increasingly acknowledged that supervision by the prudential regulator is a key tool to fill in the gaps left by prudential norms adopted by the legislator and, in doing so, supervision provides credibility to prudential norms.⁵¹ More specifically, supervision operationalises incomplete prudential regulation⁵² through a wide range of tools, namely teaching tools (e.g. soft law), information/surveillance-based tools (e.g. information requests, on-site inspections, sector-wide investigations), remediation tools (e.g. formal remediation plans), follow-up actions, and ex-post enforcement.⁵³

Viewing the role of supervision as a mechanism to fill in the gaps left by incomplete prudential norms has gained prominence in recent years.⁵⁴ In the US, for example, till the beginning of the nineties, the focus of prudential supervision was on ensuring compliance with prescriptive prudential norms. Banks were traditionally examined once per year, with little interaction between the firm and supervisor during the remainder of the year.⁵⁵ However, the changing environment – more specifically, the consolidation trend⁵⁶ as well as the expansion of the range of activities of banking organisations – necessitated a change in this approach to supervision.⁵⁷ Indeed, new products and markets opened opportunities for regulatory arbitrage⁵⁸, which

⁴⁶ Pistor and Xu (n 11).

⁴⁷ Hart (n 13) 130–132; Pistor and Xu (n 11) 934.

⁴⁸ Hart (n 13) 132.

⁴⁹ *ibid* 131.

⁵⁰ Pistor and Xu (n 11) 1012.

⁵¹ For example, 'While it is clearly vital that the rules of doing business in a regulated industry are framed in such a way to ensure the appropriate regulatory outcomes, without effective supervision and enforcement, the rules will ultimately lack credibility. Indeed, it is only through the exercise of supervision that regulators are able to gather the information needed to make regulatory judgements, and appropriate powers of enforcement are also needed for them to be able to make firms act on these judgements. For this reason, the Government will ensure that each authority has its own credible and effective supervisory and enforcement powers.', see HM Treasury, 'A New Approach to Financial Regulation: Judgment, Focus and Stability' (2010) 28.

⁵² Donald C Langevoort, 'The Social Construction of Sarbanes-Oxley' (2007) 105 *Michigan Law Review* 1817.

⁵³ Niamh Moloney, *The Age of ESMA : Governing EU Financial Markets* (Hart Publishing 2018) 179.

⁵⁴ Eric J Pan, 'Understanding Financial Regulation' [2012] *Utah L. Rev.* 1897, 1911.

⁵⁵ Lisa Deferrari and David Palmer, 'Supervision of Large Complex Banking Organizations' (2001) 87 *Federal Reserve Bulletin* 47, 47.

⁵⁶ That is the trend in the US banking system since the end of the 80ties towards consolidation of assets in a few large companies, see Deferrari and Palmer (n 55).

⁵⁷ *ibid* 49.

⁵⁸ For example, securitisation and other innovations have provided banks with opportunities to reduce its regulatory capital without reduction of their overall economic risk, see David Jones, 'Emerging Problems

supervision focused on technical compliance with the inevitably incomplete prudential norms did not catch.⁵⁹ Moreover, supervisors lacked the financial and human resources to monitor the increasingly large and complex financial institutions, especially given the speed with which the risk profiles of these institutions changed.⁶⁰ Innovations could result in financial institutions posing a threat to the financial system in a very short period of time, which periodic supervision would not be able to identify in time.⁶¹

Other countries followed a similar trend and many supervisors moved towards a more risk-based rather than compliance-based approach to supervision.⁶² In a risk-based⁶³ framework the supervisor focuses on those issues which pose the greatest risk to the achievement of the regulatory objectives – i.e. financial stability – rather than on compliance with specific norms.⁶⁴ As a result, the supervisory staff is granted with substantial discretion, for example regarding what information to collect, the evaluation of the financial institution's risk management and assessment of the quality of its assets.⁶⁵ Risk-based supervision relies on continuous contact and conversation between supervisors and the supervised entity in order to address the identified issues and achieve the regulatory objectives.⁶⁶ Such risk-based supervision can help gain traction to address the incompleteness of ex-ante norms. More specifically, the continuous and iterative nature of risk-based supervision provides supervisors – in theory – with the flexibility to timely respond to new issues and leverage the experience and knowledge of the regulated actors to do so. It needs noting that, spurred in part by the financial crisis, there has been a trend toward limiting – to some extent – the discretion of the prudential authorities within the supervisory process.⁶⁷

1.3. The limits of prudential supervision

However, the allocation of the residual lawmaking power to the prudential supervisor has its limits. These limits find their origin both in the inherent difficulty of correctly performing the prudential tasks and in the distorted incentives of prudential authorities. In other words, the evaluation of the limits of prudential supervision need

with the Basel Capital Accord: Regulatory Capital Arbitrage and Related Issues' (2000) 24 Journal of Banking & Finance 35.

⁵⁹ Armour and others (n 2) 580.

⁶⁰ *ibid.*

⁶¹ Pan (n 54) 1911.

⁶² By the nineties, the Federal Reserve implemented a 'risk-based' approach to banking supervision. Similarly, by the end of the nineties, the then newly-established UK Financial Services Authority also committed to a risk-based approach to supervision. A similar trend can be identified in other countries, see Julia Black, 'The Development of Risk Based Regulation in Financial Services: Canada, the UK and Australia' [2004] ESRC Centre for the Analysis of Risk and Regulation; Deferrari and Palmer (n 55).

⁶³ In this context, the term 'risk-based' refers to the risk that the supervisor will not attain its objectives. However, 'risk-based' regulation is used in a variety of contexts and can refer to different regulatory strategies, for a discussion of the different meanings, see Julia Black, 'Managing Regulatory Risks and Defining the Parameters of Blame: A Focus on the Australian Prudential Regulation Authority' (2006) 28 Law & Policy 1, 3–4.

⁶⁴ Julia Black, 'Risk-Based Regulation: Choices, Practices and Lessons Being Learnt', *Risk and Regulatory Policy: Improving the Governance of Risk* (OECD Publishing 2010) 186.

⁶⁵ Armour and others (n 2) 581; Pan (n 54).

⁶⁶ Pan (n 54) 1912.

⁶⁷ An example in this context is the introduction of CAMELS, i.e. a rating system used by prudential authorities to rate banks based on six factors, namely capital adequacy, asset quality, management, earnings, liquidity, and sensitivity.

to consider the two main perspectives on economic regulation: the ‘public interest theory’ and the ‘public choice theory’.

First, under the assumption that prudential regulators pursue the public interest, Pistor and Xu identify two important factors to determine the optimal allocation of lawmaking powers to regulators: standardisation and the level of the expected harm from misconduct. Standardisation refers to the idea that the effectiveness of the gap-filling role of prudential supervisors relies on the ability of regulators to identify and standardise which actions and outcomes may reasonably be expected to generate harmful outcomes.⁶⁸ This requires that the prudential authorities have the necessary resources – such as access to information – to make such judgements. The level of expected harm, moreover, refers to the idea that ‘if [...] the level of expected harm is substantial [...] court enforcement will not be effective. It will typically come too late, after harm has been done.’⁶⁹

Second, under a public choice perspective, the incentives of prudential supervisors – as ‘un-elected officials’ – are also considered tainted and influenced by factors other than the pursuit of the public interest.⁷⁰ For example, un-elected officials might experience pressure from elected officials, for instance because the official is appointed by elected officials. Prudential authorities might also be motivated by a desire to increase the power, prestige, and budget of their agency, even if this does not necessarily further public interest.⁷¹ Moreover, personal career objectives of the personnel of the prudential authorities can influence the behavior of un-elected officials away from the public interest. For example, the prospect of ‘revolving doors’ – i.e. the movement of personnel between the government and the private sector – might induce government officials to be disproportionately sensitive to the interests of private actors that are able to provide them with interesting career options in the future.⁷²

2. Incomplete norms: the case studies

This section looks into the level of incompleteness of the prudential norms governing our two case studies. It argues that, although the regulatory landscape has broadened significantly since the crisis, the prudential norms under EU law are incomplete and do not ex-ante solve the issues identified in previous chapters. Indeed, the applicable norms do not comprehensively describe all actions that could potentially impact financial stability. Moreover, where the norms are open-ended, there exist significant boundary issues with respect to the application of the norms. The section evaluates the prudential norms governing the case studies. The section first discusses asset managers and their funds, before discussing central counterparties.

⁶⁸ Pistor and Xu (n 11) 952.

⁶⁹ *ibid* 954.

⁷⁰ For an overview of financial supervisors’ incentives, see Luca Enriques and Gerard Hertig, ‘Improving the Governance of Financial Supervisors’ (2011) 12 *European Business Organization Law Review* 357, 361–365.

⁷¹ William A Niskanen, *Bureaucracy and Representative Government* (Aldine, Atherton 1971).

⁷² Mathias Dewatripont, Ian Jewitt and Jean Tirole, ‘The Economics of Career Concerns, Part I: Comparing Information Structures’ (1999) 66 *The Review of Economic Studies* 183; Donald Langevoort, ‘The SEC as a Lawmaker: Choices about Investor Protection in the Face of Uncertainty’ (2006) 84 *Washington University Law Review* 1603–1606.

2.1. Asset managers and their funds

2.1.1. Applicable regulation

In the aftermath of the financial crisis, the EU has strengthened the regulatory framework applicable to asset managers and their funds. More specifically, asset managers and their funds are regulated through the revised UCITS-Directive and the AIFM-Directive. Financial stability was an important driver in the adoption of both the revised UCITS-Directive⁷³ and the new AIFM-Directive.⁷⁴

The UCITS-Directive regulates undertakings for collective investment in transferable securities ('UCITS') established within the EU member states. UCITS means an undertaking (a) *'with the sole object of collective investment in transferable securities or in other liquid financial assets [... as defined by the UCITS-Directive...]' of capital raised from the public and which operate on the principal of risk-spreading, and (b) with units which are, at the request of holders, repurchased or redeemed, directly or indirectly, out of those undertakings' assets*.⁷⁵ The following funds fall outside the scope of the directive: closed-ended funds, funds that do not raise capital from the public within the Community, and categories of funds prescribed by the regulations of the member states where the rules regarding the investment policies for UCITS are considered inappropriate.⁷⁶ The UCITS-Directive establishes a common framework for the authorisation, supervision, structure and activities of UCITS and their management companies.⁷⁷

Before the implementation of the AIFM-Directive, the regulation of non-UCITS collective investment vehicles was left to the member states, resulting in a wide variety of national regulatory regimes. The adoption⁷⁸ of the AIFM-Directive created a

⁷³ Preamble (8) UCITS- Directive. The UCITS-Directive went through multiple versions and the latest version is UCITS V.

⁷⁴ Commission, 'Proposal for a Directive of the European Parliament and of the Council on Alternative Investment Fund Managers and amending Directives 2004/39/EC and 2009/.../EC' (Explanatory Memorandum) COM(2009) 207 final, 2-3.

⁷⁵ Article 1 (2) UCITS-Directive.

⁷⁶ Article 3 UCITS-Directive.

⁷⁷ The origin of UCITS-Directive lies in the desire to create a single market with respect to the participation in collective investment schemes. Since its adoption in 1985, the regime has gone through a series of reforms in order to address market inefficiencies, increase investor protection, and reduce systemic risk. For a detailed overview of the evolution of the UCITS regime see Moloney, *EU Securities and Financial Markets Regulation* (n 30) 204–215.

⁷⁸ In contrast to the UCITS-Directive – which evolved out of a desire to establish a single market, the AIFM-Directive finds its origin in the regulatory response after the financial crisis and has a strong financial stability focus. The AIFM-Directive aims to address the risks that many AIF strategies are thought to pose to investors, other market participants, and markets. The explanatory memorandum to the final proposal of the AIFM-Directive identifies six different risks that warrant the regulator's attention: macro-prudential risk, micro-prudential risk, investor protection, market efficiency and integrity, impact on market of corporate control, and impact of companies controlled by AIFM. The Commission highlights the sources of each type of risk. Relevant for the purpose of this thesis, the Commission highlights the prudential risks related to the *'direct exposure of systemically important banks to the AIFM sector'*, the *'pro-cyclical impact of herding and risk concentrations in particular market segments and deleveraging on the liquidity and stability of financial markets'*, and *'weakness in internal risk management systems with respect to market risk, counterparty risks, funding liquidity risks and operational risks'*. Moreover, regarding investor protection, the Commission draws attention to the risks originating from the *'conflicts of interest and failures in fund governance, in particular with respect to remuneration, valuation and administration'*, see Commission, 'Proposal for a Directive of the European Parliament and

harmonised regime for the management of alternative investment funds ('AIFs') as well as the marketing of units/shares in those AIFs to professional investors. The Directive defines AIFs as '*collective investment undertakings, including investment compartments thereof, which: (i) raise capital from a number of investors, with a view to investing it in accordance with a defined investment policy for the benefit of those investors; and (ii) do not require authorisation pursuant to Article 5 of [...] [the UCITS-Directive]*'.⁷⁹ This broad definition brings all non-UCITS investment funds within the scope of the AIFM-Directive.⁸⁰

The AIFM-Directive is applicable to the managers of alternative investment funds ('AIFMs'), who manage and/or market alternative investment funds ('AIF'). AIFMs are '*legal persons whose regular business is managing one or more AIFs*'. A legal person manages a fund when it performs the management functions of portfolio management and risk management.⁸¹ ⁸² An AIF can manage itself internally or appoint an external management company. In the former case, the fund's governing body or equivalent internal mechanism performs the management functions. In the latter case, an external legal person is responsible for managing the fund.⁸³

The AIFM-Directive regulates the asset management industry at the level of the manager of the fund rather than at the level of the fund itself. In the case of an external manager, the AIF's operations will therefore only be indirectly affected by the AIFM-Directive. It is the external AIFM's responsibility to ensure the AIFs under their management comply with the rules set out in the AIFMD. In the case of a non-compliant AIF, the external manager might be required to resign as AIFM of the AIF.⁸⁴

Moreover, AIFMs that meet the *de minimis* conditions⁸⁵ can operate under a 'light' regime.⁸⁶ The light regime seeks to ensure that regulators can monitor the risks small AIFs pose as a herd. Under the *de minimis* regime AIFMs must register with the competent authorities of their home member state and provide them with the necessary information (e.g. regarding their investment strategies and the main instruments in which they are trading).⁸⁷

of the Council on Alternative Investment Fund Managers and amending Directives 2004/39/EC and 2009/.../EC' (Explanatory Memorandum) COM(2009) 207 final, 2-3.

⁷⁹ Article 4 (a) AIFM-Directive.

⁸⁰ See also preamble (3) AIFM-Directive.

⁸¹ Article 4 (w) and Annex I (1) AIFM-Directive.

⁸² An AIFM does not need an authorisation under the Directive unless it performs both functions (article 6 (5) (d) AIFM-Directive). On the other hand, it is not necessary for the AIFM to perform an administrative function or marketing function. This is in contrast to the UCITS-Directive (annex II UCITS-Directive).

⁸³ Preamble (20) AIFM-Directive.

⁸⁴ Article 5 (3) AIFM-D.

⁸⁵ Article 3 (2) subjects the following AIFMs to the light regime: 'AIFMs which either directly or indirectly, through a company with which the AIFM is linked by common management or control, or by a substantive direct or indirect holding, manage portfolios of AIFs whose assets under management, including any assets acquired through use of leverage, in total do not exceed a threshold of EUR 100 million; or (b) AIFMs which either directly or indirectly, through a company with which the AIFM is linked by common management or control, or by a substantive direct or indirect holding, manage portfolios of AIFs whose assets under management in total do not exceed a threshold of EUR 500 million when the portfolios of AIFs consist of AIFs that are unleveraged and have no redemption rights exercisable during a period of 5 years following the date of initial investment in each AIF.'

⁸⁶ The AIFMs under this regime cannot benefit from the passporting or other rights under the AIFM-Directive unless they opt in to the full regime (article 3 (4) AIFM-Directive).

⁸⁷ Article 3 (3) AIFM-Directive.

The AIFM-Directive is amplified by a dense body of administrative rules. Most importantly, the Commission adopted a Commission Delegated Regulation, with more detail on exemptions, general operating conditions, depositaries, leverage, transparency and supervision.⁸⁸ The European Securities and Markets Authority ('ESMA')⁸⁹ plays an important role in the development of the rulebook and has issued guidelines and recommendations on a variety of issues.⁹⁰

In chapter three we concluded that two out of our three stylised examples may give rise to systemic concerns, namely our UK corporate bond index fund and our long-short equity fund. A UK corporate bond fund is likely organised and regulated as a UCITS.⁹¹ A long-short fund, on the other hand, engages in an alternative investment strategy, which at one time would have prevented the use of a UCITS structure. However, since the UCITS III and UCITS IV reforms, UCITS can pursue – under certain conditions – a variety of alternative investment strategies, including long-short strategies.⁹² The possibilities are however more restricted under the UCITS regime. For example, a UCITS is not allowed to take direct uncovered short positions. It can, however, under certain limits use derivatives to synthetically create short exposure, as discussed below. Moreover, UCITS must ordinarily allow for at least fortnightly redemption of the units by the unitholder. The competent authorities may, however, permit a UCITS to reduce the frequency to once a month as long as such derogation does

⁸⁸ Commission Delegated Regulation (EU) 231/2013 of 19 December 2012 supplementing Directive 2011/61/EU of the European Parliament and of the Council with regard to exemptions, general operating conditions, depositaries, leverage, transparency and supervision [2012] OJ L 83/1 ('2013 Commission Delegated Regulation AIFM-Directive')

⁸⁹ ESMA is one of the three European supervisory authorities ('ESAs'). The other two ESAs are the European Banking Authority ('EBA') and the European Insurance and Occupational Pensions Authority ('EIOPA'). Amongst other things, the ESAs are tasked with developing guidelines, recommendations, and draft regulatory and implementing technical standards in order to support the lawmaking process in the EU (article 8 EBA Regulation, article 8 EIOPA Regulation, and article 8 ESMA Regulation.). Firstly, the ESAs develop draft regulatory and technical standards in their respective areas of expertise. The regulatory standards are submitted by the ESAs to assist the Commission in the context of the delegation of power by the European Parliament and the Council to the Commission pursuant to article 290 TFEU (Article 10 EBA Regulation, article 10 EIOPA Regulation, and article 10 ESMA Regulation). Moreover, the ESAs are also tasked with drafting implementing technical standards referred to in article 291 TFEU, which shall then be submitted to the Commission for endorsement (article 15 EBA Regulation, article 15 EIOPA Regulation, and article 15 ESMA Regulation). The guidelines and recommendations, furthermore, are non-binding measures that aim to establish 'consistent, efficient and effective supervisory practices within the ESFS, and to [...] ensure [...] the common, uniform and consistent application of Union law' (Article 16 [1] EBA Regulation, article 16 [1] EIOPA Regulation, and article 16 [1] ESMA Regulation.). The ESAs can address the recommendations and guidelines both to competent authorities or financial institutions (article 16 [1] EBA Regulation, article 16 [1] EIOPA Regulation, and article 16 [1] ESMA Regulation). In the case addressed to the former, the competent authorities are obliged to confirm whether they will conform with the guidelines and recommendations, and if not, state the reasons for the non-compliance (article 16 [3] EBA Regulation, article 16 [3] EIOPA Regulation, and article 16 [3] ESMA Regulation.). The guidelines and recommendations cover areas that are not covered by the regulatory or implementing standards, see Commission, 'Public Consultation on the Operations of the European Supervisory Authorities, Brussels, 21 March 2017 (Consultation Paper)' 8.

⁹⁰ For a detailed discussion of the interaction between ESMA and the European Commission Moloney, *EU Securities and Financial Markets Regulation* (n 30) 286.

⁹¹ See for example the UK Investment Grade Bond Index Fund by the Vanguard Group, <https://www.vanguard.co.uk/adviser/adv/detail/mf/overview?portId=9135&assetCode=BOND##overview>.

⁹² See for example BlackRock's Global Long Short Equity Fund, <https://www.blackrock.com/uk/intermediaries/products/279522/?switchLocale=y&siteEntryPassthrough=true>.

not prejudice the interests of the unitholders.⁹³ In sum, depending on the specifics of the long-short fund, the fund can be organised as a UCITS or an AIF. In our stylised example, the restricted redemption terms would prevent the use of the UCITS structure.

2.1.2. The UCITS-Directive

The UCITS-Directive regulates both the UCITS fund and its manager. At the level of the management companies, the UCITS-Directive requires the management company to acquire authorisation – prior to managing a UCITS – by the competent authorities of its home member state.⁹⁴ The Directive imposes conditions for authorisation on the management company⁹⁵ as well as detailed operating rules.⁹⁶ The UCITS itself also needs authorisation before pursuing its activities.^{97 98} Important for our purposes, is that – once authorised – UCITS need to adhere to a strict investment policies regime, diversification rules, risk management requirements, and general obligations of UCITS. The section below discusses how the UCITS-regime addresses the two key systemic vulnerabilities associated with investment funds, as identified in chapter three. More

⁹³ Article 76 UCITS-Directive.

⁹⁴ Article 6 UCITS-Directive.

⁹⁵ For example regarding its core activities (article 6 UCITS-Directive), its capital (article 7(a) UCITS-Directive), the reputation and expertise of the persons who effectively conduct the business of the management company ('fit and proper') (article 7(b) UCITS-Directive), and the identity of the shareholders and members that have qualifying holdings (article 8 UCITS-Directive; article 2 (j) UCITS-Directive defines qualifying holding as 'a direct or indirect holding in a management company which represents 10 % or more of the capital or of the voting rights or which makes it possible to exercise a significant influence over the management of the management company in which that holding subsists'). Regarding the latter, the competent authority can refuse authorisation – considering the sound and prudent management of the management company – if they do not consider the shareholders with qualifying holdings 'suitable' (Article 8 UCITS-Directive.).

⁹⁶ More specifically, managers need to continuously comply with the original authorisation requirements (article 10 (1) UCITS-Directive), follow a notification procedure with respect to qualifying holdings in management companies (article 11 UCITS-Directive), and adhere to the prudential rules referred to in article 12 UCITS-Directive (article 11 UCITS-Directive). The latter rules aim to ensure that an appropriate set-up is in place to tackle conflicts of interests harming clients' or UCITS' interests. The UCITS-Directive regulates the delegation of functions by the management company to third parties (article 13 UCITS-Directive) as well as rules of conduct for the management companies (article 14 UCITS-Directive). The conduct rules require that a management company acts honestly and fairly in the best interests of the UCITS and the integrity of the market; acts with due skill, care and diligence, in the best interests of the UCITS it manages and the integrity of the market; has and employs effectively the resources and procedures; tries to avoid and, if necessary, fairly manages conflicts of interests; and complies with all regulatory requirements applicable to the conduct of its business activities so as to promote the best interests of its investors and the integrity of the market (article 14 UCITS-Directive). The Commission adopted an implementing Directive with detailed rules regarding organisational requirements, conflicts of interest, conduct of business, risk management and the content of the agreement between a depositary and a management company (Commission Directive 2010/43/EU of 1 July 2010 implementing Directive 2009/65/EC of the European Parliament and of the Council as regards organisational requirements, conflicts of interest, conduct of business, risk management and content of the agreement between a depositary and a management company [2010] OJ L 176/42.) The 2014 UCITS V reforms introduced an overarching obligation of the management company to act honestly, fairly, professionally, independently and solely in the interest of the UCITS and its investors (article 25 (2) UCITS-Directive). The 2014 UCITS V reforms also introduced operating rules regarding remuneration policies and practices (article 14a and 14b UCITS-Directive)

⁹⁷ Article 5 UCITS-Directive.

⁹⁸ In order to receive authorisation, UCITS must satisfy the conditions set out in the UCITS-Directive, such as regarding initial capital, the reputation and expertise of the directors of the investment company, and close links (article 29 UCITS-Directive).

specifically, first it discusses the provisions relevant to the risks related to the possible liquidity mismatch between a fund's investments and the redemption rights of its investors. Second, it describes the provisions related to the use of leverage by funds.

2.1.2.1. Liquidity mismatch

Under the UCITS regime, UCITS must redeem their units at the request of a unitholder.⁹⁹ UCITS should – as a general rule – allow for at least fortnightly redemption of the units by the unitholder.¹⁰⁰ The UCITS-Directive foresees two qualifications to the general obligation regarding redemption. First, UCITS can temporarily suspend redemption in exceptional cases and where necessary to safeguard the interests of the unitholders, in accordance with applicable national law, the fund rules or the instruments of incorporation of the investment company. Second, a UCITS' home Member State can allow the competent national authorities to require the suspension of redemption in the interest of the unitholders or of the public.¹⁰¹

UCITS can present systemic risk when the liquidity of their investments does not match the redemption terms. The difficulty in regulating the liquidity of the investments is that financial innovation entails that new investment products can constantly challenge the boundaries of the law. Moreover, the liquidity of an asset may vary in time. For example, during the liquidity crisis following the bankruptcy of Lehman Brothers, assets that – generally speaking – were considered highly liquid turned out to be completely illiquid in the months following the bankruptcy.¹⁰² ¹⁰³ As a result, continuous liquidity management will be necessary.

Under the UCITS investment policy regime, as a general rule, UCITS can only invest in liquid assets. The first UCITS-Directive of 1985 limited the eligible assets to listed shares and bonds. The list of eligible instruments expanded since then to include a variety of financial instruments. More specifically, UCITS are allowed to invest in 'transferable securities' and other 'liquid financial instruments' as referred to in article 50 (1) UCITS-Directive.¹⁰⁴ By limiting the investments of UCITS to presumably liquid investments, UCITS should be in the position to fulfil redemption requests without liquidity issues.

A broad range of assets are eligible as investment for UCITS under article 50 (1) UCITS-Directive. It covers transferable securities and money market instruments admitted to or dealt in on a regulated market as specified under the UCITS-Directive.¹⁰⁵ Recently issued securities are also included, subject to conditions regarding the issue's admission to listing.¹⁰⁶ Moreover, UCITS can also invest – under specific conditions – in

⁹⁹ Article 84 (1) UCITS-Directive.

¹⁰⁰ Article 76 UCITS-Directive.

¹⁰¹ Article 84 (2) UCITS-Directive.

¹⁰² Aldo Soprano, *Liquidity Management : A Funding Risk Handbook* (Wiley 2015) 5.

¹⁰³ The Brunnermeier and Pederson model shows that under certain conditions liquidity can suddenly dry up. This is because when speculator's capital is abundant, the market must be in a liquid equilibrium: liquid markets lead to favourable funding conditions for speculators, which in turn make the market liquid. If speculator's capital is reduced to a critical point, the liquidity in the market will switch to a low liquidity equilibrium: illiquid markets result in unfavourable funding conditions, which will prevent speculators from making the market liquid, see Markus K Brunnermeier and Lasse Heje Pedersen, 'Market Liquidity and Funding Liquidity' (2009) 22 Review of Financial Studies 2201.

¹⁰⁴ Article 1 (2) (a) UCITS-Directive.

¹⁰⁵ Article 50 (1)(a)-(c) UCITS-Directive.

¹⁰⁶ Article 50 (1)(d) UCITS-Directive.

units of UCITS or equivalent collective investment undertakings¹⁰⁷, bank deposits¹⁰⁸, and financial derivatives¹⁰⁹. Under certain conditions, UCITS can also invest in securitised positions.¹¹⁰

In order to avoid uncertainty regarding whether certain financial instruments – developed since the adoption of the UCITS regime – fall within the scope of the definitions provided by the UCITS-Directive, the Commission adopted a Commission Directive on the clarification of certain definitions.^{111 112} The Commission Directive¹¹³ does not establish an exhaustive list of financial instruments rather it identifies basic criteria that can be used in assessing whether a financial instrument falls within the scope of an eligible asset as defined by the UCITS-Directive.¹¹⁴ In other words, the Commission uses open-ended norms in order to be able to capture new financial instruments created after the adoption of its Directive. This presents significant boundary issues regarding what assets should be eligible to ensure financial stability.

Take the example of ‘transferable securities’. ‘Transferable securities’ are defined as ‘(i) shares in companies and other securities equivalent to shares in companies (shares); (ii) bonds and other forms of securitised debt (debt securities); (iii) any other negotiable securities which carry the right to acquire any such transferable securities by subscription or exchange’.¹¹⁵ The Commission Directive identifies a range of criteria in order to assess whether an asset qualifies as a ‘transferable security’ under the UCITS-Directive. The criteria concern characteristics such as liquidity, reliable valuation, availability of information, negotiability, and risk.¹¹⁶

The definition can cover a wide range of instruments with varying risk profiles which are not necessarily appropriate for the UCITS structure. For example, the search for yield in the current low interest rate environment, has led some UCITS to invest in less liquid assets, for example unlisted securities, private credit, and corporate bonds. This trend was acknowledged by the Chair of ESMA, Steven Maijor, in his keynote

¹⁰⁷ Article 50 (1)(e) UCITS-Directive.

¹⁰⁸ Article 50(1)(f) UCITS-Directive.

¹⁰⁹ Article 50(1)(g) UCITS-Directive.

¹¹⁰ Article 50 (a) UCITS-Directive.

¹¹¹ Preamble (2), (3), and (4) Commission Directive 2007/16/EC of 19 March 2007 implementing Council Directive 85/611/EEC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards the clarification of certain definitions [2007] OJ L 56M/134.

¹¹² Before the Commission Directive, the national Competent Authorities adopted widely different approaches regarding eligible products ranging from risk-averse to extremely lenient, the Commission Directive aimed to solve the confusion surrounding the eligible assets under the UCITS regime, see Moloney, *EU Securities and Financial Markets Regulation* (n 30) 225.

¹¹³ Commission Directive 2007/16/EC of 19 March 2007 implementing Council Directive 85/611/EEC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards the clarification of certain definitions [2007] OJ L 56M/134.

¹¹⁴ Preamble (4) Commission Directive 2007/16/EC of 19 March 2007 implementing Council Directive 85/611/EEC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards the clarification of certain definitions [2007] OJ L 56M/134.

¹¹⁵ Article 2 (1)(n) UCITS-Directive.

¹¹⁶ Article 2 (1) Commission Directive 2007/16/EC of 19 March 2007 implementing Council Directive 85/611/EEC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards the clarification of certain definitions [2007] OJ L 56M/134.

address at EFAMA's Investment Management Forum in Brussels.¹¹⁷ Although these types of securities comply with the formal requirements under the UCITS regime, it is less clear whether these investments are liquid enough to withstand large redemptions in a downturn. Take our example of a UK corporate bond index fund. Corporate bonds are captured by the definition of transferable instruments, but as shown in chapter three the liquidity of corporate bonds is not absolute and depends on the general market conditions.

Recent events show that liquidity issues in UCITS are not a mere theoretical speculation. More specifically, in 2018 and 2019, three asset managers with funds under the UCITS directive – more specifically GAM, Woodford, and H20 – made headlines because their funds experienced significant outflows due to a combination of poor past performance and a decrease in the fund portfolio's liquidity. GAM had to gate their investors' money after the dismissal of one of their star traders – based on alleged misconduct – resulted in significant outflows of the relevant funds. The illiquidity of the funds' holdings threatened to hamper their ability to meet redemption requests. The Woodford equity income fund, moreover, faced significant outflows after a series of bad stock picks. This resulted in the need to suspend redemption as a significant amount of its assets were invested in illiquid holdings, such as unquoted and less liquid stock. H20 experienced significant outflows after the Financial Times reported that H20 had bought significant holdings in illiquid bonds linked to the German entrepreneur Windhorst across six of its funds. Although these events turned out not to be systemic, they did raise concerns about the liquidity of the holdings of UCITS.

To be clear, the Commission Directive does specify that the liquidity of the security should not compromise the ability of the UCITS to comply with redemption requests.¹¹⁸

¹¹⁹ A management company or a UCITS should also employ a risk management process that allows for the monitoring and measuring of the risks of positions and their relation to the overall risk profile of the UCITS' portfolio.^{120 121} The final power to decide on the

¹¹⁷ More specifically, he stated that 'since 2013, EU investment funds increased their holdings of corporate bonds rated BBB from 31% to 35% and, for some of them, reduced their cash holdings. While liquid under current market conditions, BBB bonds are susceptible to become less liquid as risk perceptions and underlying credit conditions change. [...Moreover...] there is a rotation from equity to bond funds, and from equity ETFs to bond ETFs, the latter growing by 55% over the last 2 years. We also see evidence of funds, including ETFs, investing in less liquid markets such as commodity, gold or high yield. Eventually, this may lead to unrealistic expectations of liquidity, if the perceived liquidity of these funds does not reflect the liquidity of their underlying', see Steven Maijor, 'Keynote Address EFAMA Investment Management Forum 22 November 2019, Brussels' [2019] ESMA.

¹¹⁸ Article 2 (1) Commission Directive 2007/16/EC of 19 March 2007 implementing Council Directive 85/611/EEC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards the clarification of certain definitions [2007] OJ L 56M/134.

¹¹⁹ This was recently acknowledged by the Chair of ESMA, Steven Maijor, in his keynote address at EFAMA's Investment Management Forum in Brussels: 'Moreover, the existing rules already address the concern that UCITS managers might invest in eligible assets whose liquidity profile would not be in line with their funds' redemption rules. A listing on an eligible market does not automatically mean that all specific securities of such market are actually liquid. While the Commission Level 2 Directive in 2007 ("Eligible Assets Directive") introduced a presumption of liquidity and negotiability in the case of transferable securities that are admitted or dealt in on a regulated market, it also clearly stipulates that this does not apply where information is available to the UCITS that would lead to a different determination', see Maijor (n 117).

¹²⁰ Article 51 (1) UCITS-Directive.

¹²¹ The UCITS managers have significant discretion to decide what the best course of action is related to risk management, including with respect to enabling investors to redeem their shares. In comparison to

eligibility of investments is allocated to the supervisors. Indeed, as discussed below in more detail below, the National Competent Authority ('NCA') of the home state of the UCITS will supervise the compliance with the investment policy regime and therefore will have the final decision-making power regarding eligible instruments and their liquidity. Thus, the effectiveness of the investment policy regime hinges on the effectiveness of prudential supervision.

2.1.2.2. Leverage

Turning to systemic risk problems that arise due to the use of leverage, funds can leverage their investments by borrowing cash or assets ('financial leverage') or through the implicit leverage embedded in derivatives contract ('synthetic leverage'). For example, imagine a fund that seeks to leverage an investment in shares of Company A with a notional value of GBP 100,000. The fund could borrow GBP 100,000 from a bank with a yearly interest rate of two per cent and buy shares in Company A with the borrowed sum. A similar construction can be created through the use of derivatives. More specifically, the fund could enter into a total return equity swap on the shares of Company A with a notional value of GBP 100,000 and annual payments of two per cent. The fund will be required to pay 2 per cent of GBP 100,000 on a yearly basis – i.e. GBP 2,000 – to its derivatives dealer. In exchange, it will receive payments from the dealer equal to the capital appreciation and dividends on shares of Company A worth GBP 100,000. Although the exposure for the fund is similar from an economic perspective, the use of leverage can have a significant impact on the stability of the financial system.¹²²

Regarding 'financial leverage', the UCITS-Directive prohibits an investment company from borrowing money. However, a member state can authorise a UCITS to borrow under limited circumstances. Firstly, a member state can allow an investment company to borrow up to 10 per cent of its assets on a temporary basis. Secondly, a member state can allow an investment company to borrow to enable the acquisition of immovable property, which is essential for the direct pursuit of its business. The property should not represent more than 10 per cent of the investment company's assets. The UCITS cannot borrow more than 15 per cent of its assets in total.¹²³

Turning to 'synthetic leverage', UCITS can – as part of their investment policy and within certain limits¹²⁴ – invest in financial derivatives. The UCITS-Directive limits synthetic leverage by providing that the global exposure related to derivative instruments should not exceed the total net value of the UCITS' portfolio.¹²⁵ There are different models to calculate such global exposure and it is the responsibility of the management company of the UCITS to select an appropriate methodology for its

the AIFM-Directive, the UCITS regime is less prescriptive regarding how a fund should manage its liquidity. This is because the first line of defence against a liquidity mismatch under the UCITS rules is the investment policy regime, see FCA, 'Illiquid Assets and Open-Ended Investment Funds (DP17/1)' [2017] Financial Conduct Authority Discussion Paper 20.

¹²² The example is based on a similar example provided in Dan Awrey, 'The Mechanisms of Derivatives Market Efficiency' (2016) 91 New York University Law Review 1104, 1163–1164.

¹²³ Article 83 (2) UCITS-Directive.

¹²⁴ Article 52 and 51 (3) UCITS-Directive.

¹²⁵ Art. 51(3) UCITS-Directive.

calculation, under supervision of its supervisor. The Commission Directive¹²⁶ provides more detailed guidelines regarding the calculation of the global exposure and specifies that member states can allow management companies to use the commitment approach¹²⁷, the value at risk approach¹²⁸ or other advanced risk measurement methodologies. Generally speaking, the value at risk approach leads to a higher regulatory leverage limit.¹²⁹ Moreover, where UCITS employ techniques and instruments necessary for efficient portfolio management – such as repurchase agreements or securities lending transactions – in order to generate additional leverage or exposure to market risks, these transactions should be taken into consideration when calculating global exposure.¹³⁰ In addition, ESMA (formerly ‘CESR’) adopted guidelines on the calculation of the global exposure in order to foster a level playing field among member states.¹³¹

Anecdotal evidence from some recent cases of significant outflows in UCITS funds¹³² casts doubt on the effectiveness of the current leverage framework. More specifically, a study by the ECB suggests that leverage might have amplified these outflows.¹³³ Indeed, leverage limits are not necessarily a good proxy for leverage-related risk, as the risks posed by leverage can only be evaluated by assessing a fund’s portfolio as a whole¹³⁴, considering the interconnectedness with the financial system.¹³⁵ Such an overall assessment is difficult to translate into regulatory limits. The UCITS regime regarding financial leverage is rather stringent, but there is significant flexibility for UCITS regarding the calculation of the limits on synthetic leverage. The open-ended nature of the norms is then complemented with supervision by the prudential

¹²⁶ Article 41 (3) Commission Directive 2010/43/EU of 1 July 2010 implementing Directive 2009/65/EC of the European Parliament and of the Council as regards organisational requirements, conflicts of interest, conduct of business, risk management and content of the agreement between a depositary and a management company [2010] OJ L 176/42.

¹²⁷ In the commitment approach derivatives are converted into the market value of an equivalent position in the underlying asset of that derivative, see article 42 (2) Commission Directive 2010/43/EU of 1 July 2010 implementing Directive 2009/65/EC of the European Parliament and of the Council as regards organisational requirements, conflicts of interest, conduct of business, risk management and content of the agreement between a depositary and a management company [2010] OJ L 176/42.

¹²⁸ The value at risk approach is a risk-based approach, which determines the maximum potential loss under normal market conditions, in a set time period, and with a given probability.

¹²⁹ Luis Molestina Vivar, Michael Wedow and Weistroffer Christian, ‘Burned by Leverage? Procyclical Flows and Fragility in Mutual Bond Funds’ [forthcoming] ECB Working Paper Series.

¹³⁰ Article 41 (4) Commission Directive 2010/43/EU of 1 July 2010 implementing Directive 2009/65/EC of the European Parliament and of the Council as regards organisational requirements, conflicts of interest, conduct of business, risk management and content of the agreement between a depositary and a management company [2010] OJ L 176/42.

¹³¹ CESR, ‘Guidelines on Risk Measurement and the Calculation of Global Exposure and Counterparty Risk 2010’, CESR/10-788.

¹³² In 2018 and 2019, three asset managers with funds under the UCITS directive – more specifically GAM, Woodford, and H2O – made headlines because their funds experienced significant investors outflows due to a combination of poor past performance and a decrease in the fund portfolio’s liquidity.

¹³³ The ECB study shows that outflows in funds are larger in leveraged UCITS compared to unleveraged UCITS. They argue that given the same amount of net outflows in a leveraged and an unleveraged fund, a leveraged fund will need to sell more assets in order to cover margin calls and increased haircuts than the unleveraged fund. Such asset sales in times of crisis could lead to higher losses for leveraged funds. In order to avoid suffering losses from additional asset sales in a downturn, investors in leveraged funds are incentivised to redeem early, see Molestina Vivar, Wedow and Christian (n 129).

¹³⁴ House of Lords European Union Committee, *Directive on Alternative Investment Fund Managers: 3rd Report of Session 2009-10*, vol 1 (Stationery Office 2010).

¹³⁵ Molestina Vivar, Wedow and Christian (n 129).

authorities. Again, this emphasizes the importance of the supervisory function for the effectiveness of the UCITS regime.

2.1.3. The AIFM-Directive

The AIFM-Directive introduces common requirements for the authorisation of AIFM.¹³⁶ Once authorised, the AIFM needs to comply with strict operating conditions.¹³⁷ In our stylised example of a long-short equity fund, systemic risk originated from the use of leverage. The AIFM-Directive, however, does not set leverage limits.¹³⁸ The AIFMs themselves must set a maximum level of leverage considering a variety of factors, including systemic risk.¹³⁹ The ever-evolving and elusive nature of the concept of systemic risk illustrates the open-ended and vague nature of the AIFM norm, making it difficult to determine the boundaries of its application. The Directive only requires that the AIFM demonstrates that the leverage limits used for its AIFs are reasonable and that it ensures that the AIF's portfolio stays within those leverage limits. In its Delegated Regulation, the Commission provides detail with respect to the calculation of leverage.¹⁴⁰ The national securities authorities must then monitor and enforce the leverage limits.

Similarly, with respect to systemic risk due to a possible liquidity mismatch, there is limited 'external' regulation of the liquidity management under the AIFM-Directive. The EU framework mainly relies on 'internal' control mechanisms to manage liquidity risks. More specifically, the AIFM-Directive requires that AIFMs employ appropriate liquidity management systems for funds that are not unleveraged closed-ended AIFs, which includes stress-testing and ensuring that the liquidity of the investments matches the underlying redemption obligations.¹⁴¹ The Commission provides more detail regarding liquidity management.¹⁴² The managers should demonstrate to the NCAs that an appropriate liquidity management system is in place, calibrated to – amongst other things – the liquidity profile and the redemption policy of the AIF.¹⁴³ The norms focus on the procedural aspects of liquidity management. In other words, the EU framework

¹³⁶ The authorisation conditions under the AIFM-Directive (article 6-8 AIFM-Directive) subject AIFMs to limitations on the range of activities they can carry out, capital requirements, 'fit and proper' requirements for those effectively conducting the business, a qualifying shareholders regime, a requirement regarding the alignment of head office and the registered office, and limitations on close links. The authorisation in the home member state is valid in all other member states (article 8 (1) AIFM-Directive).

¹³⁷ Article 12-21 AIFM-Directive.

¹³⁸ ESMA launched a consultation paper seeking stakeholders' input and feedback on its proposed principles to set leverage limits for AIF. However, simple leverage caps could force AIF to unwind during a crisis with potential procyclical effects, see ESMA, 'Consultation Paper Guidelines on Article 25 of Directive 2011/61/EU of 27 March 2020', ESMA34-39-967.

¹³⁹ Article 15 (4) AIFM-Directive.

¹⁴⁰ Article 6-11 Commission Delegated Regulation (EU) 231/2013 of 19 December 2012 supplementing Directive 2011/61/EU of the European Parliament and of the Council with regard to exemptions, general operating conditions, depositaries, leverage, transparency and supervision [2012] OJ L 83/1.

¹⁴¹ Article 16 AIFM-Directive.

¹⁴² Article 46-49 Commission Delegated Regulation (EU) 231/2013 of 19 December 2012 supplementing Directive 2011/61/EU of the European Parliament and of the Council with regard to exemptions, general operating conditions, depositaries, leverage, transparency and supervision [2012] OJ L 83/1.

¹⁴³ Article 46 Commission Delegated Regulation (EU) 231/2013 of 19 December 2012 supplementing Directive 2011/61/EU of the European Parliament and of the Council with regard to exemptions, general operating conditions, depositaries, leverage, transparency and supervision [2012] OJ L 83/1.

mainly relies on ‘internal’ control mechanisms combined with prudential supervision to ensure liquidity is managed effectively, rather than ‘external’ prudential regulation.

To be clear, the liquidity management rules blur the conceptual boundaries between ‘external’ regulation and ‘governance’ or ‘internal’ regulation. To a great extent, such rules define the boundaries of the range of actions agents can take by determining the tools agents can use to make decisions and can therefore be considered ‘governance’ regulation. However, where the rules make substantive decisions on what factors should be considered when managing risks, the rules make an ‘external’ decision on the content of decisions rather than imposing a decision-making process. For example, article 48 of the Delegated Regulation describes the content of the stress tests, which will inevitably influence the range of actions that the institutions will take as a result of such stress tests.¹⁴⁴

The regulation of the structure or composition of the portfolios of AIFs is left to the member states. It was considered too difficult to implement such a detailed regime given the wide variety of AIFs active on the market. Indeed, the scope of the AIFM-Directive includes a panoply of funds – including hedge funds, private equity, real estate funds, commodity funds, and many more – with distinctly differing risk profiles. National regulation, however, should not prevent AIFs established in one member state to manage and market in another member state’s market by imposing additional requirements.¹⁴⁵

In sum, although the AIFM-Directive marked a significant increase in the amount of regulation applicable to investment funds captured by the definition of AIF, the norms are vague and open-ended, leaving significant responsibility to internal control mechanisms combined with supervision by the NCAs. However, as discussed below, the EU supervisory framework does not necessarily guarantee close monitoring. In its 2017 shadow banking report, the ESRB warned that the lack of formal leverage limits for hedge funds requires a close monitoring of hedge funds.¹⁴⁶ In response, ESMA launched a consultation paper seeking stakeholders’ input and feedback on its proposed principles to set leverage limits for AIFs.¹⁴⁷ Such proposals need to be treated with caution, as simple leverage caps could force AIF to unwind during a crisis with potential procyclical effects.

2.2. CCPs

Chapter four argued that the shareholders of CCPs have perverse incentives to postpone loss allocation and mutualisation to the post-default stage beyond what would be considered prudent from a systemic risk perspective. This is because in times of distress they can potentially externalise part of the default losses due to their limited liability, correlation of counterparty defaults (‘I’ll be gone, You’ll be gone’), and the likelihood of government bail-out.

¹⁴⁴ Article 48 Commission Delegated Regulation (EU) 231/2013 of 19 December 2012 supplementing Directive 2011/61/EU of the European Parliament and of the Council with regard to exemptions, general operating conditions, depositaries, leverage, transparency and supervision [2012] OJ L 83/1.

¹⁴⁵ Preamble (10) AIFM-Directive.

¹⁴⁶ European Systemic Risk Board, *EU Shadow Banking Monitor May 2017* (European Systemic Risk Board 2017) 18.

¹⁴⁷ ESMA, ‘Consultation Paper Guidelines on Article 25 of Directive 2011/61/EU of 27 March 2020’, ESMA34-39-967.

Acknowledging the importance of prudent risk management, the EU regulators have accompanied the CCP mandate with substantial prudential regulation. Such prudential norms aim to ensure that CCPs have adequate procedures and appropriate financial resources in place to manage clearing member default. However, as shown below, these rules are open-ended with respect to the level of financial resources needed as well as the allocation of resources to pre-default and post-default contributions in the waterfall. Hereunder, the section first discusses the rules regarding the CCP default waterfall as found in EMIR. It distinguishes between funds in the waterfall that must be provided pre-default of a clearing member and those that must be provided post-default. Then, it shows that these rules are incomplete and leave ample discretion ex-post.

With regard to funds provided pre-default, EMIR formalised the already existing requirement in practice that CCPs ask clearing members to post initial and variation margin to collateralise their transactions with the CCP.¹⁴⁸ CCPs are now also obliged to establish a default fund through clearing members' contributions to mutualise the losses.¹⁴⁹ EMIR requires that the default fund can withstand, under extreme but plausible market conditions, the default of the clearing member with the largest exposures or of the second and third largest clearing members together, whichever exposure is greater.¹⁵⁰ In addition to contributions by the clearing members, EMIR also requires that the CCP itself will make sure it puts aside some pre-default financial resources to cover potential losses.¹⁵¹ The default fund and these dedicated resources set aside by the CCP should cover, under extreme but plausible market conditions, at least the default of the two clearing members to which the CCP has the largest exposure.¹⁵² With regard to funds provided post-default, EMIR stipulates that clearing members' contributions post-default should be limited.¹⁵³

Although outside the scope of the default waterfall according to art. 45, EMIR provides that the CCP capital should absorb the losses that are not already covered by the margin requirements, default fund, dedicated financial resources of the CCP, liquidity risk controls, and capital calls.¹⁵⁴ In this context, EMIR obliges CCPs to have a permanent and available initial capital of at least EUR 7.5 million to absorb losses after all other resources are exhausted.¹⁵⁵

CCPs must have a detailed default management procedure in place.¹⁵⁶ EMIR imposes a mandatory hierarchy for the funds in the waterfall in the case of a default of a clearing member (Figure 1).¹⁵⁷ The CCP must first use the margin posted by the defaulting member before using the defaulter's contribution to the default fund. Up to this point, the waterfall operates according to the 'defaulter pays' model in that the first losses are borne by the defaulting clearing member. When all the defaulting member's funds are used, the waterfall switches to risk sharing. In that context, the CCP should rely on its own dedicated financial resources, before using the contributions of the non-

¹⁴⁸ Art. 41 EMIR.

¹⁴⁹ Art. 42 EMIR.

¹⁵⁰ Art. 42 (3) EMIR.

¹⁵¹ Art. 43 EMIR.

¹⁵² Art. 43 (2) EMIR.

¹⁵³ Art. 43 (3) EMIR.

¹⁵⁴ Art. 16 (2) EMIR.

¹⁵⁵ Art. 2 (25) and 16 EMIR and art. 22 of Council Directive 86/635/EEC of 8 December 1986 on the annual accounts and consolidated accounts of banks and other financial institutions.

¹⁵⁶ Art. 48 EMIR.

¹⁵⁷ Art. 45 EMIR.

defaulting clearing members. As a result, the CCP has some ‘skin in the game’, before other non-defaulting clearing members have to contribute to the losses.

To be clear, in cases of client clearing, the client will post margin to the clearing member, who will post it to the CCP to cover the clearing member’s own contractual obligation to the CCP. EMIR requires CCPs to keep the client’s margin separate.¹⁵⁸ The client’s margin can only be used to cover the positions held for the client’s account.¹⁵⁹ However, when a client of a clearing member fails, their posted margin will be used as a first line of defence. This is in line with the ‘defaulter pays’ model.

The prudential norms under EMIR are open-ended with respect to the size of the financial resources as well as how much of the waterfall to allocate to pre-default contributions and post-default contributions. More specifically, EMIR only provides some minimum amounts with regard to pre-default funds and leaves the final responsibility with the CCP for developing the models to calculate the amount of margin requirements¹⁶⁰, the amount of default fund contribution¹⁶¹, the amount of dedicated own resources¹⁶², and the amount of equity¹⁶³. The technical standards adopted by the commission formulate some additional guidance regarding the calculations.¹⁶⁴ Moreover, proposals are currently under way to include clearing systems for financial instruments in the regulatory competences of the ECB. This would allow the ECB to adopt regulations regarding clearing systems to the extent necessary for monetary policy purposes.¹⁶⁵ In sum, again, the effectiveness of the regime hinges on the effectiveness of prudential supervision.

Such incompleteness is unavoidable, as uniform prescriptions regarding financial resources – if even possible – would conflict with the unique risk profile of each CCP.¹⁶⁶ Moreover, the calculation of the resources necessary often depends on intimate and very variable information regarding the portfolios cleared, placing the lawmaker at an information disadvantage compared to CCPs. Take the example of the calculation of the cover 2 requirement under EMIR, which requires that the default fund and the dedicated resources cover at least the default of the two clearing members to which the CCP has the largest exposure.¹⁶⁷ In order to calculate the cover 2 requirement, CCPs construct a range of unfavourable historical (e.g. the 2008 credit crisis,) or hypothetical market scenarios and subject the portfolios to be stressed to these scenarios in order to determine the financial impact of each scenario. The calculation of the cover 2

¹⁵⁸ See 39 (2) and (3) EMIR.

¹⁵⁹ Art. 48 (7) EMIR.

¹⁶⁰ Article 41 EMIR.

¹⁶¹ Article 42 EMIR.

¹⁶² Article 43 EMIR.

¹⁶³ Article 16 EMIR.

¹⁶⁴ Commission Delegated Regulation (EU) No 153/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on requirements for central counterparties.

¹⁶⁵ Commission, ‘Opinion on the Recommendation of the European Central Bank for a Decision of the European Parliament and of the Council amending Article 22 of the Statute of the European System of Central Banks and of the European Central Bank’ (opinion) C(2017) 6810 final.

¹⁶⁶ JP Morgan, ‘A Balancing Act - Aligning Incentives through Financial Resources for Effective CCP Resilience, Recovery and Resolution’ [2017] Office of Regulatory Affairs 1; David Murphy and Paul Nahai-Williamson, ‘Dear Prudence, Won’t You Come out to Play? Approaches to the Analysis of Central Counterparty Default Fund Adequacy’ [2014] Financial Stability Paper 1.

¹⁶⁷ The default fund and these dedicated resources set aside by the CCP should cover, under extreme but plausible market conditions, at least the default of the two clearing members to which the CCP has the largest exposure, see art. 43 (2) EMIR.

requirement is therefore determined by both the stress scenario constructed as well as the portfolios stressed. Where the former tends not to change on a day-to-day basis or be CCP specific, the portfolios cleared are very volatile and unique to each CCP. As a result, the challenge lies in ensuring that the stress tests are genuinely representative for the portfolios the CCP clears. To be clear, the scenarios used should not be entirely static either and need to be adjusted to newly identified vulnerabilities.¹⁶⁸ As discussed below, prudential authorities might actually be at an informational advantage for identifying such new vulnerabilities in the market.

Hierarchy of financial resources in the default waterfall (art. 45 EMIR)	
Provided pre-default	SELF-INSURANCE OF RISK
	1. Margin posted by defaulting clearing member
	2. Default fund contribution of defaulting clearing member
	RISK SHARING
	3. CCP's own dedicated resources
Provided post-default	4. Non-defaulting clearing members' default fund contributions
	5. Capital calls on non-defaulting clearing members

Figure 1 Hierarchy of financial resources in the default waterfall

¹⁶⁸ For a more detailed explanation of the calculation of the cover 2 requirement, see Murphy and Nahai-Williamson (n 166) 5–6.

3. Prudential supervision as gap-filler: the case studies

In the EU, supervision of the financial system is organised through the European system of financial supervision ('ESFS'). The ESFS brings together national and European supervisors in order to ensure the consistent and appropriate supervision of the financial system in the EU, both on a macroprudential and a microprudential level. The ESFS is a network consisting of the European Systemic Risk Board ('ESRB'), the three ESAs, and the national competent authorities ('NCAs'). The ESAs and the NCAs are primarily tasked with microprudential supervision, while the ESRB¹⁶⁹ (together with the ECB) focuses on macroprudential supervision. The ESRB and the ESAs coordinate their work through the Joint Committee.¹⁷⁰

Under the ESFS, the NCAs retain – as a general rule – their competence to supervise institutions. In the UK, for example, asset managers and their funds are supervised by the Financial Conduct Authority. CCPs are supervised by the Bank of England. ESMA in turn is tasked with fostering supervisory convergence and supervisory cooperation across borders with respect to the asset management and clearing business. For example, NCAs of the home member state of the AIFM can impose limits regarding leverage on the AIF under management, where they deem such limits necessary to ensure the stability and integrity of the financial system. They should notify ESMA, the ESRB, and the competent authorities of the AIF involved. Moreover, ESMA performs a coordination role and can issue advice to the NCAs when it considers the leverage used by AIFMs problematic for the stability and integrity of the financial system. The advice is not binding, but if the NCA chooses not to follow the advice, ESMA can make such non-compliance public.¹⁷¹

4. The limits of prudential supervision: the case studies

The determinants of effective prudential supervision can turn out to be elusive in practice for at least three reasons. First, prudential supervision is limited by jurisdictional boundaries, potentially leading to supervisory competition and a 'race to

¹⁶⁹ The ESRB is 'responsible for the macro-prudential oversight of the financial system within the Union in order to contribute to the prevention or mitigation of systemic risks to financial stability in the Union that arise from developments within the financial system and taking into account macroeconomic developments, so as to avoid periods of widespread financial distress' (article 3 ESRB Regulation). The ESRB's mission is very broad and encompasses 'all financial institutions, markets, products and market infrastructures' (article 2 (b) ESRB Regulation). Systemic risk is defined as 'a risk of disruption in the financial system with the potential to have serious negative consequences for the internal market and the real economy. All types of financial intermediaries, markets and infrastructure may be potentially systemically important to some degree' (article 2 (c) ESRB Regulation).

¹⁷⁰ See Article 2 (3) European Parliament and Council Regulation (EU) 1093/2010 of 24 November 2010 establishing a European Supervisory Authority (European Banking Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/78/EC [2010] OJ L 331/12 ('EBA Regulation'); Article 2 (3) European Parliament and Council Regulation (EU) 1094/2010 of 24 November 2010 establishing a European Supervisory Authority (European Insurance and Occupational Pensions Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/79/EC [2010] OJ L 331/48 (hereafter 'EIOPA Regulation'); Article 2 (3) European Parliament and Council Regulation (EU) 1095/2010 of 24 November 2010 establishing a European Supervisory Authority (European Securities and Markets Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/77/EC [2010] OJ L 331/84 ('ESMA Regulation').

¹⁷¹ Article 25 AIFM-Directive.

the bottom’ amongst NCAs regarding prudential requirements.¹⁷² Indeed, prudential authorities do not necessarily act in the public interest and self-interest of the parties involved can affect the effectiveness of the prudential framework. Second, in practice, prudential supervision is often a far cry from the iterative and flexible process described above, leaving significant leeway to the regulated actors. Finally, the complex and dynamic nature of the financial system leads to an enormous informational challenge for the public authorities, which can hinder effective supervision. This section argues that the resulting imperfections of prudential supervision carve out a role for governance regulation. More specifically, the importance of governance regulation in the EU is a function of at least three variables: supervisory competition regarding prudential requirements, the level of residual discretion of the regulated actors, and the locus of information.

4.1. Supervisory competition regarding prudential requirements

This section argues that governance can play a role in the prudential framework as a means to address the challenges resulting from the decentralised nature of the supervisory structure in the EU. First, the section lays out the problem with respect to supervisory competition. Then it discusses the role of ESMA. Finally, the section carves out a role for governance regulation.

4.1.1. The problem

As discussed above, the EU has significantly harmonised the prudential norms applicable to CCPs and asset managers, reducing *regulatory* competition in the EU. However, the open-ended nature of the norms leaves ample of room for manoeuvre for the prudential supervisor, which – in the EU – is organised at the national level and relies on the NCAs.¹⁷³ As a result, the single rulebook has all but eliminated opportunities for a ‘race to the bottom’ as the incompleteness of the prescriptive norms leaves room for competition through supervisory practice (i.e. *supervisory* competition).¹⁷⁴ Indeed, as a general rule, ESMA does not have direct supervisory powers. The exception is the direct supervisory powers of ESMA with respect to trade

¹⁷² For a discussion of the importance of supervisory convergence in order to achieve uniformity in EU securities regulation, see Luca Enriques and Matteo Gatti, ‘Is There a Uniform EU Securities Law after the Financial Services Action Plan?’ (2008) 14 *Stanford Journal of Law, Business & Finance* 43.

¹⁷³ As a general rule, the authorities of the home member state are competent to supervise the compliance with the requirements of the UCITS-Directive (article 97 UCITS-Directive). The UCITS-Directive imposes a general cooperation obligation on the national authorities of the member states wherever necessary for carrying out their duties or exercising their powers under the UCITS-Directive. In addition, the UCITS-Directive provides for some specific obligations regarding information provision, notifications, and on-the-spot verification or in an investigation on the territory of another member state (article 101 UCITS-Directive). The competent authorities also need to cooperate with ESMA and provide ESMA with all the information necessary for performing its duties (article 101 (2a) UCITS-Directive). Similarly, the national authorities supervise the compliance with the AIFM-Directive (article 44 AIFM-Directive). The Directive also puts in place a cooperation regime between the authorities of the different member states amongst themselves and with ESMA (article 50-54 AIFM-Directive). ESMA has dispute resolution powers (article 55 AIFM-Directive). A similar regime is in place under EMIR (article 22-24 EMIR).

¹⁷⁴ The early stages of the Brexit negotiations, where NCAs of the remaining EU-27 jockeyed for a share of the UK financial services business, are illustrative in this context, see Moloney, *The Age of ESMA: Governing EU Financial Markets* (n 53) 184.

repositories¹⁷⁵ and credit rating agencies¹⁷⁶. Therefore, even though there is significant harmonisation with respect to regulation ('the law on the books'), the decentralised nature of prudential supervision could lead to divergence with respect to 'the law in action' applicable in the different member states. A study by the Basel Committee on Banking Supervision – which looks at the implementation of risk-weighted assets ('RWAs') methodologies under Basel III – finds that some of the variation across banks in average RWAs could be explained through differences in supervisory practices.¹⁷⁷

Such divergence in supervisory practice amongst member states can lead to supervisory arbitrage, where financial institutions have incentives to shop for an attractive supervisory regime. Moreover, member states that are looking to attract businesses (e.g. to generate additional tax revenue) have incentives to adopt a prudential framework favourable to business. However, as shown in previous chapters, the incentives of financial institutions – which operate under the traditional shareholder value maximisation paradigm – are not aligned with prudential goals due to the presence of systemic externalities. As a result, a prudential framework which forces businesses to internalise the costs of systemic failure, is unlikely to appeal to financial institutions. In the EU, this could induce the NCAs to be more lenient towards financial institutions than is desirable from a systemic risk perspective. Moreover, even absent any competition between supervisors, the fact that NCAs have varying resources and capabilities means that they cannot necessarily implement their gap-filling role in a consistent or particularly effective way.

4.1.2. ESMA's supervisory convergence powers

In order to prevent such supervisory arbitrage and a 'race to the bottom' between member states¹⁷⁸, ESMA is charged with fostering supervisory convergence and supervisory cooperation across borders.¹⁷⁹ In order to achieve this goal, ESMA has a variety of tools at its disposal.¹⁸⁰ More specifically, ESMA coordinates the colleges of supervisors established under the legislative acts within ESMA's competence¹⁸¹, is allocated tasks related to the monitoring and identification of systemic risk¹⁸², periodically organises and conducts peer reviews of competent authorities¹⁸³, has

¹⁷⁵ European Parliament and Council Regulation (EU) 648/2012 of 4 July 2012 on OTC derivatives, central counterparties and trade repositories [2012] OJ L201.

¹⁷⁶ European Parliament and Council Regulation (EU) 462/2013 of 21 May 2013 amending Regulation (EC) No. 1060/2009 on credit rating agencies [2013] OJ L146.

¹⁷⁷ Basel Committee, on Banking Supervision and BIS/BCBS, *Regulatory Consistency Assessment Programme (RCAP) - Analysis of Risk-Weighted Assets for Credit Risk in the Banking Book* (Bank for International Settlements 2013).

¹⁷⁸ See for example ESMA, 'Supervisory Convergence Work Programme 6 February 2019' ESMA42-114-647, 5.

¹⁷⁹ Preamble 41 ESMA Regulation.

¹⁸⁰ Commission (n 89) 8.

¹⁸¹ Such as powers regarding information collection rights and the initiation of EU-wide stress tests, see article 21 ESMA Regulation.

¹⁸² In particular, ESMA can conduct an inquiry into a type of financial activity, product, or conduct in order to assess the potential threats to the integrity and stability of the financial system. If it is considered necessary, ESMA can make appropriate recommendations for action to the relevant competent authorities (article 22 (4) ESMA Regulation). Moreover, together with the ESRB, ESMA is also in charge of developing criteria for the identification and measurement of systemic risk and an adequate stress testing regime (article 23 ESMA Regulation).

¹⁸³ Article 30 ESMA Regulation.

capacity to act in emergency situations¹⁸⁴, settles disputes between competent authorities through a binding mediation procedure¹⁸⁵, and can investigate a breach of Union laws by a NCAs¹⁸⁶.

Since 2015¹⁸⁷, ESMA has become a dynamic actor in the supervisory convergence scene and has made active use of its new supervisory convergence powers. ESMA has been particularly active with respect to setting common supervisory practices for CCPs through participation in supervisory colleges, model valuations, peer reviews of NCAs, EU-wide stress tests, and the development of Q&As, guidelines and opinions.^{188 189} ESMA also aims to foster common supervisory approaches in respect of UCITS and AIFs¹⁹⁰, for example regarding performance fees.¹⁹¹ In 2020, ESMA launched a Common Supervisory Action with NCAs regarding the supervision of the liquidity risk management in UCITS in order to promote supervisory convergence.¹⁹² ESMA also published draft guidelines aimed at promoting supervisory convergence amongst NCAs regarding the supervision of systemic risk due to the use of leverage in the AIF sector.¹⁹³ As a result, ESMA is increasingly influencing the NCAs' supervisory practices and moulding it into a European template.¹⁹⁴ Furthermore, in its public consultation statement, the Commission proposes to expand ESMA's mandate with respect to the asset management industry and central counterparties.¹⁹⁵

However, ESMA's supervisory convergence activities are not a panacea for all jurisdictional challenges. Firstly, it will be difficult to foster convergence on certain politically sensitive issues. For example, it is argued that ESMA is unlikely to use its peer review function in order to encourage the use of risk-based supervision to the extent that it forces NCAs to take on political risk, for example regarding the level of failure the

¹⁸⁴ More specifically, ESMA has powers to take actions in emergency situations to coordinate and facilitate the actions of the national competent supervisory authorities (article 18 ESMA Regulation).

¹⁸⁵ Article 19 and 20 ESMA Regulation.

¹⁸⁶ More specifically, if a competent authority is in breach of Union laws within ESMA's competence – in particular by failing to ensure compliance by individual financial institutions, ESMA can investigate the breach and issue a recommendation to the competent authority. Where the competent authority does not comply with the recommendation, the Commission may issue a formal opinion requiring action from the competent authority. If the non-compliance persists, ESMA can adopt an individual decision addressed to a financial institution – under the condition that the relevant acts are directly applicable to the financial institutions – with a requirement to take the actions necessary to comply with Union law (article 17 ESMA Regulation).

¹⁸⁷ ESMA, 'ESMA Strategic Orientation 2016-2020'.

¹⁸⁸ ESMA, 'Supervisory Convergence Work Programme 6 February 2019' ESMA42-114-647, 13.

¹⁸⁹ Moloney, *The Age of ESMA : Governing EU Financial Markets* (n 53) 178.

¹⁹⁰ ESMA, 'Supervisory Convergence Work Programme 6 February 2019' ESMA42-114-647, 26-27.

¹⁹¹ ESMA, 'Consultation Paper Guidelines on performance fees in UCITS 19 July 2019', ESMA34-39-881.

¹⁹² Under this action, NCAs will assess market participants' compliance with UCITS rules based on a common methodology (e.g. scope, methodology, expectations, timeline) developed together with ESMA. The NCAs will first request data from UCITS managers, then the NCAs will conduct a more detailed analysis of a smaller sample. Data will be shared through ESMA in order to promote supervisory convergence in the supervision of liquidity risk management, see ESMA, 'ESMA Launches a Common Supervisory Action with NCAs on UCITS Liquidity Risk Management' (30 January 2020) <<https://www.esma.europa.eu/press-news/esma-news/esma-launches-common-supervisory-action-ncas-ucits-liquidity-risk-management>> accessed 4 June 2020.

¹⁹³ ESMA, 'Consultation Paper Guidelines on Article 25 of Directive 2011/61/EU of 27 March 2020', ESMA34-39-967.

¹⁹⁴ Moloney, *The Age of ESMA : Governing EU Financial Markets* (n 53) 178.

¹⁹⁵ Commission (n 89) 17–18.

NCAAs are willing to tolerate in the risk-based framework.¹⁹⁶ Moreover, the prudential framework will necessarily leave some discretion at the level of the NCAs, as macro-economic consequences might vary across the different member states and NCAs will be better placed to assess those local risks. Finally, ESMA is not free of conflicts of interest itself. The Commission, for example, stated in its public consultation that the current composition of the Board of Supervisors¹⁹⁷ can lead to conflicts of interest and might not guarantee that the Board of Supervisors will operate in the best interests of the EU as a whole.¹⁹⁸ Indeed, only the members of the NCAs have voting rights in the Board of Supervisors.¹⁹⁹ For example, in a 2014 report – evaluating the operations of the ESAs and the ESFS – the Commission noted that the set-up of the ESAs’ Board of Supervisors possibly impacts the incentives to issue recommendations or binding decisions under articles 17-19 of the relevant ESA Regulation.²⁰⁰

4.1.3. Governance as a complement

EU-level governance regulation can serve as a useful complement to the EU prudential framework in order to mitigate the issues related to supervisory competition among NCAs. Governance rules are less affected by macro-economic change than traditional ‘external’ prudential norms and will therefore be more easily stipulated ex-ante at the EU-level. This is because governance rules specify decision-making processes, rather than discrete limits to financial institution’s behaviour. For example, as argued above, the liquidity of assets tends to vary over time and it is therefore difficult – ex-ante – to determine the liquidity risks attached to investments in a certain asset class. Governance interventions – such as liability rules for the agent – tend to be less dependent on such macro-economic conditions²⁰¹, allowing for a higher degree of ex-ante completeness of the norms at the EU level.²⁰² As it will be easier to adopt a ‘unified

¹⁹⁶ Niamh Moloney, ‘Supervision in the Wake of the Financial Crisis. Achieving Effective “Law in Action” — A Challenge for the EU’ in E Wymeersch, Klaus J Hopt and Guido Ferrarini (eds), *Financial regulation and supervision : a post-crisis analysis* (Oxford University Press 2012) 105.

¹⁹⁷ The Board of Supervisors is the main decision-making body of ESMA. The Board of Supervisors is composed of the Chairperson, the head of the national public authority competent for the supervision of financial market participants in each Member State, one representative of the Commission; one representative of the ESRB, one representative of each of the other two ESAs (Article 40 (1) ESMA Regulation).

¹⁹⁸ Commission (n 89).

¹⁹⁹ The Chairperson and the representative of the Commission, of the ESRB, and of the two other ESAs have no voting rights in the Board (Article 40 (1) ESMA Regulation).

²⁰⁰ Commission, ‘Report from the Commission to the European Parliament and the Council on the operation of the European Supervisory Authorities (ESAs) and the European System of Financial Supervision (ESFS)’ (‘Report’) COM/2014/0509 final, 7.

²⁰¹ Pistor and Xu argue that areas of the law that are affected by exogenous change (e.g. socioeconomic and/or technological change) tend to be more incomplete than areas unaffected by such change, see Pistor and Xu (n 11) 932–933.

²⁰² With respect to the corporate governance of banks, authors have argued for the increased harmonisation of governance standards in order to ensure a level playing field: ‘As to the European Union, it must be remembered that the CRD IV is being transformed into national law with the consequence that the enforcement standards vary widely. Harmonisation not only of substantive law but also of the related procedural and enforcement law, including the concretization of the fit and proper rule and the liability of the supervisors, is needed to ensure a level playing field in the governance of European banks’, see Paul Davies and Klaus J Hopt, ‘Non-Shareholder Voice in Bank Governance’ in Danny Busch, Guido Ferrarini and Gerard van Solinge (eds), *Governance of financial institutions* (First Edition, Oxford University Press 2019) 152.

governance architecture' at the federal level, there will be less scope for supervisory competition amongst NCAs regarding *governance* requirements.

Such unified governance architecture will then mitigate the issues related to supervisory competition related to traditional *prudential* requirements in at least two ways. First, governance interventions – which detach the incentives of agents from the shareholder value maximisation paradigm – will loosen the incentives of agents to search for opportunities for arbitrage in order to maximise shareholder value. Relatedly, decreased incentives of agents to shop or lobby for an attractive supervisory regime will in turn decrease the incentives for NCAs themselves to engage in a race to the bottom regarding prudential requirements.

Second, and more importantly, governance interventions seek to ensure that the incentives of agents are aligned with the public interest, so that they take the 'right' choice by themselves. More specifically, governance regulation will encourage agents to fill in the gaps left by prudential regulation in line with the public interest. In other words, under well-designed governance rules, private agents substitute for the gap-filling role played by supervisors in the purely 'external' model.

To be clear, supervision will still play a role, as governance intervention cannot be designed as a one-size-fits-all and governance regulation itself will be incomplete. Supervision can help fill in these gaps. For example, the Bank of England specifically mentions the importance of supervision of the governance arrangements of CCPs.²⁰³ Supervision and governance can therefore be seen as complements rather than as substitutes.

4.2. Level of residual discretion of the regulated actors

The second variable relates to the level of discretion prudential supervision leaves to the regulated actors to increase and decrease systemic risk. If the supervisor leaves important decisions to the regulated actors without close supervision, the governance of the regulated actors becomes an important part of the prudential framework. This section first discusses the supervisory approach in the case of asset managers and their funds, before turning to the supervision of CCPs.

In the UK, asset managers and their funds are supervised by the Financial Conduct Authority ('FCA') as NCA, which is responsible for both the conduct of business supervision and the prudential supervision. FCA's prudential supervision is guided by the FCA's statutory objectives of consumer protection, market integrity and competition²⁰⁴. The focus of the FCA's supervision is on the impact of the failure of the supervised firm on both customers and the integrity of the financial system.²⁰⁵

There is limited information made public on the exact scope of such supervision. However, it is clear that proactive prudential supervision is limited to a small subset of the firms under its supervision; dependent on the significance of the potential impact of the firm or group's failing on the market and customers.²⁰⁶ As a result, in practice, the

²⁰³ Bank of England, 'The Bank of England's Approach to the Supervision of Financial Market Infrastructures' (2013) 7.

²⁰⁴ Nausicaa Delfas, 'Speech 'Overview of the FCA prudential approach', 2015, <https://www.fca.org.uk/news/speeches/overview-fca-prudential-approach>

²⁰⁵ FCA, 'Business Plan 2018/19', 13.

²⁰⁶ For more detail, see FCA, 'FCA Mission: Approach to Supervision April 2019' <<https://www.fca.org.uk/publication/corporate/our-approach-supervision-final-report-feedback-statement.pdf>> accessed 1 January 2019; George Walker, Robert Purves and Michael Blair, *Financial Services Law* (Oxford University Press 2018) 277–278.

supervisory approach of the FCA entails that firms which are labelled as ‘low-risk’, are only being visited every few years. Supervision then will merely consist of assessing compliance with prudential norms, leaving substantial discretion to the regulated actors. In hedge funds, for example, we argued that managers can gain substantially from increasing risk due to performance-based compensation. This could potentially be problematic from a systemic risk perspective. As a result, in such context, governance interventions are a key complement to the prudential framework.

Turning to CCPs, NCAs supervise their day-to-day operations. In the UK, for example, the NCA is the Bank of England. Again, there is limited information on the exact scope of such supervision. In 2013, the Bank of England published its approach to financial market infrastructure supervision. This approach suggests that the Bank of England’s supervision is risk-based in nature. More specifically, the Bank of England prioritises its efforts on the basis of where the risks to the financial system are the greatest.²⁰⁷ In its risk assessment, the Bank of England considers the potential risks (both internal and external), the operational mitigants (e.g. governance, risk management and control, disaster recovery plans), financial mitigants (e.g. margin, default fund, and liquid funds), and structural mitigants (e.g. recovery and resolvability).²⁰⁸ Although CCPs maintain responsibility for satisfying the minimum standards under the regulatory regime, the Bank of England confirms that it will form its own judgement. The Bank of England first assesses – at least annually – the risks the supervised CCP presents to the financial system. This allows the Bank of England to determine the intensity of the supervision. The Bank of England also performs spot checks where necessary, either directly, or via external experts, either through information requests, or through on-site examinations. The bank intervenes early and pre-emptively in the case it identifies a material risk. Throughout the supervision, the bank actively engages with the CCP and periodically meets with its senior officers.²⁰⁹ Such approach suggests – at least on the books – that there might only be limited discretion left for the regulated actors. Indeed, a close supervisory relationship allocates the final discretion to decide ex-post on the exact content of the rules to the supervisor. This in turn leads to a decreased importance of governance interventions to direct the discretion of the regulated actors.

4.3. The locus of information

Finally, the identification and evaluation of systemic stability issues presents an enormous informational challenge for the public authorities. The size of the financial system alone illustrates the magnitude of the task.²¹⁰ For example, the European asset management industry managed EUR 25.2 trillion of assets in 2017, which amounted to a ratio of AUM to European GDP of 147%.²¹¹ Moreover, at the end of 2017, trade

²⁰⁷ Bank of England, ‘The Bank of England’s approach to the supervision of financial market infrastructures April 2013’, 3.

²⁰⁸ Bank of England, ‘The Bank of England’s approach to the supervision of financial market infrastructures April 2013’, 7-10.

²⁰⁹ Bank of England, ‘The Bank of England’s approach to the supervision of financial market infrastructures April 2013’, 11.

²¹⁰ For example, as calculated by Armour et al., the value of the claims in the financial system in the UK, the US, Germany, and Switzerland add up to more than the size of the domestic economy in terms of the Gross Domestic Product (GDP), see Armour and others (n 2) 82.

²¹¹ These numbers include both the discretionary mandates and the investment funds, see EFAMA, ‘Asset Management in Europe’ (2018) 3.

repositories reported a gross notional outstanding amount of over-the-counter and exchange-traded derivatives of EUR 660 trillion, with central clearing rates for all outstanding contracts around 27 per cent for credit derivatives and 58 per cent for interest rate derivatives.²¹²

Public authorities do not necessarily have access to the information, knowledge and resources necessary to assess the systemic risks involved. To some extent it is unavoidable that financial institutions have a better understanding of the risks of their operations than the prudential authorities.²¹³ For example, CCPs will have a better understanding of their exposure with respect to the portfolios they clear. Similarly, hedge funds will have a better understanding of the risks presented by their investment strategies. Moreover, financial innovations often cross regulatory classifications leaving public authorities constantly behind the curve.²¹⁴ In addition, firms might have incentives to increase the complexity of their operations in order to increase the informational asymmetry in their relationship with the prudential authorities.²¹⁵ Moreover, the resources available to public authorities are limited.²¹⁶

On the other hand, in some circumstances prudential authorities might actually have an informational advantage compared to financial institutions in order to assess the implications of ad hoc decisions on the system as a whole. For example, the prudential authorities might – at least in theory – be better placed to assess the impact of a haircut by CCPs on the other market participants than CCPs themselves. Similarly, regarding systemic risk in the asset management industry, the prudential authorities are potentially in a better position to assess the amount of leverage in the market generally or the illiquidity of a specific asset class.

However, for this to be true, prudential authorities must engage in a thorough monitoring of the stability of the financial system as a whole. However, the ESRB is not considered very effective in this regard.²¹⁷ In particular, in order to perform its tasks, the ESRB relies on access to information. Yet, the framework in place to provide the ESRB with the necessary data to perform its functions effectively turned out to be weak. More specifically, the ESRB heavily relies on other agencies to access relevant information. First, the ESRB relies on the information collected by the ECB through the Eurosystem.²¹⁸ Moreover, upon request of the ESRB's Secretariat, the ESAs should provide relevant information to the ESRB. If this is not available or provided, the ESRB can request information from national authorities, in particular supervisory authorities and national central banks. All institutions operate under a general obligation to provide the ESRB with the necessary information to fulfil its tasks.²¹⁹ In practice, the

²¹² ESMA, 'ESMA Annual Statistical Report EU Derivatives Markets 2018' ESMA 50-165-670.

²¹³ Lucian A Bebchuk and Holger Spamann, 'Regulating Bankers' Pay' (2009) 98 *Georgetown Law Journal* 247, 281; Henry T. C. Hu, 'Misunderstood Derivatives: The Causes of Informational Failure and the Promise of Regulatory Incrementalism' (1993) 102 *The Yale Law Journal* 1457, 1463.

²¹⁴ Awrey, 'Regulating Financial Innovation' (n 18) 274; Henry T. C. Hu, 'Swaps, The Modern Process of Financial Innovation and the Vulnerability of a Regulatory Paradigm' (1989) 138 *University of Pennsylvania Law Review* 333, 392–412.

²¹⁵ Omarova (n 20) 71; Thom Wetzler, 'In Two Minds: The Governance of Ring-Fenced Banks' [2018] *Journal of Corporate Law Studies* 1, 15.

²¹⁶ Armour and others (n 2) 82.

²¹⁷ See for example as argued by Lastra (n 10) 396.

²¹⁸ The monetary authority in the eurozone, which consists of the ECB and the national central banks of those member states that adopted the euro.

²¹⁹ Article 15 ESRB Regulation; Commission, 'Proposal for a Regulation of the European Parliament and of the Council on Community macro prudential oversight of the financial system and establishing a European Systemic Risk Board' (Explanatory Memorandum) COM(2009) 499 final, 6.

system is leading to delays on information requests, irregular data flows and insufficient access.²²⁰

ESMA, in contrast, has significantly increased its data capacity as well as its ability to assess the data and identify risks.²²¹ Although the data collection mechanism under the ESMA Regulation is rather limited and convoluted²²², ESMA has developed itself as a central data hub through empowerments in sectoral EU financial market regulation as well as through ESMA's own-initiative activities.²²³ For example, ESMA is a central node in the data collection regarding OTC derivatives.²²⁴ ESMA has also developed its risk assessment capacity. This is for example illustrated by the launching of its liquidity assessment of bonds under the Markets in Financial Instruments Directive (MiFID II) and Regulation (MiFIR).²²⁵ The ESAs Proposals 2017 want to improve ESMA's data function even further, for example by empowering ESMA to host a data storage facility related to financial stability risks.

Governance interventions can complement the current prudential framework by mitigating the identified informational challenges in at least two ways. First, as supervisors do not necessarily have access to all the relevant information to perform their supervisory function, they rely on the regulated actors to provide the necessary information to the supervisor. Governance interventions could avoid misrepresentation or misreporting of information in order to maximise shareholder value by aligning the incentives of managers with the public interest. Second, when supervisors have access to superior information, switching the responsibility of the decision from the managers

²²⁰ A problem also identified by the High-Level Group on the ESRB Review, see High-Level Group on the ESRB Review, 'Contribution to the Review of the ESRB March 2013'; Lastra (n 10) 392.

²²¹ For a detailed account of ESMA as a 'Burgeoning Data Hub' see Moloney, *The Age of ESMA: Governing EU Financial Markets* (n 53) 192–199.

²²² The process operates as follows. First, ESMA can request information from the national competent authorities. If the information is not available or if the national competent authorities do not provide the information in a timely fashion, the ESAs can request information from other supervisory authorities, the ministry responsible for finance, the national central bank or the statistical office of the Member State concerned. Moreover, if such information is not available or made available in a timely fashion, the ESAs can request information from the market participants directly (article 35 ESMA Regulation).

²²³ In its Supervisory Convergence Work Programme ESMA explicitly states that it wants to make 'data and its use more robust and consistent by developing and further clarifying reporting methodologies and providing guidance to ensure complete and high-quality data: ESMA will continue to strive for a comprehensive approach to data, supported by the newly created Data Standing Committee. The experience with regard to the EMIR data quality action plan will be improved and further extended to other reporting regimes, in particular under MiFIR and AIFMD. The implementation of MiFID II/MiFIR has increased both the volume and quality of data received by ESMA to fulfil its coordination and implementation role under various reporting requirements. ESMA will work on further improving the functioning of those systems, including double-volume cap, transparency and systematic internaliser test calculations. Concerning quality of data reported under EMIR, the currently ongoing peer review is expected to have real added value to convergence in supervisory practices. Regarding AIFMD, the further completion of the available data will allow ESMA and NCAs to concentrate on the reported content and provide clarifications to the reporting regime', see ESMA, 'Supervisory Convergence Work Programme 6 February 2019' ESMA42-114-647, 11-12.

²²⁴ For example, ESMA hosts the 'single EU access point' for the NCAs' access to data from trade repositories, holds data directly reported by derivatives market participants under their reporting and notification obligations, and hosts different trade repositories, for more detail see Moloney, *The Age of ESMA: Governing EU Financial Markets* (n 53) 194.

²²⁵ ESMA, 'Press Release 2 May 2018 'ESMA launches bond liquidity system under MiFID II'', <https://www.esma.europa.eu/press-news/esma-news/esma-launches-bond-liquidity-system-under-mifid-ii>

and their shareholders to the prudential authorities could provide a useful tool to ensure systemic stability.

In sum, the above analysis lays bare important gaps in prudential regulation and supervision, which imply a role for the regulation of the governance of systemically important firms in complementing the already existing prudential framework. Governance norms differ from traditional 'external' prudential norms in that they are less affected by macro-economic change and can therefore be stipulated at the EU-level in a more complete manner. This reduces the opportunities for supervisory competition regarding prudential requirements at the level of the NCAs. Moreover, well-designed governance interventions can encourage managers across the EU to fill in the gaps in the prudential framework in line with prudential goals and, therefore, complement the gap-filling role of the prudential supervisors. This is especially important in the case of significant information disadvantages of the supervisor and in the case of a high level of residual discretion of the regulated actors due to weak supervision (e.g. because of limited financial resources). The next chapter will investigate what such governance interventions might look like in our case studies.

Chapter VI. The governance analysis: policy recommendations

Chapter VI. The governance analysis: policy recommendations.....	123
1. The governance analysis: asset managers and their funds.....	124
1.1. The governance framework.....	124
1.1.1. The relationship between asset managers and the investors	125
1.1.2. The multi-layered governance problem	126
1.2. The perverse incentives case studies	128
1.2.1. UK corporate bond index fund.....	128
1.2.2. Long-short equity alternative investment fund	130
1.3. Policy recommendations	131
1.3.1. UK corporate bond index fund.....	131
1.3.2. Long-short equity fund.....	133
2. The governance analysis: CCPs.....	136
2.1. The governance framework.....	136
2.2. The perverse incentives	137
2.3. Policy recommendations	139

The limits of the current prudential framework – identified in chapter five – point the way to a role for corporate governance regulation. As argued in chapter one, when the regulatory protection of externalities is shaky and the costs of finding or creating loopholes are, therefore, low, the benefits for managers of exploiting the loopholes should be constrained. More specifically, it follows from the analysis in the preceding chapters that certain non-bank financial institutions may, like banks, also be cases where the general approach to corporate governance—that is, shareholder value maximisation—is inappropriate. However, it is rather less clear what should be put in its place. Indeed, the discussion in the governance literature of systemically important *banks* is justified by reference to the peculiarities of banks’ financial structure. Yet, the potential for systemic externalities in non-bank financial institutions arises in different ways. Therefore, it is unclear whether and to what extent the prescriptions of the bank governance literature may be extrapolated to non-bank SIFIs.

This chapter engages in a ‘governance’ or ‘agent-level’ analysis and identifies how the way agents are constrained in a financial institution interacts with the systemic concerns. Assuming a systemically important business model, the interaction could be neutral, detrimental, or beneficial from a systemic risk point of view. The interaction is neutral if a financial institution constrains its agents in such a way that perfectly aligns the agent’s incentives with the (perverse) business model. This is because the agent’s incentives will perfectly parallel the systemic problems in the business model. The interaction is detrimental if a business model that stands to benefit from externalities is combined with a corporate governance system that creates even stronger perverse incentives for the agent to exacerbate the problems inherent in the business model.

Finally, the interaction is beneficial if the financial institution constrains the agent in such a way that reduces the agent's incentives to create systemic externalities more than would be expected based solely on the principal-level incentives.

The governance analysis proceeds in three steps. First, we identify how the agent's actions are constrained within the business model. In other words, we establish the functioning of the corporate governance framework within the financial institution in question. In a second step, we determine the incentives of the agents with regard to both the business model and systemic risk considerations. Put another way, this is whether the constraints reduce agency costs between the agent and the business as well as the agent and systemic risk considerations. Finally, policy recommendations are provided based on the identified incentives. Increasingly, lawmakers rely on corporate governance as a complement to traditional prudential regulation, leading to some authors arguing that a new European company law statute for financial institutions is emerging.¹ In essence, we argue that in CCPs and in funds – exemplified by a UK corporate bond index fund – some responsibility for applying crisis management tools should switch from the managers to the prudential authorities. Moreover, we advocate in favour of a recalibration of the regulation of performance fees in funds, as illustrated by our analysis of a long-short equity fund. The discussion below first engages in the governance analysis for asset managers and their funds, before discussing CCPs.

1. The governance analysis: asset managers and their funds

Chapter three examined the systemic concerns regarding the asset management industry and certain types of funds in particular. Chapter five then argued that the 'external' prudential norms governing the discussed funds are incomplete and supervision is limited. This section investigates whether governance regulation can help fill in the gaps left by the traditional prudential framework. More specifically, the analysis discusses the governance of two funds – examined in chapter three – that raise systemic concerns, namely a UK corporate bond index fund and a long-short equity alternative investment fund. In both funds the analysis below shows that the mechanisms used to mitigate agency costs in the investor-manager relationship could exacerbate the systemic concerns identified in chapter three. The analysis first discusses the governance framework of funds in general, before examining the incentives of the agents in a UK corporate bond index fund and a long-short equity alternative investment fund. The analysis concludes with policy recommendations.

1.1. The governance framework

This section discusses the governance framework in funds. It first examines the agency relationship between the asset manager and the fund's investors, before it touches upon the multi-layered nature of the governance framework.

¹ Danny Busch, Guido Ferrarini and Gerard van Solinge, 'Governing Financial Institutions. Law and Regulation, Conduct and Culture' in Danny Busch, Guido Ferrarini and Gerard van Solinge (eds), *Governance of financial institutions* (First Edition, Oxford University Press 2019) 13; Kitty Lieverse and Claartje Bulten, 'Corporate Law Versus Financial Regulatory Rules: The Impact on Managing Directors and Shareholders of Banks' in Danny Busch, Guido Ferrarini and Gerard van Solinge (eds), *Governance of financial institutions* (First Edition, Oxford University Press 2019).

1.1.1. The relationship between asset managers and the investors

The relationship between asset managers and their funds is governed by an agreement whereby the asset management company agrees to supply the operational and administrative services in return for the sole authority to manage the investments of the fund. This creates an agency relationship between the asset manager and the investors in the fund. More specifically, the asset manager ('the agent') manages the fund's assets to the benefit of the investors in the fund ('the principal').

A possible conflict of interest arises between the asset manager and the investors, as the asset manager ('the agent') is in charge of the decision-making in the fund, but does not necessarily have incentives to further the interests of the investors ('the principal'). Investors provide the capital to the fund and in return receive shares or units in the fund. The interests of the asset manager might conflict with the interests of the fund and its investors. Private parties will therefore find it desirable to put governance mechanisms in place to convince the investors that the fund's decisions will – within the boundaries of discretion left by the regulator for making those decisions – consider the investors' interests and not the private benefits of the asset managers.² When these governance mechanisms do not convince the investors regarding the protection of their interests they will increase the price of the input provided.

The governance mechanisms used in funds differ from those used in regular public companies.³ In Europe, for example, the oversight role of the board of directors – a classic feature of general corporate governance – is underdeveloped, if not non-existent⁴, in funds. In the US, in contrast, the board is considered – at least in theory⁵ – to play a role in the governance of funds and is tasked with monitoring the management in the interest of the shareholders as independent 'watchdog'.⁶ The policy recommendations – as formulated below – focus on the European market and will, therefore, not consider the effectiveness of the board of directors as governance mechanism in funds.

In most investment funds, investors have strong exit rights, which are considered part of the governance framework in funds.⁷ Indeed, in contrast to investors in ordinary companies – where shareholders can sell their shares, but do not have claims on the

² For similar definitions in the context of general corporate governance, see Jonathan R Macey, *Corporate Governance: Promises Kept, Promises Broken* (Princeton University Press 2008); Andrei Shleifer and Robert W Vishny, 'A Survey of Corporate Governance' (1997) 52 *The Journal of Finance* 737.

³ For hedge fund governance see Houman Shadab, 'Hedge Fund Governance' (2013) 19 *Stanford Journal of Law, Business & Finance* 141, 147.

⁴ Funds are not necessarily organised as corporations, but for instance often take the form of a trust or partnership.

⁵ The effectiveness of the board of directors of funds to protect the shareholders' interests is widely contested in the literature. The arguments in the literature boil down to the fact that the board of directors lack the necessary tools to perform such a function, see John Morley, 'The Separation of Funds and Managers: A Theory of Investment Fund Structure and Regulation' (2014) 123 *Yale Law Journal* 1228; Robert F Radin and William B Stevenson, 'Comparing Mutual Fund Governance and Corporate Governance' (2006) 14 *Corporate Governance: An International Review* 367.

⁶ US Supreme Court, *Burks v. Lasker*, 441 US 471 (1979); under Section 10 of the US Investment Company Act of 1940, an investment company must have 'a board of directors more than 60 per centum of the members of which are persons who are interested persons of such registered company', see 15 U.S. Code § 80a-10. Affiliations or interest of directors, officers, and employees.

⁷ Morley (n 5).

underlying assets, investors in (open-ended) funds have a right to convert their share back into cash. Open-ended mutual funds, for example⁸, give investors redemption rights.⁹ Moreover, investors seem to neglect any control rights of their own funds – if they have any – and seem to prefer ‘exit’ over ‘voice’.¹⁰ In private equity funds, the exit rights are weaker and consist of guaranteed liquidation of the fund after a fixed period.¹¹ As a result, investors have higher control rights compared to investors in for example hedge funds.¹²

The governance mechanisms will differ across fund types depending upon the features of the fund. Take the example of redemption rights. If a fund has strong redemption rights, such an easy ‘exit’ option for investors will put fund managers under pressure to keep investors from withdrawing money from the fund. If a fund has weaker redemption rights, however, redemption rights are often combined with other governance mechanisms – such as performance compensation or increased control rights – to incentivise managers to maximise the returns for investors.

Regulators have also intervened in the governance of funds in order to protect investors. In the EU, for example, the regulation for Undertakings for Collective Investment in Transferable Securities (‘UCITS’) and Alternative Investment Fund Managers (‘AIFM’) create direct duties owed by the asset manager to the fund’s investors.¹³ The AIFM directive creates a duty for the AIFM to – at all times – ‘*act in the best interests of the AIFs or the investors of the AIFs they manage and the integrity of the market*’.¹⁴ In the UCITS directive, for instance, UCITS are granted the right to temporarily suspend the redemption of its units, ‘*where suspension is justified having regard to the interests of the unit-holders*’.¹⁵

1.1.2. The multi-layered governance problem

Depending on the institutional design of asset managers and their funds, additional agency relationships should be added to the governance structure to paint a complete picture of the problem. In particular, the ‘asset manager’ (‘M1’) could actually be a composite of multiple governance layers. Large asset managers for instance will be organised as asset management companies (‘AMC’) and will be managed by their own management (M2). The M2 of the AMC (or M1) will manage the asset management business to the benefit of the AMC’s shareholders.¹⁶ This creates a distinct agency

⁸ Hedge funds usually give their investors redemption rights, but the lock-up periods and other modalities vary and depend on the specific fund.

⁹ For example, under the UCITS regime, UCITS must redeem their units at the request of a unitholder, see Article 84 (1) UCITS-Directive.

¹⁰ Albert O Hirschman, *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States* (Harvard University Press 1970); Morley (n 5) 1252–1253.

¹¹ Morley (n 5) 1245–1246.

¹² Morley (n 5) 1255.

¹³ These ‘direct duties’ are in fact public law, and so enforceable by regulators, rather than private law duties enforceable by investors.

¹⁴ Article 12 (1) (b) AIFM Directive.

¹⁵ Article 84 UCITS Directive.

¹⁶ In other words, asset managers serve two masters: the investors of the funds they manage and their own shareholders. In other words, asset managers serve two masters: the investors of the funds they manage and their own shareholders. Bogle, founder and former chairman of the Vanguard Group, vividly opposes the structure and advocates for a mutualisation of funds by having the funds own the stock of the asset managers. Such mutualisation would allow the managers to solely serve the interests of the owners-

relationship between M2 ('the agent') and the AMC's shareholders ('the principal'). M2 can then further delegate decision-making to the employees of the asset management company. For example, a fund's portfolio manager will act as the agent of the AMC or M1 in managing the fund's investment to the benefit of the investors.¹⁷ Every level of delegation creates distinct agency relationships with distinct governance levers addressing possible agency problems. The level of delegation and in particular the layered structure of such delegation is a matter of institutional detail and will vary across different funds.

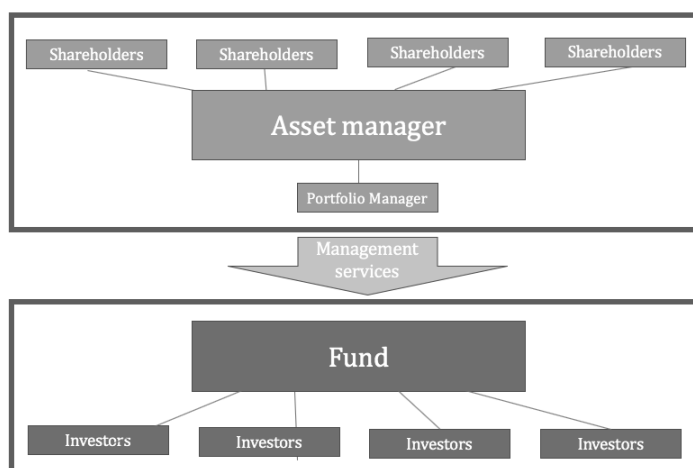


Figure 1 Multi-layered governance structure of funds

Appreciating the complexity of this multi-layered governance structure makes clear how difficult it is to determine the scope of the governance debate in the asset management industry. More specifically, it poses the question whether the discussion needs to focus on the incentives of those who make the actual investment decisions (i.e. the portfolio manager managing the fund) or on the incentives of the person who appoints them (i.e. the asset management company itself).¹⁸ In other words, the multi-layered problem relates to the debate whether governance mechanisms should be applied top-down or bottom-up. This debate boils down to a discussion on how incentives trickle through the institutional design of the organisation.

The problem generated by this multi-layered structure is distinct from the problem that is the focus of this thesis, i.e. that related to the misalignment between private governance mechanisms and systemic risk considerations. For the present purposes, it is sufficient to be aware that the multi-layered aspect of the governance in

investors of the funds, see John C Bogle, *Character Counts: The Creation and Building of The Vanguard Group* (McGraw Hill Professional 2002) 4–5.

¹⁷ A paper by Ibert, Kaniel, and Van Nieuwerburgh, for example, analyses the relationship between the actual fund manager and investors. More specifically, it provides empirical evidence related to the determinants of manager compensation. This focus is unique, as most empirical studies examine the relationship between investors and the management company, see Markus Ibert and others, 'Are Mutual Fund Managers Paid for Investment Skill?' (2018) 31 *The Review of Financial Studies* 715.

¹⁸ As stipulated by Armour et al. 'By "corporate governance", commentators mean the mechanisms by which managers are selected, motivated, and rendered accountable to shareholders, as well as those by which managers oversee the activities of other employees.', see John Armour and others, *Principles of Financial Regulation* (Oxford University Press 2016) 371.

the asset management industry implies that different governance levers exist at the different levels of the organisation. It will be the interaction between the different layers that will ultimately determine the composite incentive structure in place in a specific case. This problem is of greater or lesser significance depending on the institutional design of the asset manager and their funds. The analysis below will therefore abstract away from the multi-layered problem and focus on the incentives problem in the relationship between the asset manager (M1) and the fund investors. The analysis does not claim to provide a comprehensive analysis of the governance problems in asset managers and their fund. However, it consists of a suggestion of problems and illustrates how and the extent to which governance mechanism can make a difference in managing systemic risk.

1.2. The perverse incentives case studies

1.2.1. UK corporate bond index fund

As discussed above, a UK corporate bond index fund is vulnerable to systemic runs by investors, potentially leading to spill-overs to other parts of the financial system. The question addressed in this section is how corporate governance mechanisms addressing the manager (M1)-investors agency problem interact with the systemic risk concerns.

Index funds have a relatively predictable investment strategy, which limits the managerial discretion and the resulting agency costs with regard to asset allocation and portfolio decisions in the investor-manager relationship.¹⁹ These decisions are indeed severely limited in index funds, as managers are expected to track the index as closely as possible. Moreover, managers' incentives are further aligned with investors' interests through compensation calculated as a percentage of the AUM. No effort is needed from the manager to actively find mispriced securities in order to increase returns. The low management fees mechanically increase the returns on the AUM for investors.

The interaction between these governance mechanisms and the systemic concerns – due to the possible liquidity mismatch between the fund's investment in corporate bonds and the redemption rights of its investors – will vary over time. During good times, such governance arrangements bring about few systemic concerns. Indeed, strategies applied by managers to increase AUM – and thereby increase their compensation received – are unlikely to significantly increase systemic risk presented by these funds. For example, their discretionary mandate limits investments to securities included in the index. As a result, asset managers cannot increase the AUM – and therefore their fees – by engaging in risk-seeking, for example through increased investment in illiquid assets relative to the redemption terms.

During times of distress, however, the management of liquidity problems by funds can be essential to maintain systemic stability and the governance framework does not provide managers with appropriate incentives. In the first place, investment constraints can lead to a mechanical approach to security selection in index funds based on the securities included in the index, which increases correlated selling of those securities. More specifically, in the case of a run on index bond funds, such mechanical approach

¹⁹ A study by Almazan et al view investment constraints as a monitoring mechanisms to reduce principal-agent costs, see Andres Almazan and others, 'Why Constrain Your Mutual Fund Manager?' (2004) 73 *Journal of Financial Economics* 289.

will lead to managers dumping similar securities at similar times²⁰ and could therefore have a procyclical effect.²¹ Indeed, asset managers will buy and sell these securities independent of their assessment of the value of the securities bought. For example, imagine that an asset manager believes that the corporate bonds in the energy sector are overvalued. The manager of an index fund does not have a mandate to sell off these overvalued bonds first in the case of redemption requests, as that might lead to an increased tracking error on the index. In good times, increased investor demand will result in asset managers buying the securities included in the index. In bad times, massive redemptions will lead asset managers to sell the securities in the index. In the case of a run on index bond funds, this will lead to funds dumping similar securities at similar times. These correlated sales could – as a herd – impact prices and market volatility in the bond market with potential spillover effects on the rest of the economy. In short, while limited managerial discretion could reduce agency costs of the delegation of portfolio management, in bad times it could lead to rigidity and or synchronisation in asset managers’ decision-making.

The strategic use of ex-post liquidity management tools could help alleviate financial instability issues arising from such ‘dumping’ of securities on the market. Indeed, there are a variety of tools available, such as redemption gates, redemption in kind, side pockets, notice periods, or suspension of redemption. The types of tools available to funds differ across member states. The only tool available in every EU member state is the right to suspend redemption.²² The UCITS-Directive explicitly includes a right for UCITS to temporarily suspend redemption in exceptional cases and where necessary to safeguard the interests of the unitholders, in accordance with applicable national law, the fund rules or the instruments of incorporation of the investment company.²³ Suspension of redemption allows time for an orderly liquidation of positions in order to avoid selling assets below true value.²⁴ During the financial crisis, for example, suspensions were necessary because it was impossible to obtain fair value for certain securities.²⁵ Moreover, it can give supervisors and managers the opportunity to explain the current market conditions to investors and prevent a panic.²⁶

However, the compensation arrangements do not provide appropriate incentives – from a systemic risk perspective – to prevent such systemic correlated sales through the appropriate use of ex-post liquidity management tools. The decision to suspend redemption for example is in the first place the responsibility of the asset managers and their agents, who have the discretionary power to assess the necessity of such measure.²⁷ However, compensation calculated based on the AUM does not provide for

²⁰ Alistair Jones, ‘Schroders. The Hidden Risks of Going Passive’ <<http://www.schroders.com/de/sysglobalassets/digital/insights/pdfs/hidden-risk-of-going-passive-july-2014.pdf>> accessed 10 October 2018.

²¹ Jones (n 20).

²² AMIC/EFAMA, ‘Managing Fund Liquidity Risk in Europe - an AMIC/EFAMA Report April 2016’ (2016) 24; ESRB, ‘Recommendation of the European Systemic Risk Board of 7 December 2017 on Liquidity and Leverage Risks in Investment Funds’ (Recommendation) ESRB/2017/6 17; OICV-IOSCO, ‘Liquidity Management Tools in Collective Investment Schemes: Results from an IOSCO Committee 5 Survey to Members’ (2015) 4.

²³ Article 84 (2) UCITS-Directive.

²⁴ AMIC/EFAMA (n 22) 18.

²⁵ AMIC/EFAMA (n 22) 18.

²⁶ ESRB (n 22) 16.

²⁷ AMIC/EFAMA (n 22) 18; ESRB (n 22) 17.

appropriate incentives for three reasons. Firstly, as managers are repeat players, reputational concerns could result in the underuse of suspension of redemption in times of crisis. Indeed, investors could attribute the need to suspend redemption to poor liquidity management by the manager rather than systemic stress, leading to lasting reputational damage for the manager. Secondly, managers could fear that suspension of redemption in one fund could result in investors losing confidence in other funds under their management.²⁸ Finally, managers will only apply suspension in the interest of its unitholders, as is also explicitly stipulated in the UCITS-Directive. Where unitholders are able to externalise the costs of a large-scale redemption on the financial stability, the interests of the unitholders will not align with the interests of the system as a whole.²⁹

In addition to the perverse incentives provided by the compensation arrangements, managers might not have access to the necessary information to assess the macroprudential situation in the market when deciding on the need for suspension. For example, the impact of the sale of corporate bonds on the market will depend on both the liquidity of the corporate bond market as well as correlated sales by other actors in the market. Prudential authorities – in theory – have better access to such macroprudential information. As discussed above, ESMA has launched a liquidity assessment of bonds under the Markets in Financial Instruments Directive (MiFID II) and Regulation (MiFIR).³⁰

1.2.2. Long-short equity alternative investment fund

The systemic concerns in a long-short equity alternative investment fund – as discussed in chapter three – results from the use of leverage. In contrast to the corporate bond index fund, the managerial discretion to make portfolio decisions is much higher. Correspondingly, the redemption rights of investors are more restricted than in UK corporate bond index funds, as the fund can apply a variety of short-term restrictions on the investors' right to redeem. This gives managers more freedom to make portfolio decisions without the concern that investors will suddenly redeem the capital.³¹ In order to manage the agency costs resulting from the managerial freedom, the relative lock-in of the capital comes with performance compensation based on the profits above the HWM. This should incentivise the managers to maximise returns in line with investors' interests.

While performance fees might mitigate agency costs in the investor-manager relationship, they can create perverse incentives from a systemic stability perspective. More specifically, performance fees charged by the fund create an asymmetric pay-off structure for managers. Fund managers receive an unlimited share of the upside of risky investments (17 per cent of all the profits above the HWM), while the 2 per cent

²⁸ ESRB (n 22) 17.

²⁹ ESRB (n 22) 17.

³⁰ ESMA, 'Press Release 2 May 2018 'ESMA launches bond liquidity system under MiFID II'', <https://www.esma.europa.eu/press-news/esma-news/esma-launches-bond-liquidity-system-under-mifid-ii>

³¹ Agarwal et al find that hedge funds with a higher degree of managerial discretion, proxied by longer lockup, notice and redemption periods are associated with superior performance for investors, see Vikas Agarwal, Naveen D Daniel and Narayan Y Naik, 'Role of Managerial Incentives and Discretion in Hedge Fund Performance' (2009) 64 *Journal of Finance* 2221.

management fees function as a floor on the downside, allowing asset managers to cover (at least part of) their costs even in the case of severe losses.³² The closer to its HWM, the greater the incentive of the fund manager to increase risk to trigger the performance fees.³³

This asymmetric structure shows similarities with the heavily criticized pay-off structure in banking prior to the crisis. Bebchuk, Cohen, and Spamann³⁴ find that bank executives – even though they suffered significant losses on their bank holdings during the crisis – were able to cash out significant amounts of performance-based compensation before their firm collapsed, leaving their bottom-line pay-offs significantly positive. They argue that such compensation structure gave incentives to increase short-term profits in order to receive large amounts of performance compensation, even though this increased the probability of large losses over the longer period. In a long-short equity alternative investment fund the payment structure could provide similar benefits for managers. In the good years, the managers can cash in on the entire upside of profits above the HWM. In bad times, the losses are not borne by the managers, but by the investors.³⁵ Moreover, the management fees – to some extent – provide a floor to the losses, ensuring that the costs of the asset management business are covered.

1.3. Policy recommendations

Given the limits of the prudential framework and the perverse incentives of agents identified above, governance interventions could help gain traction to mitigate systemic risk in the asset management industry. This section provides policy recommendations for improvement of the current governance regime for the stylised examples discussed in the previous section.

1.3.1. UK corporate bond index fund

As argued above, the governance arrangements in our example of a UK corporate bond index fund – investment constraints and management fees – provide perverse incentives in times of distress. Moreover, managers do not necessarily have access to the information necessary to make the right decisions from a systemic risk perspective during distress. Therefore, this thesis argues that, in times of systemic distress, the responsibility for applying ex-post liquidity management tools, and suspension more particularly, should switch from the managers of the fund to the prudential authorities. Such a governance strategy is also expressly envisioned in both the UCITS-Directive and

³² H Kent Baker, Greg Filbeck and Victor Ricciardi, *Financial Behavior: Players, Services, Products, and Markets* (2017) 145.

³³ Yingcong Lan, Neng Wang and Jinqiang Yang, 'The Economics of Hedge Funds: Alpha, Fees, Leverage, and Valuation' [2011] NBER Working Paper Series 1.

³⁴ Lucian Bebchuk, Alma Cohen and Holger Spamann, 'The Wages of Failure: Executive Compensation at Bear Stearns and Lehman 2000-2008' (2010) 27 *Yale journal on regulation* 257.

³⁵ To be sure, the structure of the performance fees charged by hedge funds has increasingly come under pressure. In this context, some hedge funds offer clawbacks, where a share of paid-out performance fees can be retrieved by investors in a loss scenario. However, such clawbacks are not widespread, see a study by AIMA Alternative Investment Management Association (AIMA), 'In Concert Exploring the Alignment of Interests between Hedge Fund Managers and Investors' [2016] AIMA paper.

the AIFM-Directive. More specifically, UCITS' home Member State can allow the NCAs³⁶ to require the suspension of redemption in the interest of the unitholders or of the public.³⁷ Under the AIFM-Directive, in turn, the competent authorities should be given the power to require the suspension of the issue, repurchase or redemption of units in the interest of the unitholders or of the public.³⁸ The powers included in these provisions are of a microprudential nature insofar as they relate to 'the interests of unitholders'. However, the 'public interest' component opens the door to interventions of a macroprudential nature as well. There is no harmonised definition of 'public interest', but it is highly plausible that financial stability is captured.³⁹ We argue that such interpretation of the EU rules will help gain traction to align fund governance with prudential goals. In other words, in the case a systemic situation arises, the NCAs should intervene in the governance of funds in the interest of financial stability.

Such governance solution has similarities to the 'golden share' proposal by Omarova in the context of banks. Omarova proposes an even more radical reconfiguration by giving the federal government – as holder of a 'golden share' – a seat on the board of each systemically important banking organisation with direct but conditional management rights. At all times, such directors should have certain 'dormant' rights, e.g. to approve risk policies. When there is a higher likelihood of increasing systemic risk, the special director gets more intrusive rights to, for example, veto or slow down certain activities.⁴⁰

A governance solution to the identified problem is preferable over a hard and fast rule, as adopted in the US for money market funds.⁴¹ Under the new rules, the board of the money market fund can impose a redemption fee of up to 2 per cent or suspend the right of redemption temporarily, if the fund's weekly liquid assets fall below 30 per cent of its total assets.⁴² Money market funds must impose a liquidity fee if the fund's weekly liquid assets fall below 10 per cent of its total assets, unless the majority of the (independent) board decides that the fee is not in the best interests of the fund.⁴³

Such a stringent rule based on the liquidity of the assets of an individual fund is by its very nature microprudential and does not consider the macroprudential consequences of such decision. Moreover, a hard and fast rule can even incite a run, as investors might be encouraged to redeem at the first indication that a fund will trigger

³⁶ In Germany, for example, BaFin is empowered to order the suspension of redemption of fund units in the interests of investors or the public, see IMF, 'IMF Country Report Germany - Fund Management: Regulation, Supervision and Systemic Risk Monitoring - Technical Note' (2016) IMF Country Report No. 16/193.

³⁷ Article 84 (2) UCITS-Directive.

³⁸ Article 46 (2) (j) AIFM-Directive.

³⁹ ESRB (n 22) 18.

⁴⁰ Saule T Omarova, 'Bank Governance and Systemic Stability: The 'Golden Share' Approach' (2017) 68 Alabama Law Review 1029.

⁴¹ In 2014, the SEC adopted new rules for money market funds to 'address risks of investor runs in money market funds, while preserving the benefits of the funds', see SEC, 'Press Release - SEC Adopts Money Market Fund Reform Rules' (2014) <<https://www.sec.gov/news/press-release/2014-143>> accessed 16 December 2019.

⁴² 17 CFR §270.2a-7 (c)(2)(i)

⁴³ 17 CFR §270.2a-7 (c)(2)(ii) stipulates that 'if, at the end of a business day, the money market fund has invested less than ten percent of its total assets in weekly liquid assets, the fund must institute a liquidity fee, effective as of the beginning of the next business day, as described in paragraphs (c)(2)(ii)(A) and (B) of this section, unless the fund's board of directors, including a majority of the directors who are not interested persons of the fund, determines that imposing the fee is not in the best interests of the fund'

the threshold and a fee or gate might be triggered.⁴⁴ Transferring a discretionary power to decide on redemption limitations to the prudential authorities, however, can prevent investors anticipating an ex-ante adopted liquidity limit as well as can ensure that the system-wide consequences are considered.

Interestingly, during the Covid-19 crisis, the Federal Reserve avoided the hard and fast rule imposed on money market funds through the use of their discretionary powers. More specifically, money market funds were hit by large redemptions requests from investors looking for safety. Some funds approached the 30 per cent regulatory threshold, which would make the imposition of redemption fees and gates possible. The Federal Reserve, however, intervened by inserting liquidity into the market by extending loans to dealers to purchase assets from money market funds.⁴⁵

Although the discussed governance solution could mitigate the informational and perverse incentives problems identified, it does not address the regulatory competition problem, as the decision-making responsibility is allocated to the NCAs. ESMA's supervisory convergence powers could therefore be usefully employed in this area to create a level playing field amongst member states, for example through the issuance of guidelines on its application (e.g. by developing a uniform definition of what is considered public interest). This would not only lead to a more harmonised regime reducing supervisory competition, but could also help establish suspension as a tool to mitigate systemic risk.⁴⁶ Moreover, proposals to grant ESMA direct supervisory powers over asset managers and their funds would further eliminate regulatory competition.

1.3.2. Long-short equity fund

As discussed, hedge funds manage the agency problems in the investor-manager relationship by awarding managers performance compensation based on the profits above the HWM. This should incentivise the managers to maximise returns in line with investors' interests. As argued above, performance fees create an asymmetric pay-off structure for managers, which is detrimental for systemic stability.

The 2014 UCITS V reforms introduced operating rules regarding remuneration policies and practices.⁴⁷ Moreover, ESMA has issued detailed guidelines on sound remuneration under the UCITS-Directive.⁴⁸ The remuneration policies and practices apply to staff whose activities have a material impact on the risk profile of the management company or the managed UCITS.⁴⁹ In general, management companies are required to have remuneration policies and practices in place that are consistent with, and promote, sound and effective risk management. The remuneration policies and practices should not encourage risk-taking inconsistent with the risk profiles, rules or

⁴⁴ See for a more detailed evaluation of money market fund reform proposals, see Samuel Hanson, David Scharfstein and Adi Sunderam, 'An Evaluation of Money Market Fund Reform Proposals' (2015) 63 IMF Economic Review 984.

⁴⁵ For a detailed account, see Egemen Eren, Andreas Schrimpf and Vladyslav Sushko, 'US Dollar Funding Markets during the Covid-19 Crisis – the Money Market Fund Turmoil' [2020] BIS Bulletin.

⁴⁶ ESRB (n 22) 18.

⁴⁷ Article 14a and 14b UCITS-Directive.

⁴⁸ ESMA 'Guidelines on sound remuneration policies under the UCITS Directive' (Guidelines) ESMA/2016/575.

⁴⁹ Article 14a (3) UCITS-Directive; ESMA 'Guidelines on sound remuneration policies under the UCITS Directive' (Guidelines) ESMA/2016/575, 3, https://www.esma.europa.eu/sites/default/files/library/2016-575_ucits_remuneration_guidelines.pdf.

instruments of incorporation of the UCITS under their management nor impair compliance with the management company's duty to act in the UCITS' best interest.⁵⁰ The UCITS-Directive includes remuneration principles that the management company needs to comply with to the extent appropriate taking into account its size, internal organisation and the nature, scope and complexity of their activities.⁵¹ For example, the period of assessment of performance with respect to the performance-linked component of the remuneration must be appropriate to the holding period recommended to the UCITS' investors in order to ensure that the assessment process is based on the longer-term performance of the UCITS and its investment risks.⁵² Another example is the requirement that a substantial portion of the variable component is deferred.⁵³ Significant management companies – in terms of their size or of the size of the UCITS under management, their internal organisation and the nature, scope and complexity of their activities – must establish a remuneration committee. The remuneration committee needs to consider the long-term interest of investors and other stakeholders and the public interest.⁵⁴

A similar regime was adopted under the AIFM-Directive. Indeed, AIFMs must comply with a detailed remuneration regime. More specifically, the remuneration of those categories of staff whose professional activities materially impact the risk profile of the AIFMs or of the AIFs they manage, should be consistent with and promote sound and effective risk management.⁵⁵ A similar set of principles apply as stipulated in the UCITS-Directive.⁵⁶ ESMA has adopted a detailed set of remuneration guidelines.⁵⁷

Given the perverse incentives generated by the 2/20-kind of payments, we propose two changes to the current regime. First, we argue in favour of expanding the scope of the payments covered by the remuneration rules under the AIFM-Directive and UCITS-Directive. The current rules are, to a great extent, copied and pasted from the remuneration rules in banking.⁵⁸ However, where a bank contributes to systemic risk through strategies involving the investment of their own assets, asset managers manage assets for the benefit of the fund's investors, which adds an additional layer to the governance structure. As a result, in order to manage decision-making in the asset management industry, the interaction between the asset manager and its investors must be considered in addition to the governance structure of the asset manager and its employees. However, the remuneration rules under the AIFM-Directive and the UCITS-Directive only cover payments to the extent that they benefit the identified categories of staff of the asset manager.⁵⁹ The remuneration rules under the AIFM-Directive and

⁵⁰ Article 14a (1) UCITS-Directive.

⁵¹ Article 14b UCITS-Directive.

⁵² Article 14b (h) UCITS-Directive.

⁵³ Article 14b (n) UCITS-Directive.

⁵⁴ Article 14 (b) (4) UCITS-Directive.

⁵⁵ Article 13 AIFM-Directive.

⁵⁶ Annex II AIFM-Directive.

⁵⁷ ESMA, 'Guidelines on sound remuneration policies under the AIFMD' (Guidelines) ESMA/2013/ 232.

⁵⁸ For a detailed comparison with respect to the AIFM-Directive, see Paulo Câmara, 'The AIFM's Governance and Remuneration Committees: The Impact of the AIFMD' in Dirk Zetzsche (ed), *The alternative investment fund managers directive* (Second edition, 2015).

⁵⁹ ESMA, 'Final report Guidelines on sound remuneration policies under the AIFMD' (guidelines), 13, <https://www.esma.europa.eu/sites/default/files/library/2015/11/2013-201.pdf>; ESMA 'Guidelines on sound remuneration policies under the UCITS Directive' (Guidelines) ESMA/2016/575, 3, https://www.esma.europa.eu/sites/default/files/library/2016-575_ucits_remuneration_guidelines.pdf.

UCITS-Directive only regulate the 2/20-kind of payments from the fund to the manager, when the payments benefit certain categories of staff. In other words, the remuneration rules focus on the relationship between the asset management company and its employees, rather than the relationship between the asset management company and its investors. Given the incompleteness of the prudential framework, expanding the remuneration rules in the AIFM-Directive and UCITS-Directive to payments in the asset manager-investors relationship could help gain traction to mitigate systemic risk. More specifically, the remuneration rules should also cover the 2/20-kind of payments, when they are paid to the asset management company and do not directly benefit certain categories of staff. This would be an expansion of the current scope of the remuneration rules under the AIFM-Directive and the UCITS-Directive.

Second, in contrast to the bank remuneration rules under the CRD-regime, the remuneration rules under the AIFM-Directive and UCITS-Directive do not include a cap on variable pay. As discussed in chapter two, CRD IV limits the performance-based ('variable') packages of credit institutions and investment firms to 100% (or 200% with shareholders' approval) of the fixed component of the total remuneration package for each individual.⁶⁰ As the asymmetric pay-off structure in our long-short equity fund shows similarities with the pay-offs in banks prior to the crisis, an argument could be made to introduce a similar cap for funds.

However, the cap on variable remuneration in banks introduced by CRD IV is highly controversial. For example, it is argued that the cap will lead to an increase in the amount of fixed remuneration, a reduction of the incentives to take 'good' risk and create value, and the loss of talented bankers to financial firms without such pay caps.⁶¹ The reduction of shareholder value due to interventions in the governance framework in the interest of financial stability – away from the traditional shareholder value paradigm – seems an inevitable consequence in the presence of systemic externalities. More important for the present purposes, however, is that the impact of the cap on risk-taking is not at all obvious. It is argued that the pre-crisis fixed component already included a discount to the competitive rate on the employment market and, therefore, incorporated a penalty for poor performance. The decrease in variable pay – and likely increase in fixed pay – could therefore lead to more incentives to take risk with significant downside, as managers bear less of the cost. Moreover, it is argued that the cap also provides less incentives to take risk with significant upside, as the variable performance pay is capped.⁶² In addition, it is claimed that the cap on variable pay will be detrimental to financial stability, because the fixed component of the pay package will be higher and – unlike the variable component – will need to be paid out even in a downturn.⁶³ However, a study by the EBA does not find an indication that bonus caps decrease the stability of the financial institution.⁶⁴ A study by Hakenes and Schnabel⁶⁵, moreover, finds that ceilings on bank bonuses are desirable to mitigate excessive risk-

⁶⁰ Art 94 CRD IV.

⁶¹ Kevin J Murphy, 'Regulating Banking Bonuses in the European Union: A Case Study in Unintended Consequences' (2013) 19 *European Financial Management* 631.

⁶² Murphy (n 61) 645–648.

⁶³ Murphy (n 61).

⁶⁴ EBA, 'Benchmarking of Remuneration Practices at the European Union Level and Data on High Earners' [2016] EBA Report.

⁶⁵ Hendrik Hakenes and Isabel Schnabel, 'Bank Bonuses and Bailouts' (2014) 46 *Journal of Money, Credit and Banking* 259.

taking when the probability of a bank bailout is likely, i.e. in the case of SIFIs. In sum, the effect of the cap on variable pay on managerial risk-taking is not straightforward and is likely to depend on the context in which these caps operate. It is, however, clear that the perverse incentives that bonus caps aim to address are present in both banks and hedge funds. Therefore, although further research on the exact impact on risk-taking of the introduced bonus caps in banks is necessary, the argument can be made that a cap on variable pay in hedge funds could be desirable given the similarities between the problems identified in banks and hedge funds.

2. The governance analysis: CCPs

The discussion in chapter four revealed how the systemic importance of a CCP's activities combined with the perverse incentives of its owners/shareholders can have a detrimental effect on systemic stability. Considering the flaws of the traditional prudential framework identified in chapter five, the question arises as to how the corporate governance mechanisms in place in CCPs affect the behaviour of agents related to these systemic risk concerns. If the general governance arrangements encourage the CCP's agents to increase the systemic footprint of the CCP, a re-oriented governance framework can help gain traction to contain systemic risk. This section first discusses the governance framework in place, before discussing the incentives of the agents. The section concludes with policy recommendations to improve the prudential framework governing CCPs. In essence, the section argues that – in addition to reducing shareholder accountability of managers in general – the responsibility for triggering the default procedure and applying post-default mechanisms in times of systemic stress should be transferred from the managers of the CCP to the prudential authorities.

2.1. The governance framework

Performance-based compensation is a common corporate governance mechanism in CCPs to reduce agency costs in the manager-shareholder relationship. The LCH Group, for example, has an option-based compensation scheme for its executives.⁶⁶ Moreover, the CCP rulebook provides a very detailed description of the CCP's operations and default management.⁶⁷ As a result, the managers' decision-making power is limited by the detail of the rulebook as well.

⁶⁶ The vesting of stock options is dependent on the achievement of a risk management gateway over a three-year period. It is the LCH remuneration committee who will assess whether LCH has managed its risk effectively over a three-year period. Moreover, the award lapses if a CCP from the group suffers a loss of more than 12 million. Furthermore, when there was, or could have been, a material adverse event which could have harmed future business operations, the award can lapse as well, if the remuneration committee determines that the management could or should have prevented such event. The committee can also require repayment of vested options in circumstances discussed in the Plan Rules, see LCH Group Holdings Limited, 'Consolidated Financial Statements' [2017] https://www.lch.com/system/files/media_root/LCH%20Group%20Financial%20Statements%202017.pdf. Accessed 25 July 2018.

⁶⁷ David Elliott, 'Central Counterparty Loss-Allocation Rules' [2013] Bank of England Financial Stability Paper.

2.2. The perverse incentives

Performance-based compensation arrangements broadly speaking align the incentives of the CCP's managers with the CCP's shareholders and business model.⁶⁸ In good times – before clearing member default, performance-based compensation will give the managers incentives to reduce pre-default resources as well as to accept less liquid collateral. As shown in chapter four, this is because limited liability, IBG-YBG, and possible government bail-out reduce the likelihood of ex-post liability for the shareholders. This is true for all three ownership models. However, the discretion of managers to make decisions that influence systemic risk will be limited because most of the process with respect to the execution of the rules related to the CCP's operations and default management is highly automated. The automated and rule-based nature of decision-making moreover also facilitates the supervisor's task to monitor the CCP's activities.

In times of distress – once a clearing member defaults, however, managers will have more discretion to influence the systemic footprint and the interaction between the governance constraints and systemic risk changes. Consider an internal default⁶⁹, where the clearing member defaults on its obligations against the CCP (e.g. by ceasing to respond to margin calls). In such a scenario, stock-based compensation can give managers perverse incentives to 'gamble for resurrection' of the defaulting clearing member(s)⁷⁰ by delaying triggering the default procedure⁷¹. In the case that the resurrection occurs (e.g. due to a bail-out or improvement of market conditions⁷²) before the default procedure is triggered, there will be no loss for owners and non-defaulting clearing members. Indeed, delaying the default process could prevent the default from breaching the default fund, calling for additional funds from clearing members, or impairing the 'skin in the game' of shareholders. While the former two are not directly borne by non-user shareholders, breaching the default fund and calling for additional capital might affect the future cash streams and, therefore, shareholder profits.

⁶⁸ Share price is not always a good reflection of the performance of a firm due to market inefficiencies and short-termism. However, the extent to which stock-based compensation arrangements align the interests of managers and shareholders is irrelevant for the purposes of this thesis. Important is that compensation arrangements are used to reduce agency costs and that such arrangements have an impact on the systemic concerns flagged at the CCP-level.

⁶⁹ This in contrast to an external default, where the default is triggered externally and the CCP has less scope to delay triggering the default procedure.

⁷⁰ Vincent Bignon and Guillaume Vuilleme, 'The Failure of a Clearinghouse: Empirical Evidence' [2017] <https://ssrn.com/abstract=2862673> or <http://dx.doi.org/10.2139/ssrn.2862673>.

⁷¹ The default rules tend to leave CCPs discretion to delay the activation of the default procedure. For example, LCH default rule 4 stipulates 'that a defaulter is a clearing member (i) in respect of whom the Clearing House has issued a Default Notice under Rule 3 or (ii) in respect of whom an Automatic Early termination Event has occurred'. The Eurex website states that 'in addition [to automatic termination events], certain non-automatic termination events (including a failure to pay or to deliver margin, a failure to comply with the Clearing Conditions, or an opening of reorganization or restructuring proceedings) have been defined, upon which a default does not occur automatically, but is actively declared by Eurex Clearing', see LCH, 'Default rules', <https://www.lch.com/system/files/media_root/Default%20Rules.pdf> accessed 20 September 2020; Eurex Clearing, 'Default management process', <<https://www.eurexclearing.com/clearing-en/services/risk-management/default-management-process>> accessed 20 September 2020.

⁷² Bignon and Vuilleme (n 70).

If resurrection does not occur, the default procedure is triggered with possible higher losses, which – as discussed – are capped because of limited liability of the owners⁷³, IBG-YBG and possible government bail-out. These last two scenarios are even more likely in the case of larger losses, increasing the incentives to delay triggering the default procedure. Interestingly, if managers are compensated through options rather than stock, the managers will have less incentives to take risk and gamble for resurrection *after default*. This is because the price of an option is the most sensitive to changes in volatility of the shares (and therefore in the risk-taking by the company) around the strike price of the option. For shareholders, on the other hand, the value of the shares is the most sensitive to changes in volatility when the value of the shares is close to zero. At default, the value of the shares will be closer to zero than to the strike price of the option. As a result, shareholders may have greater incentives to take risk than option-holders.⁷⁴

In addition to perverse incentives created through stock-based compensation, managers might be worried to protect their reputation. Indeed, an internal default might be perceived as being the result of poor management and therefore inhibit their future career perspectives. Reputational concerns might therefore further reinforce the incentives to delay the default procedure.

A study by Bignon and Vuillemeys⁷⁵, for example, finds empirical support for such behaviour based on data collected on the default of the ‘Caisse de Liquidation des Affaires en Marchandises’ (‘CLAM’) in 1974. More specifically, their data shows that CLAM delayed triggering the default procedure when its largest clearing member defaulted on margin calls. CLAM gambled on a price reversal on the sugar market, which would have reversed the default.

Moreover, once the default procedure is triggered – whether based on an internal default or external default – the managers have discretion to trigger post-default mechanisms, such as capital calls and margin gains haircuts. Again, the managers do not necessarily have the right incentives – from a systemic risk point of view – to decide where losses will be borne. For example, in non-user-owned CCPs managers might have incentives to overly rely on clearing member capital calls in order to protect the CCP’s capital, even if this means allocating losses to systemically important clearing members who are already experiencing distress. Moreover, managers do not necessarily have the right information available to assess the impact of their actions on the market. In sum, governance arrangements in place aimed at reducing agency costs in the shareholder-manager relationship increase the agency costs in the society-manager relationship.

⁷³ As discussed in chapter four, contingent capital calls undermine limited liability in the case of user-owned CCPs.

⁷⁴ The empirical literature, however, does not find a significant relationship between bank default during the financial crisis and the pre-crisis vega of managers’ compensation (i.e. the sensitivity of the managers’ compensation to the volatility of the institution’s stock). A higher pre-crisis delta of compensation (i.e. sensitivity of a manager’s compensation to the institution’s share price) was associated with a significantly higher probability of failure during the financial crisis, especially in institutions with high leverage. This suggests that vega is – at best – a second order incentive, see Patricia Boyallian and Pablo Ruiz-Verdú, ‘Leverage, CEO Risk-Taking Incentives, and Bank Failure during the 2007–10 Financial Crisis’ (2018) 22 *Review of Finance* 1763; Rüdiger Fahlenbrach and René M Stulz, ‘Bank CEO Incentives and the Credit Crisis’ (2011) 99 *Journal of Financial Economics* 11.

⁷⁵ Bignon and Vuillemeys (n 70).

2.3. Policy recommendations

As argued in chapter five, EMIR is open-ended regarding the size of the financial resources necessary as well as regarding how much of the waterfall to allocate to pre-default contributions and post-default contributions. Moreover, it was argued that prudential supervision by the NCAs has its limits as gap-filler because of the threat of supervisory competition amongst NCAs as well as the lack of access to the necessary information by the NCAs. As a result, there is scope for governance regulation to help gain traction to reduce systemic risk in CCPs.

EMIR does provide some CCP-specific governance rules that tweak the national corporate governance systems⁷⁶ where considered necessary to ensure compliance with regulation. These new governance rules, however, fail to appreciate the exact nature of the perverse incentives created by the CCP's governance framework. Indeed, EMIR places the final responsibility for the risk management with the board of directors, which – in a shareholder-oriented national corporate governance framework at least – is responsible for monitoring the management on behalf of the shareholders.⁷⁷ EMIR does little to change the (financial) incentives of directors and managers provided by national shareholder-oriented corporate governance frameworks. Although EMIR requires CCPs to have independent directors on the board⁷⁹, independence mostly does not mean independence from shareholders.⁸⁰ Indeed, as indicated by the definition in EMIR, directors are considered independent when they have no relationship 'that raises a conflict of interest regarding the CCP concerned or its controlling shareholders, its management or its clearing members'.⁸¹ No independence from shareholders as a class is required. For example, in many corporate governance regimes independent directors can be still removed by shareholder vote.⁸² Furthermore, although it is true that EMIR prohibits the compensation of independent and non-executive directors from being linked to the performance of the business, only one third of the board needs to be an independent director.⁸³ Performance-related compensation for other board members is allowed. These latter board members are in the majority and could put pressure on the independent directors, especially when they are motivated by large financial incentives to pursue shareholder interest.⁸⁴

⁷⁶ The preamble of the Commission Delegated Regulation (EU) No 153/2013 makes clear that the governance arrangements in EMIR should be interpreted from within the different corporate law regimes in the member states, see (9) Commission Delegated Regulation (EU) No 153/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on requirements for central counterparties.

⁷⁷ See Art. 4 (4) Commission Delegated Regulation (EU) No 153/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on requirements for central counterparties.

⁷⁸ This is a problem also present vis-a-vis bank governance.

⁷⁹ Art. 27 (2) EMIR.

⁸⁰ As such, this is not surprising given that independent directors' very conception was as a watchdog for shareholders as a class.

⁸¹ Art. 2 (28) EMIR.

⁸² John Armour and others, *The Anatomy of Corporate Law: A Comparative and Functional Approach* (Oxford University Press 2017) 85.

⁸³ Art. 27 (2) EMIR.

⁸⁴ Along the same lines, Griffith argues against the independence requirement for directors of CCPs imposed by rules of the CFTC and the SEC, if only because - compared to normal firms - it is unclear what constituency independent directors must protect, as 'most interested private parties do not have an

EMIR does insert loose obligations to consider the interests of other stakeholders. More specifically, EMIR requires CCPs to put processes in place that ensure accountability to stakeholders.⁸⁵ It is the board that is assigned the responsibility for providing accountability to ‘the shareholders or owners and employees, clearing members and their customers and other relevant stakeholders’.⁸⁶ However, such a broad responsibility is likely to be too vague to have any impact, especially when operating in a national corporate governance framework that provides strong (financial) incentives for the board to pursue the interests of shareholders. The preamble of EMIR is a bit more specific regarding which stakeholders should be considered by stating that ‘clearing members and clients need to be adequately represented’.⁸⁷ This is operationalised by, for example, requiring that the risk committee needs to consist of representatives of clearing members, independent directors, and representatives of clients.⁸⁸ As discussed in chapter four, clearing members have suboptimal incentives to invest in ex-ante default prevention to avoid losses from clearing member default. Such strategy increases the importance of post-default mechanisms, which can have a negative impact on financial stability. As a result, including clearing members’ incentives in the risk governance framework is counter-productive from a systemic risk perspective.

In sum, the corporate governance regime in EMIR does not tackle the perverse incentives identified in chapter four. This thesis proposes that governance regulation reducing the accountability of managers to shareholders could help gain traction to reduce systemic risk in CCPs. Although CCPs are closely monitored by the prudential supervisors, such governance interventions could discourage managers to shop around for the most favourable supervisory regime in the EU as well as reduce managers’ incentives to actively lobby for leniency from the prudential supervisor. Moreover, as supervisors do not have access to all the relevant information to perform their supervisory function – for example regarding the composition of the CCP’s portfolio – such governance interventions can avoid misreporting of information by the CCP to the supervisor.

The corporate governance mechanisms used will not necessarily parallel those proposed in banking to reduce shareholder accountability of bank managers. More specifically, the proposals will differ in the extent that they use ‘creditors’ as a proxy for systemic stability. For example, in banking, some of the proposals focus on including the incentives of creditors in the corporate governance framework, since the creditors – as fixed claimants – have incentives to take less risk than bank shareholders.⁸⁹ Indeed, in

adequate incentive to solve the systemic risk problem’, see Sean J Griffith, ‘Governing Systemic Risk: Towards a Governance Structure for Derivatives Clearinghouses’ (2012) 61 *Emory Law Journal* 1153, 1221–1226.

⁸⁵ Art. 3(1)(g) Commission Delegated Regulation (EU) No 153/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on requirements for central counterparties.

⁸⁶ Art. 7(2)(h) Commission Delegated Regulation (EU) No 153/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on requirements for central counterparties.

⁸⁷ Preamble (61) EMIR.

⁸⁸ Art. 28 (1) EMIR.

⁸⁹ See e.g. Lucian A Bebchuk and Holger Spamann, ‘Regulating Bankers’ Pay’ (2009) 98 *Georgetown Law Journal* 247; Steven L Schwarcz, ‘Rethinking Corporate Governance for a Bondholder Financed, Systemically Risky World’ (2017) 58 *William & Mary Law Review* 1345.

banking, the problem rather lies in the reduced incentives of bank creditors compared to creditors of regular firms to monitor opportunistic behaviour of the bank. In CCPs, in contrast, their main creditors – the clearing members – to a certain extent actively gain from encouraging the CCP to reduce ex-ante investment in risk management through the reduction of the costs of the clearing services. Re-orienting the governance framework to include their incentives would be counterproductive.

In addition to reducing shareholder accountability of managers in general, governance interventions can help gain traction to reduce systemic risk by transferring the responsibility for triggering the default procedure and applying post-default mechanisms in times of systemic stress from the managers of the CCP to the prudential authorities. As discussed above, although managers will have a better understanding of the CCP's exposure with respect to the portfolios the CCP clears, the prudential authorities will be better placed to assess the impact of the CCP's actions on the system as a whole.⁹⁰ Such a transfer was also suggested in a recent letter from clearing members and clients where they propose that post-default mechanisms – such as VMGH – should be reviewed and approved by the systemic risk authorities to ensure that the systemic impact is considered.⁹¹

Omarova's golden share proposal to elect a director representing the government with direct, but conditional, management rights can provide a template for governance improvements in CCPs. Applied to CCPs, such proposal would result in the government director having dormant rights pre-default, while having a say on the rules set out in the CCP rulebook. In times of systemic distress, the director would then take a more active role in managing the default of a clearing member in accordance with the financial stability needs. Alternatively, and similar to the current regime under the UCITS-Directive and AIFM-Directive, NCAs can be given the right to intervene in the default procedure and the application of the post-default mechanisms in the interest of the public.

⁹⁰ For example, the prudential authorities might be better placed to assess the impact of a haircut by CCPs on the other market participants.

⁹¹ Allianz Global Investors and others, 'A Path Forward For CCP Resilience, Recovery, and Resolution' (2019) <<https://www.jpmorgan.com/jpmpdf/1320747815087.pdf>> accessed 15 November 2019.

General conclusion

General conclusion.....	142
1. The business model analysis.....	144
1.1. The business model.....	145
1.2. Systemic externalities.....	145
1.3. Perverse incentives under the business model.....	149
2. The incompleteness of the prudential framework.....	151
3. The governance analysis: policy recommendations.....	152
3.1. The corporate governance framework.....	152
3.2. Perverse incentives of agents.....	154
3.2.1. Banks.....	154
3.2.2. Asset managers and their funds.....	155
3.2.3. CCPs.....	156
3.3. Policy recommendations.....	156

This thesis started from the premise that financial institutions delegate the management of their business to an ‘agent’, who is in charge of the decision-making in the interest of the financial institution and its constituencies, including in particular its owners (‘the principal’). The agent can be a natural person or another company. For example, in investment funds, the manager/agent of the fund is another company (‘the asset management company’) with its own shareholders and managers and, as a result, its own distinct utility function and agency costs.

The subject of the analysis of the thesis comprises of the ‘action radius’ of the agent, i.e. the business the agent has capacity/authority to control. The interests of the agent are not necessarily aligned with the interests of the business it controls. This divergence leads to ‘agency problems’, i.e. the problems that arise when a person (‘the principal’) relies on another person (‘the agent’) to manage their interests on their behalf. The agent has more information than the principal about its own actions and the principal cannot acquire that information at zero cost. As a result, the agent could possibly get away with taking decisions that are not in the principal’s best interest.¹

Acknowledging such agency problems, a financial institution will constrain (with more or less efficacy) the agent’s actions to ensure they further the interests of the business and its constituencies. ‘Corporate governance’ refers to the constraints that are put in place in a business to ensure that corporate decisions will – within the boundaries of discretion left by the regulator for making those decisions – take into account the principal’s interests and not the private benefits of those in charge of making the decisions.² As illustrated by the

¹ Michael C Jensen and William H Meckling, ‘Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure’ (1976) 3 *Journal of Financial Economics* 305.

² See chapter I, section 1.

case studies, the specifics of such constraints will vary across different business models and boil down to institutional detail.³

The case studies also made clear that the agent's actions could have a systemic impact in addition to an idiosyncratic one.⁴ This is because, at least in SIFIs, failure or distress of the business creates spill-overs to other parts of the financial system and the real economy. Decisions by agents are, therefore, not only relevant for the financial institution and its constituencies, but also for society as a whole.

However, an institution's business model and corporate governance structure are ordinarily designed to maximise the returns for the principal – particularly its shareholders – and not to safeguard systemic stability beyond the business' private interests. A financial institution will add corporate governance constraints to the extent that the marginal cost of an additional constraint is less than the marginal benefit for the returns of the business by reducing agency costs. The losses resulting from a systemic collapse that can be externalised to other actors in the financial system – i.e. systemic externalities – will not be taken into account in this trade-off. A possible conflict, therefore, exists between the interests of the business and financial stability.

In order to lay bare the relationship between private corporate governance arrangements and systemic risk, the thesis distinguishes between the business model or 'principal-level' and the 'agent-level'.⁵ The 'principal-level', on the one hand, equates to the business under control of the agent, which is ultimately designed to maximise the returns for the financial institution. In characterising this, the thesis assumes zero agency costs and investigates whether the business generates systemic externalities, which distort the trade-offs made in its pursuit. The 'agent-level' analysis, on the other hand, adds the divergence between the agent- and principal-level incentives as an additional layer to the analysis. The agent-level analysis looks at the alignment or lack thereof between the business model and the agent's incentives and its consequences for systemic risk. It determines whether the governance constraints on managers have a neutral, detrimental, or beneficial impact on the managers' decision-making from a systemic risk perspective.

Assuming regulatory intervention, the regulator has essentially two options to mitigate systemic externalities: either (i) define the boundaries of the range of actions a *financial institution* – and by extension their agents – are permitted to take ('external regulation') or (ii) define the boundaries of the constraints and control mechanisms on the actions of the decision-maker or *agent* ('corporate governance regulation'). In other words, external regulation operates on the principal-level and constrains the set of choices a financial institution can make. Corporate governance regulation, on the other hand, operates on the agent-level and regulates the environment within which the financial institution's agents make choices without limiting those choices.⁶

The thesis does not dispute the need for external prudential regulation to tackle systemic risk, but also acknowledges that such external regulation is

³ See chapter VI.

⁴ See chapter III, section 2 for asset managers and their funds and chapter IV, section 2 for CCPs.

⁵ See chapter II, section 2.

⁶ See chapter II, section 2.

necessarily incomplete^{7 8}, i.e. does not unambiguously specify for all future contingencies.⁹ Prudential regulation is an example where the incompleteness is particularly high, if only because financial innovation and complexity create a significant information asymmetry between financial institutions and regulators.¹⁰ The issues surrounding the calculation of risk-based capital requirements or the premium paid for deposit guarantee systems are illustrative examples in this context. In the context of prudential regulation, it is increasingly acknowledged that supervision by the prudential authorities is a key tool to fill in the gaps left by prudential norms. However, this thesis argued that prudential supervision is not perfect either and governance regulation can – partly – fill in the gaps left by external prudential regulation and supervision.¹¹

This concluding chapter gives an overview of the thesis' analysis. In doing so, it provides a summary of the analytical framework that can be used to determine the need for regulation of the corporate governance constraints in financial institutions to help gain traction to mitigate systemic risk in the financial sector. Throughout the chapter, we use the case studies – discussed in the previous chapters – as illustrations of the application of the framework. However, the chapter does not aim to provide a full assessment of these case studies. Rather, it aims to lay out the process necessary to determine the scope for corporate governance regulation in any type of financial institution. In doing so, it provides the tools necessary to expand the analysis to financial institutions outside the scope of this thesis.

1. The business model analysis

The thesis started by examining the systemic importance of the case studies. This was termed the 'business model' or 'principal'-level analysis.¹² The principal-level or business model analysis investigates whether a financial institution generates systemic externalities, which distort the trade-offs made within the *business model*. The analysis consists of three steps. First, the analysis determines the 'business model' of the financial institution in question, i.e. its strategy to generate revenue. Second, the analysis looks for features of the business model that could pose a threat to financial stability. Different business models are characterised by different packages of systemic features leading to

⁷ For a detailed exploration of incomplete law at a conceptual level, see Katharina Pistor and Chenggang Xu, 'Incomplete Law' (2003) 35 New York University Journal of International Law and Politics 931; Katharina Pistor and Chenggang Xu, 'Fiduciary Duty in Transitional Civil Law Jurisdictions. Lessons from the Incomplete Law Theory' in Curtis J Milhaupt (ed), *Global markets, domestic institutions: corporate law and governance in a new era of cross-border deals* (Columbia University Press 2003).

⁸ See chapter V, section 1.1 and section 2.

⁹ The notion of incomplete law is inspired by the incomplete contract theory, as developed in the economics literature, see for example Oliver Hart and John Moore, 'Foundations of Incomplete Contracts' (1999) 66 Review of Economic Studies 115; Eric Maskin and Jean Tirole, 'Unforeseen Contingencies and Incomplete Contracts' (1999) 66 Review of Economic Studies 83.

¹⁰ On regulating complexity in the financial market, see Saule T Omarova, 'License to Deal: Mandatory Approval of Complex Financial Products' (2012) 90 Washington University Law Review 63.

¹¹ See chapter V, section 1.3 and section 4.

¹² See chapter II, section 3.1 for banks, chapter III for asset managers and their funds and chapter IV for CCPs.

different packages of systemic problems. Finally, the analysis determines whether the pursuit of profit under the business model encourages the presence and severity of these systemic features. In all case studies¹³ discussed in the previous chapters, the business model analysis finds a conflict of interest between the pursuit of profit under the business model and the systemic concerns identified. Hereunder, the section discusses each step of the principal-level analysis in more detail.

1.1. The business model

First, different types of financial institutions have different business models, i.e. strategies to generate returns for their owners. The thesis considers three types of financial institutions: banks, CCPs, and investment funds. Banks earn profits from the transformation of short-term liquid deposits into long-term illiquid loans, i.e. through the spread between interests on deposits (liabilities) and interests on loans (assets). CCPs generate revenue by charging fees for their clearing services. Investment funds, moreover, earn returns from investments within a certain investment strategy. These returns are generated on other people's money, namely on funds provided by its investors.

Business model	Banks	CCPs	Investment funds
	Liquidity and maturity transformation	Clearing fees	Investment profits

Table 1 Overview of the business models of the case studies

1.2. Systemic externalities

Second, each business model has different features that determine the risks the financial institution poses to the stability of the financial system, i.e. determines whether it generates systemic externalities. In order to determine the risk of systemic externalities, the analysis distinguishes between principal-level and system-level risks created by these features. The distinction is based on the locus of the consequences of the presence of certain features. Principal-level risks are borne by the principal and will be included in the trade-offs made by the business model. This includes liquidity and insolvency risk. System-level risks, on the other hand, are risks borne by the system as whole and – to the extent there is no contractual or institutional relationship between the affected parties and the financial institution – these risks can be externalised.

Principal-level problems turn into system-level problems through three main contagion channels: the counterparty channel, the asset liquidation, and the critical function. First, the counterparty channel allows the risks to spread by compromising the liquidity or solvency of a financial institution's counterparties. Second, the asset liquidation channel refers to the risk of contagion through

¹³ See chapter II, section 3.1 for banks, chapter III for asset managers and their funds and chapter IV for CCPs.

disruptive sales of illiquid assets, which negatively affects asset prices and, as a result, the financial players exposed to these assets. Distress is spread not because of direct contractual links, but through exposure to similar assets. Third, the critical function channel considers the risk of contagion when a financial institution can no longer perform a critical service to the financial system for which there are no substitutes.¹⁴

Four systemic features are often discussed in the context of the systemic nature of a business model: liquidity, leverage, competitive market, and size. The first systemic feature, liquidity, refers to the ability of a business to meet its short-term liabilities by converting its assets into cash. Liquidity problems in an individual institution can turn into system-level problems through fire sales of illiquid assets, which contaminate the rest of the system through the asset liquidation channel. The thesis finds liquidity issues in all three case studies. In banks, the business model inevitably leads to banks holding illiquid loans funded by liquid deposits. This creates liquidity problems in the case of a sudden increase in the demand for liquid assets, for example in the case of bank runs.¹⁵ Similar problems can occur if an investment fund holds illiquid investments funded by investors with strong redemption rights. In normal times, CCPs, in contrast, run a 'matched book', i.e. the position taken with the original buyer is always offset by the position taken with the original seller. Liquidity problems, however, can occur when a major contract party defaults and the liquidation of collateral to close the defaulting positions leads to fire sales.

A second systemic feature is the use of leverage, i.e. mechanisms —such as borrowing—to increase the institution's risk beyond what would be possible through direct investment of the financial institution's own funds. Leverage can lead to massive losses on investments and liquidity problems (e.g. due to margin calls or when long-term assets are funded by short-term debt). These problems can spread to other parts of the financial system via the counterparty and asset liquidation channels. A bank's balance sheet is funded through mainly deposits and therefore highly leveraged. Certain investment funds also use leverage to boost their earnings. CCPs, in contrast, earn money through fees and are not leveraged.

The relationship between the third systemic feature, competition, and systemic risk is less straightforward. In banks, competition reduces the rents banks want to protect and therefore reduces the expected costs of failure for the bank. Moreover, competitive markets for deposits can also raise interest rates on the short end of the carry trade, leading banks to take on more risk at the long end. On the other hand, in a competitive market it is more likely that the failing bank's competitors will be able to take over the business provided by the bank, reducing the risk of loss of critical services in the financial system.¹⁶

In CCPs, competition will encourage CCPs to lower standards in order to attract customers, for example by reducing the amount of margin required or accepting less liquid collateral.¹⁷ This will increase the likelihood that its non-

¹⁴ FSOC, 'Basis for the Financial Stability Oversight Council's Final Determination Regarding MetLife, Inc.' (2014).

¹⁵ John Armour and Jeffrey N Gordon, 'Systemic Harms and Shareholder Value' (2014) 6 *Journal of Legal Analysis* 35, 40.

¹⁶ FSOC (n 14).

¹⁷ 'The Risk in Clearing-Houses All Clear?' [2012] *The Economist*.

defaulting counterparties will be impaired by a clearing member default and that fire sales of illiquid collateral will impact asset prices.¹⁸ On the other hand, competition makes it more likely that other CCPs could take over its services, reducing the intensity of the critical function channel. However, the clearing business has significant economies of scale (cf. netting efficiencies). Consolidation is therefore more likely than competition.¹⁹

In investment funds, similarly to banks, competition reduces the rents funds want to protect and therefore reduces the costs of failure. This can lead to more risk-taking and therefore liquidity and solvency risk. Again, these risks can spread via the counterparty and asset liquidation channel.

Finally, the fourth systemic feature, the size of the financial institution, is important to assess the impact of idiosyncratic problems on the system. The size of a bank's balance-sheet and off-balance sheet exposures influence the impact of liquidity and solvency problems on the market; the bigger the bank the more likely distress will spread through the financial system via the counterparty and asset liquidation channel.

Along the same lines, in CCPs, the greater the volume and the number of transactions the CCP processes, the more likely disruptions in its services will impair counterparties and impact asset prices. On the other hand, the CCP could be analysed as an insurance company and larger insurance companies are considered more stable. This is because they profit from greater diversification and are able to collect premiums from a larger group of clients to meet its insurance obligations.²⁰ However, CCPs are special to the extent that its mutualisation mechanism enhances the correlation between the defaults of its clearing members. More specifically, post-default contributions to the default waterfall by non-defaulting clearing members increase the correlation between the clearing members' defaults. This is because these contributions put additional pressure on non-defaulting clearing members in often stressed times.

In investment funds, the more assets the fund has under its management the more likely that fund-level problems will result in distress to its counterparties and impact asset prices through fire sales. Asset sales will impact asset prices if (a) the assets of a fund are sufficiently large – relative to normal trading volume or to the total size of the market, or (b) the resulting financial difficulties of the fund are correlated with financial difficulties at other funds or financial institutions more generally, which as a herd cause systemic spill-overs.

The more of these systemic features present in a business model, the more likely that principal-level risks turn into system-level risks and that the financial institution becomes systemically important. As shown in Table 2, for example, bank I is less likely to induce system-level risks than bank II, bank III, and bank IV, in ascending order of systemic importance. A similar analysis is made for CCPs and investment funds in Table 3 and Table 4 respectively. However, the

¹⁸ An analogy can be made with the American casualty insurance industry in the 19th century, "[...] which [...] was [...] characterized by a multitude of insurance companies jostling to out-compete one another. They fought to offer policyholders low premiums, driving each other out of business in swift cycles, until periods of mass claims such as the Chicago and Boston fires of 1871 and 1872 forced insurance cartels to set rates so as to restrain competition", see Felix B Chang, 'The Systemic Risk Paradox: Banks and Clearinghouses under Regulation' [2014] Colum. Bus. L. Rev. 747, 777.

¹⁹ For an overview of consolidation in the clearing business, see *ibid* 761–775.

²⁰ *ibid* 777.

dashboard can help assess the likelihood of system-level problems in any type of financial institution.

Systemic features	Bank I	Bank I	Bank III	Bank IV
Runnable/short-term funding	Yes	Yes	Yes	Yes
Illiquid assets	Yes	Yes	Yes	Yes
Leverage	No	Yes	Yes	Yes
Competitive market	No	No	Yes	Yes
Size	No	No	No	Yes
Principal-level risk				
Liquidity risk	+	++	+++	+++
Solvency risk	0	+	++	++
System-level risk				
Counterparty channel	0	+	++	+++
Asset liquidation channel	+	++	+++	++++
Critical function channel	+	+	0	0

Table 2 Dashboard showing the systemic importance of banks

Systemic features	CCP I	CCP II	CCP III
Runnable/short-term funding	No	No	No
Illiquid assets (collateral)	Yes	Yes	Yes
Leverage	No	No	No
Competitive market	No	Yes	Yes
Size	No	No	Yes
Principal-level risk			
Liquidity risk	+	++	++
Insolvency risk	0	+	+
System-level risk			
Counterparty channel	0	+	++
Asset liquidation channel	+	++	+++
Critical function channel	+	0	0

Table 3 Dashboard showing the systemic importance of CCPs

Systemic features	F I	F II	F III	F IV
Runnable/short-term funding	Yes	Yes	Yes	Yes
Illiquid assets	Yes	Yes	Yes	Yes
Leverage	No	Yes	Yes	Yes
Competitive market	No	No	Yes	Yes
Size	No	No	No	Yes
Principal-level risk				
Liquidity risk	+	++	+++	+++
Default risk	0	+	++	++
System-level risk				
Counterparty channel	0	+	++	+++
Asset liquidation channel	+	++	+++	++++
Critical function channel	+	+	0	0

Table 4 Dashboard showing the systemic importance of funds

1.3. Perverse incentives under the business model

Given system-level risks, the final step in the analysis determines the interaction between the business model and systemic risk. More specifically, it determines whether the business benefits from the presence of these systemic features and, therefore, will actively pursue business strategies that increase systemic risk in the system. If the answer is positive, the trade-offs made by the business model will not consider the system-level risks resulting from systemic features, as these risks can be externalised to third parties. Using the case studies as point of reference, the analysis discusses the incentives with regard to the four systemic features identified above.

First, in the three case studies the thesis finds a distorted trade-off with regard to both liquidity and leverage. In banks and investment funds, the shareholders or investors have an asymmetric option: limited liability protects against the losses suffered due to risky behaviour beyond their capital input, while profits are uncapped. As a result, the losses stemming from investments in risky/illiquid assets funded by short-term debt or from taking high leveraged positions can be partly externalised onto third parties, while profits can be enjoyed without limit.

In CCPs, the owners profit from reducing clearing fees, for example by accepting less liquid collateral. This is because lower clearing fees decrease the owners' own costs of using the clearing services (in the user-owned model) or allow the CCP to attract more customers/volume to increase fee-income in a competitive market (in the non-user-owned model). While the acceptance of illiquid collateral can have destabilising effects in times of distress, the shareholders will not sufficiently care due to the possibility of government bail-out in the case of a TBTF-status as well as the limited liability of shareholders. In the case of user-owned CCPs, the liability of the owners for user default goes beyond the capital input through default fund contributions and post-default capital calls. However, this will not sufficiently influence user-owners' behaviour, as correlation between users' defaults significantly reduces the likelihood they will have to pay post-default ('I'll Be Gone – You'll Be Gone').

With respect to competitive markets, both banks and funds have incentives to obtain a monopolistic share of the market in order to extract private benefits (e.g. by offering a unique product), reducing systemic concerns. However, the opportunities in both markets to do so are rather limited due to the competitive nature of the market. CCPs have similar incentives to aim to obtain a monopolistic share of the market. In the case a new product comes onto the market (e.g. bitcoin futures), CCPs will compete for market share. However, substantial economies of scale in the clearing business – due to netting efficiencies and their insurance-like role²¹ – make it likely that after an initial period of competition one CCP will obtain a monopolistic position in the market.

Finally, with respect to size, the analysis turns on what is the ‘optimal’ size of the business. In banks, although the literature is undecided, there is evidence that banks enjoy increasing returns to scale, except the largest/too-big-fail-banks where there are decreasing returns to scale.²² The argument could be made that the increased regulatory burden for the biggest banks (e.g. increased capital requirements) incentivises banks to limit their size. On the other hand, the bigger the bank, the higher the likelihood of bailout and therefore the lower the financial costs for shareholders, incentivising banks to become TBTF.²³

Along the same lines, there will be an ‘optimal’ size of an investment fund. Some types of funds have decreasing returns to scale. For instance, active funds face decreasing returns to scale, as the opportunities to outperform the benchmark become scarcer with increases in the industry’s size.²⁴ This signals that investors of active funds have no incentive to pursue unlimited size. Passive funds seem to be unaffected by scale effects.²⁵

CCPs, lastly, become more efficient with size due to netting efficiencies and diversification benefits.²⁶ Moreover, as fee-income is partly based on the volume of the product being cleared, the business has even stronger incentives to become as big as possible. Finally, a TBTF-status will increase the likelihood of a bail-out.

In sum, in CCPs and funds with increasing returns to scale, the business model has a negative impact on all the systemic features discussed, except competition. For competition, the economies of scale in CCPs encourage consolidation rather than competition, which prevents race to the bottom incentives. On the other hand, consolidation reinforces the critical function channel. For funds, the business model – in theory – also encourages the acquisition of a monopolistic position in the market with potentially beneficial consequences for stability. For the purpose of the discussion, however, we can abstract away from this possibility, as the nature of the asset management

²¹ See for an in-depth analysis *ibid* 776–784.

²² Ayse Sapci and Bradley Miles, ‘Bank Size, Returns to Scale and Cost Efficiency’ (Department of Economics, Colgate University 2017) <<https://EconPapers.repec.org/RePEc:cgt:wpaper:2017-02>>.

²³ Mark J Roe, ‘Structural Corporate Degradation Due to Too-Big-to-Fail Finance’ (2014) 162 *University of Pennsylvania Law Review* 1419.

²⁴ Luboš Pástor and Robert F Stambaugh, ‘On the Size of the Active Management Industry’ (2012) 120 *Journal of Political Economy* 740; Luboš Pástor, Robert F Stambaugh and Lucian A Taylor, ‘Scale and Skill in Active Management’ (2015) 116 *Journal of Financial Economics* 23.

²⁵ Georgios Magkotsios, ‘Industry-Level Returns to Scale and Investor Flows in Asset Management’ [2017] working paper.

²⁶ See for an in-depth analysis Chang (n 18) 776–784.

business is unlikely to allow for a major monopolistic market share to be acquired.

For banks and funds with decreasing returns to scale, all factors are negatively influenced, apart from size and competition. Again, for the purposes of the discussion we can abstract away from the possibility that banks/funds acquire a monopolistic position in the market with potentially beneficial consequences for stability. Indeed, the nature of the banking/fund business is unlikely to allow for major monopolistic market shares to be acquired.

2. The incompleteness of the prudential framework

The thesis then continued by examining to what extent the traditional prudential framework addresses the systemic issues identified.²⁷ First, the analysis made clear that it is impossible and often undesirable for lawmakers to determine – ex-ante – the exact content of the norms necessary to ensure financial stability. Indeed, lawmakers operate under cognitive or temporal constraints leading to incomplete coverage. Moreover, changed circumstances – unanticipated by the lawmakers – can make the law poorly suited to attaining its objectives. Furthermore, open-ended norms can also be the result of deliberate design, because lawmakers consider it the most appropriate regulatory technique. In addition, lawmakers face incentive problems and do not necessarily pursue the public interest. In sum, prudential norms are inevitably incomplete and do not specify – ex-ante – all future contingencies.

This theoretical observation was confirmed through the analysis of the case studies. First, the UCITS regime does not establish an exhaustive list of financial instruments that are considered liquid and therefore eligible as investment for funds organised under the UCITS regime. In other words, the UCITS regime employs open-ended norms in order to be able to capture new financial instruments as well as address the time-sensitive nature of liquidity. Moreover, regarding leverage, UCITS have significant flexibility regarding the calculation of the limits on synthetic leverage. Second, under the AIFM regime, the prudential norms provide AIFM only with vague and open-ended guidelines – such as considering the impact on systemic risk – to determine the appropriate leverage limits. Moreover, the norms related to liquidity are mainly procedural in nature. Finally, under EMIR, the norms are open-ended with respect to the level of financial resources needed by the CCP as well as the allocation of resources to pre-default and post-default contributions in the waterfall. In sum, the prudential norms governing the case studies are vague and open-ended.

It was then argued that certain types of prudential supervision can – to some extent – fill in the gaps left by prudential norms. More specifically, it was explained that risk-based supervision can go a long way in filling in the gaps left by prudential norms. Risk-based supervision relies on continuous contact and conversation between supervisors and the supervised entity in order to achieve the regulatory objectives. The supervisory staff is granted with substantial discretion, for example regarding what information to collect, the evaluation of the financial institution's risk management and assessment of the quality of its assets. Such supervision provides supervisors – in theory – with the flexibility to

²⁷ See Chapter V.

timely respond to new issues and leverage the experience and knowledge of the regulated actors to do so.

However, prudential supervision has its limits as well. First, it is argued that prudential supervision is limited by jurisdictional boundaries, potentially leading to supervisory competition in the EU and a 'race to the bottom' amongst NCAs regarding prudential requirements. Indeed, prudential authorities do not necessarily act in the public interest and self-interest of the parties involved can affect the effectiveness of the prudential framework. Second, in practice, prudential supervision is often a far cry from the iterative and flexible process described above, leaving significant leeway to the regulated actors. Finally, the complex and dynamic nature of the financial system leads to an enormous informational challenge for the public authorities, which can hinder effective supervision.

It is then argued that the imperfections of prudential supervision carve out a role for governance regulation. Governance norms differ from traditional 'external' prudential norms in that they are less affected by macro-economic change and can therefore be stipulated at the EU-level in a more complete manner. This reduces the opportunities for supervisory competition regarding prudential requirements at the level of the NCAs. Moreover, well-designed governance interventions can encourage managers across the EU to fill in the gaps in the prudential framework in line with prudential goals and, therefore, complement the gap-filling role of the prudential supervisors. This is especially important in the case of significant information disadvantages of the supervisor and in the case of a high level of residual discretion of the regulated actors due to weak supervision (e.g. because of limited financial resources).

3. The governance analysis: policy recommendations

Finally, the thesis argued that corporate governance regulation can contribute to the prudential framework by redefining the boundaries of the private constraints on the actions of the agent.²⁸ The analysis proceeded in three steps. First, the analysis identified how the agent's actions are constrained within the business model. In other words, it established the functioning of the corporate governance framework within the financial institution in question. In a second step, the analysis determined the incentives of the agents with regard to both the business model and the systemic risk considerations. Put another way, the analysis determined whether the constraints reduce agency costs between the agent and the business as well as the agent and systemic risk considerations. Finally, the thesis provided policy recommendations given the analysis in the previous two steps.

3.1. The corporate governance framework

In the first step the thesis mapped out the corporate governance framework in place in the financial institution. According to the predominant view in the Anglo-American²⁹ corporate governance scholarship³⁰, a business should be run

²⁸ See chapter VI.

²⁹ The new UK corporate Governance Code 2018 - which will take effect from 1 January 2019 - includes a new provision asking the board to describe in its annual report how it considered the

in the interests of its shareholders, within the boundaries of the applicable law and prior agreements with other stakeholders.³¹ The relationship between the shareholders and the executives, however, suffers from ‘agency problems’. Indeed, the interests of the executives and the shareholders are not necessarily aligned. Compared with shareholders in a public company, for example, executives are not diversified—and so have relatively lower risk tolerance. As a result, in such a set-up, they might avoid risky investments even though the investments have a positive net present value. When risky investments turn out negatively, the managers might lose their job, while – absent performance-based compensation – their salary will remain the same when the investments turn out positively.³² Moreover, executives might be motivated to build their empire by for example engaging in mergers and acquisitions that increase the size and prestige of the business, but have a negative net present value. They might also engage in self-dealing, for example by excessive personal use of companies’ perks such as private jets or by helping out befriended suppliers.³³ Such opportunistic behaviour is categorised as an example of ‘agency costs’, as the behaviour reduces the value of the executives’ performance to the shareholders.

It follows that – under the predominant view – ‘corporate governance’ mechanisms should minimise these agency costs and ensure that executives act in the shareholders’ interests instead of their own.³⁴ In principle, a decrease in agency costs will be priced in by shareholders and, as a result, will benefit the business through reduced cost of equity funding.³⁵

Corporate governance practice in the case studies seems to adhere to the predominant shareholder-focused view and focuses on shareholder accountability. Prior to post-crisis regulatory reforms, bank managers received performance-based compensation in the form of shares and options, which gave

interests of other stakeholders under their duty under Section 172 of the 2006 Companies Act. Section 172 requires a director to ‘act in the way he considers, in good faith, would be most likely to promote the success of the company for the benefit of its members as a whole, and in doing so have regard (amongst other matters) to [...] the interests of the company’s employees [...] [and] the impact of the company’s operations on the community and the environment’. The phrasing of the section implies that the interests of other stakeholders are only considered to the extent they promote the interests of the shareholders. As a result, this new provision cannot be seen as a departure from shareholder accountability as the general model of corporate governance, see Financial Reporting Council, ‘The UK Corporate Governance Code’ (2018).

³⁰ In the comparative literature, the standard narrative is that corporate governance in continental Europe, Japan and China tends more towards the stakeholder-oriented model, while the corporate governance in the UK and US are focused on shareholder value, see M Gelter, ‘The Dark Side of Shareholder Influence: Managerial Autonomy and Stakeholder Orientation in Comparative Corporate Governance’ (2009) 50 *Harvard International Law Journal* 129, 131; Mathias M Siems, *Convergence in Shareholder Law* (Cambridge University Press 2008) 176–178.

³¹ Frank H Easterbrook and Daniel R Fischel, *The Economic Structure of Corporate Law* (Harvard University Press 1991) 38; Milton Friedman, ‘The Social Responsibility of Business Is to Increase Its Profits’ [1970] *The New York Times Magazine*; Jonathan R Macey, *Corporate Governance: Promises Kept, Promises Broken* (Princeton University Press 2008).

³² Martin J Conyon, ‘Executive Compensation: Governance and the Financial Crisis’, *The Oxford Handbook of Capitalism* (Oxford University Press 2012) 373; Easterbrook and Fischel (n 31) 90.

³³ Conyon (n 32) 373; Henry Hansmann, *The Ownership of Enterprise* (The Belknap Press of Harvard University Press 1996) 37–38.

³⁴ Macey (n 31); Andrei Shleifer and Robert W Vishny, ‘A Survey of Corporate Governance’ (1997) 52 *The Journal of Finance* 737.

³⁵ Jensen and Meckling (n 1).

incentives to increase short-term profits in order to receive large amounts of performance compensation.³⁶ Now, the FSB principles recommend, among other things, limiting managers' ability to benefit from short-term profits through retention periods and clawbacks.³⁷ In CCPs, performance-based compensation is also a common corporate governance mechanism to reduce agency costs in the manager-shareholder relationship. The specifics differ across CCPs. The LCH Group, for example, has an option-based compensation scheme for its executives.³⁸ In index funds, the management fee of a fund is typically calculated as a percentage of the assets under management. This compensation structure aligns the incentives of asset managers and fund investors by making the asset managers de facto equity investors, as they receive a percentage of the fund's assets. Moreover, the asset managers have little discretion to decide on the investment strategy, which reduces agency costs with regard to asset allocation and portfolio decisions. Hedge funds create an asymmetric pay-off structure by giving managers an uncapped share of the profits, while also guaranteeing a percentage of the AUM.

3.2. Perverse incentives of agents

The next step in the analysis determined how the corporate governance framework affects the behaviour of the agents related to the systemic risk concerns identified at the principal-level. If a financial institution with a systemic business model successfully controls agency costs, society will be negatively affected because agents will have incentives to generate systemic externalities. If such financial institution, however, fails to control the agency problems, society may be better or worse off depending on the details of the corporate governance framework. Broadly speaking, the analysis showed that the governance constraints align the incentives of the managers with the perverse incentives of the shareholders and business model.

3.2.1. Banks

In banks, stock-based compensation aligns the incentives of managers with the bank's business model by using the share price as proxy for bank performance. However, the share price is not always a good reflection of the performance of a firm due to market inefficiencies and short-termism. It is argued that bank executive compensation pre-crisis gave incentives to increase short-term profits

³⁶ Lucian Bebchuk, Alma Cohen and Holger Spamann, 'The Wages of Failure: Executive Compensation at Bear Stearns and Lehman 2000-2008' (2010) 27 *Yale journal on regulation* 257.

³⁷ FSB, 'FSB Principles for Sound Compensation Practices' (2009).

³⁸ The vesting of stock options is dependent on the achievement of a risk management gateway over a three-year period. It is the LCH remuneration committee who will assess whether LCH has managed its risk effectively over a three-year period. Moreover, the award lapses if a CCP from the group suffers a loss of more than 12 million. Furthermore, when there was, or could have been, a material adverse event which could have harmed future business operations, the award can lapse as well, if the remuneration committee determines that the management could or should have prevented such event. The committee can also require repayment of vested options in circumstances discussed in the Plan Rules, see LCH Group Holdings Limited, 'Consolidated Financial Statements' [2017] https://www.lch.com/system/files/media_root/LCH%20Group%20Financial%20Statements%202017.pdf. Accessed 25 July 2018.

in order to receive large amounts of performance compensation, even though this increased the probability of large losses for shareholders in the long term.³⁹ From a systemic risk perspective, performance-based compensation in banks creates incentives to take excessive risk through increased use of leverage and investment in illiquid/risky loans. Pre-crisis, these incentives were possibly even stronger at the agent-level than at the principal-level due to short-termism. In other words, the interaction between the principal and agent-level was detrimental for systemic stability. The regulatory reforms in bank corporate governance aim to address these perverse incentives through, amongst others, holding periods and claw backs for stock-based compensation.

3.2.2. Asset managers and their funds

In funds, we make a distinction between index funds and hedge funds. For index funds – assuming increasing returns to scale – a compensation scheme based on a percentage of the AUM and the predictable investment strategy align the incentives of investors and asset managers. The agent has a direct observable link with the payoffs for the principal, as the compensation is directly linked to the assets invested in.

From a systemic risk perspective, the thesis argued that investment constraints can lead to a mechanical approach to security selection in index funds based on the securities included in the index, which increases correlated selling of those securities. Moreover, although post-default mechanisms such as suspension of redemption can alleviate such systemic concerns, the thesis argued that the governance constraints do not provide managers with the right incentives. Compensation calculated based on the AUM does not provide for appropriate incentives for three reasons. Firstly, as managers are repeat players, reputational concerns could result in the underuse of suspension of redemption in times of crisis. Indeed, investors could attribute the need to suspend redemption to poor liquidity management by the manager rather than systemic stress, leading to lasting reputational damage for the manager. Secondly, managers could fear that suspension of redemption in one fund could result in investors losing confidence in other funds under their management.⁴⁰ Finally, managers will only apply suspension in the interest of its unitholders, as is also explicitly stipulated in the UCITS-Directive. Where unitholders are able to externalise the costs of a large-scale redemption on the financial system, the interests of the unitholders will not align with the interests of the system as a whole.⁴¹ In addition to the perverse incentives provided by the compensation arrangements, managers might not have access to the necessary information to assess the macroprudential situation in the market when deciding on the need for such suspension.

In hedge funds, on the other hand, the performance-based compensation scheme is broadly speaking in line with the asymmetric option of the investors on the fund's assets. This is undesirable from a systemic risk perspective. The asymmetric option of managers is even stronger than for the investors. In the

³⁹ Bebchuk, Cohen and Spamann (n 36).

⁴⁰ ESRB, 'Recommendation of the European Systemic Risk Board of 7 December 2017 on Liquidity and Leverage Risks in Investment Funds' (Recommendation)' ESRB/2017/6 17.

⁴¹ *ibid.*

good years, the managers can cash in on the entire upside of profits above the HWM. In bad times, the losses are not borne by the managers, but by the investors. Moreover, the management fees – which are a fixed percentage of the AUM – provide a floor for the losses, ensuring that the costs of the asset management business are covered.

3.2.3. CCPs

Finally, in CCPs, stock-based compensation broadly speaking aligns the incentives of the managers with the incentives of the shareholders and the CCP's business model based on increasing volume and fee-income. As in the bank case, reservations can be made regarding the alignment (or lack thereof) between share price and CCP performance in the long-term.

From a systemic risk, perspective, however, this thesis argued that – in times of distress – stock-based compensation in CCPs can give managers perverse incentives to 'gamble for resurrection' of the defaulting clearing member(s)⁴² by delaying triggering the default procedure. Moreover, in addition to perverse incentives created through stock-based compensation, managers might be worried to protect their reputation, as an internal default might be perceived as being the result of poor management and therefore inhibit their future career perspectives. Moreover, once the default procedure is triggered – whether based on an internal default or external default – the managers have discretion to trigger post-default mechanisms, such as capital calls and margin gains haircuts. Again, the managers do not necessarily have the right incentives – from a systemic risk point of view – to decide where losses will be borne. For example, in non-user-owned CCPs, managers might have incentives to overly rely on clearing member capital calls in order to protect the CCP's capital, even if this means allocating losses to systemically important clearing members who are already experiencing distress. Moreover, in any case, managers might not have the right information available to assess the impact of their actions on the market. In sum, governance arrangements in place aimed at reducing agency costs in the shareholder-manager relationship increase the agency costs in the society-manager relationship.

3.3. Policy recommendations

The thesis' analysis showed that the incentives problems identified for systemically important banks also exist in other classes of non-bank SIFIs. However, there exists heterogeneity in the nature of these problems and, as a result, in the nature of the solutions. The results of the research inform the debate on the effectiveness of the corporate governance rules applicable to non-bank SIFIs. The thesis not only provides concrete policy recommendations for the case studies, but also offers a general framework to analyse the role of governance regulation to gain traction to mitigate systemic risk in any type of financial institution.

More specifically, the thesis makes the following concrete policy recommendations. In index funds, the thesis proposes that, in times of systemic

⁴² Vincent Bignon and Guillaume Vuillemeys, 'The Failure of a Clearinghouse: Empirical Evidence' [2017] <https://ssrn.com/abstract=2862673> or <http://dx.doi.org/10.2139/ssrn.2862673>.

stress, the responsibility for applying ex-post liquidity management tools, and suspension more particularly, should switch from the managers of the fund to the prudential authorities. Such a governance strategy is also expressly envisioned in both the UCITS-Directive and the AIFM-Directive. This governance solution could mitigate the informational and perverse incentives problems identified above.

In hedge funds, the thesis argues in favour of expanding the scope of the payments covered by the EU remuneration rules as well as for introducing a cap on variable pay. First, the thesis proposes an expansion of the scope of the payments covered by the remuneration rules under the AIFM-Directive and UCITS-Directive. The remuneration rules under the AIFM-Directive and the UCITS-Directive only cover payments to the extent that they benefit the identified categories of staff of the asset manager.⁴³ Consequently, the remuneration rules under the AIFM-Directive and UCITS-Directive only regulate the 2/20-kind of payments from the fund to the manager, when the payments benefit certain categories of staff. Given the incompleteness of the prudential framework and the identified perverse incentives, the remuneration rules should also cover the 2/20-kind of payments, when they are paid to the asset management company and do not directly benefit certain categories of staff. Moreover, in contrast to the bank remuneration rules under the CRD-regime, the remuneration rules under the AIFM-Directive and UCITS-Directive do not include a cap on variable pay. As the asymmetric pay-off structure in our long-short equity fund shows similarities with the pay-offs in banks prior to the crisis, an argument could be made to introduce a similar cap for hedge funds.

In CCPs, finally, the thesis proposes that governance regulation reducing the accountability of managers to shareholders could help gain traction to reduce systemic risk in CCPs. The corporate governance mechanisms used will not necessarily parallel those proposed in banking to reduce shareholder accountability of bank managers. More specifically, the proposals will differ to the extent that they use 'creditors' as a proxy for systemic stability. This is because in CCPs the main creditors – the clearing members – can actively gain from encouraging the CCP to reduce ex-ante investment in risk management through the reduction of the costs of the clearing services. In addition to reducing shareholder accountability of managers in general, the thesis argues that governance interventions can help gain traction to reduce systemic risk by transferring the responsibility for triggering the default procedure and applying post-default mechanisms in times of systemic stress from the managers of the CCP to the prudential authorities. The prudential authorities will be better placed to assess the impact of the CCP's actions on the system as a whole.

In addition to these concrete policy proposals, the thesis offers a general framework to analyse the role of governance regulation to gain traction to mitigate systemic risk in any type of financial institution. More specifically, the thesis offers the tools necessary to analyse future case studies in three ways. First, it identifies the overarching features that distinguish SIFIs from other

⁴³ ESMA, 'Final report Guidelines on sound remuneration policies under the AIFMD' (guidelines), 13, <https://www.esma.europa.eu/sites/default/files/library/2015/11/2013-201.pdf>; ESMA 'Guidelines on sound remuneration policies under the UCITS Directive' (Guidelines) ESMA/2016/575, 3, https://www.esma.europa.eu/sites/default/files/library/2016-575_ucits_remuneration_guidelines.pdf.

firms. Second, the thesis lays bare the circumstances under which corporate governance regulation can gain traction to mitigate systemic risk. More specifically, the importance of governance regulation is a function of at least three variables: competition regarding prudential requirements, the level of residual discretion of the regulated actors, and the locus of information. Third, it introduces the distinction between the incentives at the level of the business model and the incentives at the level of the agent of the business. The agent-level analysis looks at the alignment or lack thereof between the business model and the agent's incentives and its consequences for systemic risk. In doing so, the analysis can determine whether there is scope for regulating the systemic issues through governance interventions. In sum, the thesis lays out the analytical foundations for future research on the use of corporate governance regulation to control systemic risk in any type of systemically important financial institution.

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