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THE REGULATION OF HEDGE FUNDS: ENSURING FINANCIAL STABILITY THROUGH AIFMD'S MANDATORY DISCLOSURE REGIME

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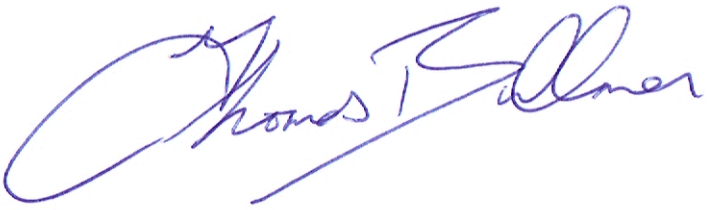
DECLARATION OF NON-PLAGIARISM

I declare that I have read and am aware of the obligations of the 2025-2026 Academic Integrity for Examinations and Assessments Policy of University College Cork, regarding academic integrity and plagiarism and confirm that I have not engaged in academic misconduct.

I declare that this thesis is the result of my own research, and that external references and sources are clearly acknowledged and identified.

I declare that this thesis has not been submitted in whole or in part for any other qualification or award, either at University College Cork or elsewhere.

I declare that I have independently carried out this research work and edited without the aid of any third party.



Signature: _____

THOMAS BULLMAN

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ABSTRACT

Hedge funds currently occupy a significant position within financial markets. Over the past 20 years, hedge funds have grown as a staple investment for pension funds, institutional and high net worth investors, and sovereign wealth funds. As an unrestricted form of asset management, hedge funds are able to earn above-average returns. Unrestrained investment practices, combined with widespread industry opacity, have become a concern for policymakers and regulators seeking to strengthen the financial system against systemic risk. Within the European Union, such concern was addressed through the implementation of the Alternative Investment Fund Managers Directive (AIFMD).[1] The central question of this research is whether or not AIFMD, in the pursuit of financial stability, actually achieves in practice what is provided for in the provisions of the legislation. This requires an analysis of how policy has translated into regulatory change, how such regulatory change is complied with, and ultimately how market practices are supervised. The conclusion of this research is that the element of real-time intervention is missing from the current regulatory mechanisms for identifying and combatting systemic risk. Hence, the outcome of this analysis is to make a two-fold proposal to ensure that the AIFMD mandatory disclosure regime (also known as a mandatory reporting regime) can actually deliver financial stability within the financial markets that hedge funds operate in: firstly, a proposed move to real-time mandatory disclosure for regulatees, and, secondly, a proposal for an upgraded supervisory circuit breaker framework that can be implemented into the national law of EU Member States, based on enhanced information-sharing coordinated by the European Securities Markets Authority (ESMA).

[1] Council Directive 2011/61/EU of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010 [2011] OJ L174/1.

LEGISLATION AND CASE LAW

European Union

Directives

Directive 85/611/EEC of the European Parliament and of the Council of 20 December 1985 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), [1985] OJ L375/3

Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), [2009] OJ L302/32

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 L176/42

Directive 2010/78/EU of the European Parliament and of the Council of of 24 November 2010 amending Directives 98/26/EC, 2002/87/EC, 2003/6/EC, 2003/41/EC, 2003/71/EC, 2004/39/EC, 2004/109/EC, 2005/60/EC, 2006/48/EC, 2006/49/EC and 2009/65/EC in respect of the powers of the European Supervisory Authority (European Banking Authority), the European Supervisory Authority (European Insurance and Occupational Pensions Authority) and the European Supervisory Authority (European Securities and Markets Authority), [2010] OJ L331/120

Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1

Directive 2014/57/EU of the European Parliament and of the Council of 16 April 2014 on criminal sanctions for market abuse (market abuse directive), [2014] OJ L173/179

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, [2014] OJ L173/349

Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions, [2014] OJ L257/186

Directive (EU) 2024/790 of the European Parliament and of the Council of 28 February 2024 amending Directive 2014/65/EU on markets in financial instruments, ELI: http://data.europa.eu/eli/dir/2024/790/oj

Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj

Regulations

Regulation (EC) No 1060/2009 of the European Parliament and of the Council of 16 September 2009 on credit rating agencies, [2009] OJ L302/1

Regulation (EU) No 1095/2010 of the European Parliament and of the Council 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 L331/84

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, [2012] OJ L201/1

Regulation (EU) No 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, [2013] OJ L83/1

Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012, [2014] OJ L174/84

Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1

Regulation (EU) 2017/104 of 19 October 2016 amending Delegated Regulation (EU) No 148/2013 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories with regard to regulatory technical standards on the minimum details of the data to be reported to trade repositories, [2017] OJ L 17/1

Regulation (EU) 2017/584 of 14 July 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards specifying organisational requirements of trading venues, [2017] OJ L87/350

Regulation (EU) 2017/587 of 14 July 2016 supplementing Regulation (EU) No 600/2014 of the European Parliament and of the Council on markets in financial instruments with regard to regulatory technical standards on transparency requirements for trading venues and investment firms in respect of shares, depositary receipts, exchange-traded funds, certificates and other similar financial instruments and on transaction execution obligations in respect of certain shares on a trading venue or by a systematic internaliser, [2017] OJ L87/387

Regulation (EU) 2019/363 of 13 December 2018 laying down implementing technical standards with regard to the format and frequency of reports on the details of securities financing transactions (SFTs) to trade repositories in accordance with Regulation (EU) 2015/2365 of the European Parliament and of the Council and amending Commission Implementing Regulation (EU) No 1247/2012 with regard to the use of reporting codes in the reporting of derivative contracts, [2019] OJ L 81/85

Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability‐related disclosures in the financial services sector, [2019] OJ L317/1

Regulation (EU) 2022/1860 of 10 June 2022 laying down implementing technical standards for the application of Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to the standards, formats, frequency and methods and arrangements for reporting, [2022] OJ L262/68

Regulation (EU) 2024/791 of the European Parliament and of the Council of 28 February 2024 amending Regulation (EU) No 600/2014 as regards enhancing data transparency, removing obstacles to the emergence of consolidated tapes, optimising the trading obligations and prohibiting receiving payment for order flow, ELI: http://data.europa.eu/eli/reg/2024/791/oj

Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) [2024] OJ L 1689, ELI: https://eur-lex.europa.eu/eli/reg/2024/1689/oj

European Commission, 'Proposal for a Regulation of the European Parliament and of the Council amending Regulations (EU) 2016/679, (EU) 2018/1725, (EU) 2022/2065 and (EU) 2023/2854 and Directives 2000/31/EC, 2011/93/EU and (EU) 2016/680 as regards measures to reduce administrative burdens and compliance costs for the implementation of Union law in the digital field' (Digital Omnibus on AI Regulation) COM(2025) 836 final.

Cases

Meroni & Co, Industrie Metallurgiche SpA v High Authority of the European Coal and Steel Community (Case 9/56) [1958] ECR 133 (CJEU)

Ireland

Acts

Finance Acts, 2003

Finance Act, 2005

Investment Funds, Companies and Miscellaneous Provisions Act, 2005

Investment Limited Partnership Act, 1994

Investment Limited Partnerships (Amendment) Act 2020

Unit Trust Act, 1990

United States

Acts

Dodd-Frank Wall Street Reform and Consumer Protection Act, 2010

Investment Company Act, 1940

Private Fund Investment Advisers Registration Act, 2010

Regulation D, Securities Act, 1933

Cases

Goldstein v SEC (2006) 451 F.3d 873

ABBREVIATIONS

AI	Artificial Intelligence
AIF	Alternative Investment Fund
AIFM	Alternative Investment Fund Manager
AIFMD	Alternative Investment Fund Managers Directive
AIFMR	Alternative Investment Fund Managers Regulation
ALFI	Association of the Luxembourg Fund Industry
AIMA	Alternative Investment Management Association
AML	Anti-Money Laundering
AUM	Assets Under Management
BMIS	Bernard L. Madoff Investment Securities LLC
BIC	Bank Identifier Code
BIS	Bank for International Settlements
CAPM	Capital Asset Pricing Model
CBDC	Central Bank Digital Currencies
CBI	Central Bank of Ireland
CCF	Common Contractual Fund
CCP	Central Counterparty
CDO	Collateralized Debt Obligation
CDS	Credit Default Swap
CEBS	Committee of European Banking Supervisors
CEIOPS	Committee of European Insurance and Occupational Pension Supervisors
CESR	Committee of European Securities Regulators
CFTC	Commodities Futures Trading Commission
CUSIP	Committee on Uniform Securities Identification Procedures numbers
DLT	Distributed Ledger Technology
DMA	Direct Market Access
D-SIFI	Domestically Systemically Important Financial Institutions
EBA	European Banking Authority

EC	European Commission
ECB	European Central Bank
ECOFIN	Economic and Financial Affairs Council
EIOPA	European Insurance and Occupational Pensions Authority
EMH	Efficient Market Hypothesis
EMIR	European Market Infrastructure Regulation
EP	European Parliament
ESA	European Supervisory Authority
ESFS	European System of Financial Supervision
ESG	Environmental, Social and Governance
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
ETL	Extract-Transform-Load
EU	European Union
FATF	Financial Action Task Force
FAQ	Frequently Asked Questions
FCA	Financial Conduct Authority
FSA	Financial Services Authority
FSAP	Financial Services Action Plan
FSB	Financial Stability Board
FSF	Financial Stability Forum
FSOC	Financial Stability Oversight Council
FTP	File Transfer Protocol
G-SIB	Globally Systemically Important Banks
G-SIFI	Globally Systemically Important Financial Institutions
G-SII	Globally Systemically Important Insurers
HFT	High Frequency Trading
HLI	Highly Leveraged Institutions
IAIS	International Association of Insurance Supervisors
IMF	International Monetary Fund

IOSCO	International Organization of Securities Commissions
ISIN	International Securities Identification Number
ITS	Implementing Technical Standards
LBHI	Lehman Brothers Holdings Inc
LEI	Legal Entity Identifier
LTCM	Long Term Capital Management
MAD	Market Abuse Directive
MES	Marginal Expected Shortfall
MiFID	Markets in Financial Instruments Directive
ML	Machine Learning
NAV	Net Asset Value
NBNI-SIFIs	Non Bank Non Insurer - Systemically Important Financial Institution
OECD	Organization for Economic Cooperation and Development
OTC	Over-the-counter
PWG	President's Working Group
QIAIF	Qualifying Investor Alternative Investment Fund
QIF	Qualifying Investor Fund
RIAIF	Retail Investor Alternative Investment Fund
RTS	Regulatory Technical Standards
SBAI	Standards Board for Alternative Investments
SEC	Securities and Exchange Commission
SES	Systemic Expe ted Shortfall
SFDR	Sustainable Finance Disclosure Regulation
SFT	Securities Financing Transaction
SFTR	Securities Financing Transactions Regulation
SIFI	Systemically Important Financial Institutions
SIU	Savings and Investments Union
SRISK	Systemic Risk
TBTF	Too-Big-Too-Fail
TR	Trade Repository

UCITS	Undertakings for Collective Investment in Transferable Securities
UTI	Unique Trade Identifier
UK	United Kingdom
US	United States
WAIFEM	West African Institute for Financial and Economic Management
VaR	Value-at-Risk
VAR	Vector Autoregression

INTRODUCTION

Within the asset management sector of the EU financial services industry, hedge funds occupy a significant position of risk and reward for investors. As unrestrained investment vehicles, hedge funds can take on high levels of risk while at the same time maintaining very low levels of transparency. Hedge funds are particularly secretive about their investment strategy, which is regarded as a form of intellectual property by hedge fund managers and which allows a hedge fund to make above-average returns. This has resulted in a complex relationship developing between systemic risk and the hedge fund industry.

An additional challenge is that the asset management industry has become increasingly interconnected as a result of increasing transactions in complex financial products. Hedge funds now interact with retail investment funds, banks, insurance and pension funds. Therefore, the concerns of hedge fund systemic risk are increasingly connected to other areas of the asset management industry. Technology makes the transacting of financial products and the transferring of risk between these market participants and within the asset management industry almost instant.

A key challenge for policymakers and regulators has been how to regulate hedge funds (in order to gain necessary data about their activities and to make systemic risk assessments), while not threatening hedge funds' commercial viability. The Alternative Investment Fund Managers Directive (AIFMD)[2] was the EU's first attempt at regulating the hedge fund industry. As part of AIFMD, a mandatory disclosure regime known as Annex IV was

[2] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1.

introduced. AIFMD II[3] is the update of the original regulatory measure. AIFMD II is currently in the process of going through the Lamfalussy Process levels of updating.[4] One significant area of updating involves requirements concerning timing, frequency and format of the mandatory disclosure regime. These updated rules are within the purview of ESMA to propose.

The primary purpose of this thesis is to assess the effectiveness of the regulation and supervision of hedge funds through the AIFMD mandatory disclosure regime, specifically in how the regime is mitigating and guarding against systemic risk. A mandatory disclosure regime requires regulated firms to report data sets concerning the activities that they engage in. The data sets are based on pre-determined criteria. The data disclosed by each regulated firm is aggregated to help in the identification and combatting of systemic risk. The central argument of this thesis is that the timing and the quality of data reported under AIFMD's mandatory disclosure regime are decisive to ensure the stated aims of AIFMD are achieved. The argument extends to enhancing the timing of report submission, pursuant to AIFMD mandatory disclosure requirements, in order to better identify systemic risk. Further, the thesis argues for the enhancement of existing circuit breaker mechanisms used to intervene in the market to combat systemic risk.

This Introduction commences with an outline of the thesis objectives. This includes a summary of the key research questions being investigated and a summary of the scope of the research. The second section will address the regulatory context and provide the rationale for

[3] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj.
[4] There are four levels in the Lamfalussy Process. Level 1 is a framework directive. Level 2 is a detailed regulation. Level 3 is guidelines, opinions and Q&A. Level 4 is supervisory convergence. For more on how this is applied to the regulation of hedge funds, see 4.2.

why this research is necessary. The third section will outline existing research in the area of hedge fund systemic risk regulation. This section will highlight the importance of this research and how it fits in with related areas of research and regulatory change. The fourth section will address the research methodologies adopted in this thesis. The fifth section sets out the structure of the thesis and explains the subject matter of each chapter.

Thesis objective

This thesis will address several key themes in achieving its objective of evaluating the efficacy of AIFMD's mandatory disclosure regime in delivering financial stability outcomes. The thesis will analyse the extent to which hedge funds represent a systemic risk within the asset management and wider financial system. As one of AIFMD's self-stated purposes is financial stability, this investigation will assess whether or not the AIFMD mandatory disclosure regime currently facilitates the identification of systemic risk by regulators. The research also addresses the issue of timely combatting systemic risk. In so doing, the thesis will examine how market intervention mechanisms can be used to combat systemic risk in real-time. An important aspect of this assessment will be to recognise how technological advancements can facilitate the changes necessary to enable the identification and combatting of systemic risk. To convey the main arguments of the research, the thesis will analyse the scope within AIFMD II or further reform, particularly through the mandate given to ESMA to draft Level 2 Regulatory Technical Standards (RTS) and Implementing Technical Standards (ITS).

This thesis will identify key areas where identification and combatting of systemic risk is arguably not being achieved. This thesis will propose enhancements to the EU's regulatory

and supervisory regimes governing the hedge fund industry. Where appropriate, such proposals will address the overlap of AIFMD with other EU regulatory regimes such as the Undertakings for Collective Investment in Transferable Securities (UCITS) Directive.[5] Such proposals will be focused on changes to the timing, frequency and format of the AIFMD mandatory disclosure regime, and will refer to the example of the circuit breakers provided for under the Markets in Financial Instruments Directive (MiFID) regime.[6]

To achieve these objectives, the thesis will set out a portrayal of the hedge fund industry within the EU, focusing on the characteristics of hedge funds. This will be followed by an analysis of the primary characteristics of systemic risk in the context of hedge funds. The thesis scrutinises how these features of systemic risk can be evinced in hedge fund activities. Examples of the relationship of systemic risk to hedge funds will be addressed. These include leveraging and opacity, which are key characteristics of hedge funds that are also firmly connected to systemic risk. The role of information disclosure regimes as a regulatory tool to effectively identify systemic risk will be analysed. AIFMD's mandatory disclosure regime will be introduced as the subject of assessment. Arising from this assessment, the thesis will make the argument for a proposed set of changes to the AIFMD and MiFID regimes, in order to move reporting and market intervention towards real-time.

[5] Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), [2009] OJ L302/32. Also, Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions, [2014] OJ L257/186.
[6] 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, [2014] OJ L173/349.

Key research questions and arguments

The central research question of this thesis is whether or not AIFMD's mandatory disclosure research robustly supports the ability of hedge fund regulation to deliver financial stability. To answer this, the thesis must assess the following issues: (1) What is the relationship between the hedge fund industry and systemic risk?; (2) How effective was AIFMD's mandatory disclosure regime – as originally drafted – in providing appropriate and timely data to effectively identify and combat systemic risk within the hedge fund industry?; and (3) What supervisory oversight and intervention improvements could be made by ESMA in developing RTS and Guidelines under AIFMD II to ensure that systemic risk is more effectively identified and combatted?

Based on the research, this thesis will argue that existing EU hedge fund regulatory measures are insufficient to effectively identify and combat systemic risk. Most importantly, this thesis will make proposals for improved measures within Level 2 of AIFMD II, as accomplished through the mandate of ESMA. Increased frequency of data submission will enable more effective and timely monitoring of systemic risks.[7] This thesis will also consider how updates to Level 2 AIFMD II may be reflected in other EU regimes. Based on the proposed increased timing and frequency of mandatory disclosure, the MiFID[8] circuit breaker regime could be updated. The MiFID regime could use the real-time information provided by the AIFMD mandatory disclosure regime to intervene in markets and dampen systemic risks. Such changes in supervisory structures would particularly help to identify and combat systemic

[7] A. McGarva, 'Keeping Up with the Joneses: A Model Systemic Risk Reporting Regime for the Canadian Hedge Fund Industry' (2015) 38(1) *Dalhousie Law Journal* 173.
[8] 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, [2014] OJ L173/349. Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012, [2014] OJ L174/84.

risk if the changes are mirrored across the wider funds industry. Therefore, the current legislative alignment between the AIFMD and UCITS[9] regimes under AIFMD II must progress towards alignment in the practical techniques used for market intervention.

Defining the scope: Boundaries of the thesis

For the purposes of this thesis, it is necessary to have a clear definition of the types of funds that this research focuses on. The term *hedge fund* is a sub-category within the Alternative Investment Fund (AIF) definition. Investment vehicles such as private equity funds, property funds, infrastructure funds and art will not be considered. These investment forms are fundamentally different to hedge funds in terms of their valuation, investor base, investment horizon, liquidity, and systemic importance. This research will address the difficulties in defining hedge funds and the impact that definitional ambiguities have had on effectively monitoring systemic risk. Notwithstanding these difficulties, the thesis takes the view that it is still possible to provide a sufficiently clear demarcation of hedge funds to allow for a focus on this category of AIF.

The boundaries of this research are further delineated by a focus on systemic risk. Systemic risk is the threat of economic paralysis in a market caused by the aggregation of irrational behaviour by market participants.[10] Systemic risk follows a pattern of transmission, accumulation and materialisation.[11] The characteristic which binds these three phases is the

[9] Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), [2009] OJ L302/32.
[10] A. Berger and J. Sedunov, 'The Life Cycle of Systemic Risk and Crises' (2024) 56(8) *Journal of Money, Credit, and Banking* 1923. N. Huck, H. Mavoori and O. Mesly, 'The Rationality of Irrationality in Times of Financial Crises' 89 (2020) *Economic Modelling* 337. A. Mansurov, 'Role of Systemic Risk in the Formation, Transmission, and Exacerbation of Economic Instability' (2013) 24(4) *Studies on Russian Economic Development* 366.
[11] T. Silva, M. Alexandre and B. Tabak, 'Bank Lending and Systemic Risk: A financial-Real Sector Network Approach with Feedback' (2018) 38 *Journal of Financial Stability* 98. M. Kranke and D. Yarrow, 'The Global

interconnectedness of financial market participants.[12] This thesis seeks to address the role of interconnectedness in systemic risk. The thesis also seeks to clarify the difference between the identification and combatting of systemic risk. Regulatory enhancements are necessary from both perspectives of identification and combatting.

As a limitation, or borderline, to the boundaries of the thesis, the thesis does identify various potential supervisory enhancements, but the thesis does not address these possibilities in detail. Instead, the thesis concentrates on advocating for real-time reporting as a regulatory enhancement to effectively identify systemic risk. Enhancements to existing circuit breaker mechanisms under EU regulations will be proposed as an appropriate supervisory enhancement to combat systemic risk. However, details of the technological challenges of implementing real-time reporting through live feeds are beyond the focus of this research, since the research is primarily preoccupied with legal and regulatory questions. Similarly, this research will not propose exhaustive descriptions of the technical workings of circuit breakers. The research can only give a snapshot in time as to which technologies might be suitable to move reporting to real-time and to implement change to existing circuit-breakers. Over time, it can be expected that various technical features of pull and push technology for reporting or circuit breakers will be trialled and modified. Some technologies or approaches will be rejected as being unfeasible options to progress with, whilst others may move in new directions.

Regulatory context and rationale for research

Governance of Systemic Risk: How Measurement Practices Tame Macroprudential Politics' (2019) 24(6) *New Political Economy* 816.

[12] M. Hamdaoui, 'Liberalization, Regulatory Delays and Vulnerability to Systemic Banking Crisis' (2017) 31(4) *International Economic Journal* 490.

Hedge funds are an unrestrained form of asset management. As will be demonstrated in Chapter 1, hedge funds use investment practices of short-selling, leveraging, and arbitrage to outperform the market. Post the global financial crisis, hedge funds have been the subject of specific reforms in financial regulation because of their proximity to systemic risk concerns. These concerns arise because of hedge funds being investors and counterparties to the trading of securitised products, which were collateralised by mortgages or other types of debt. The buying and selling of these products with the banking industry has increased the connectedness between hedge funds and banks. This connectedness is a fundamental driver of systemic risk. Furthermore, the systemic threats of the hedge fund industry have not been fully mitigated due to the opacity and secrecy of hedge fund investment practices and strategies.

Almost two decades after the global financial crisis, complexity continues to be a key component in systemic risk. The complexity relates to products, practices and the associated entities that control and transact in these products. This complexity is connected to existing global pressures within financial markets and is continuing to have an increasingly destabilising effect on financial markets.[13] Moreover, complexity is often related to hedge funds' unrestrained asset management activities.[14] International financial reform continues to focus on the strengthening of the financial system and the prevention of risks to financial stability. In 2011, the EU hedge fund industry became regulated pursuant to AIFMD.[15] A principal rationale for AIFMD's introduction was to provide for the 'effective monitoring of

[13] F. Ghallabi, A. Ghorbel, and S. Karim, 'Decoding Systemic Risks Across Commodities and Emerging Market Stock Markets' (2025) 11(47) *Financial Innovation* 1.
[14] N. Moloney, E. Ferran, and J. Payne (eds), *The Oxford Handbook of Financial Regulation* (Oxford: OUP, 2015) 1.
[15] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1. Regulation (EU) No 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, [2013] OJ L 83/1.

systemic risk.'[16] AIFMD introduced an EU regime aimed at regulating the hedge fund industry via a disclosure regime. This disclosure regime mandates the reporting of systemically relevant data sets concerning the positions and practices of reporting hedge fund managers and funds.[17]

The complexity of the hedge fund industry and its practices is reflected in the complexity of the EU regulatory framework for hedge funds. AIFMD is the first Directive that ESMA was responsible for implementing. AIFMD also regulates Alternative Investment Fund Managers (AIFMs) directly, but indirectly regulates Alternative Investment Funds (AIFs), administrators, depositaries and delegates. Further, existing investment fund regimes, such as the Undertakings for Collective Investment in Transferable Securities (UCITS)[18] regime, are product regulations, but AIFMD regulates the product manager. Hence, comparability and alignment between parallel regulatory regimes can be challenging.

Relationship of thesis to existing scholarship

Much research has been undertaken into systemic risk and its regulation. Systemic risk has been the subject of extensive academic and industry research from economic, risk and regulatory perspectives. Much of the regulatory research into systemic risk focuses on

[16] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, recital 90.

[17] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24.

[18] Directive 85/611/EEC of the European Parliament and of the Council of 20 December 1985 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), [1985] OJ L375/3. The initial UCITS Directive was repealed and updated several times and is now in the form of UCITS V - Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions, [2014] OJ L257/186.

specific sectors of the financial market, rather than the relationship between different segments of the market.[19] There is ample research which seeks to analyse systemic risk after materialisation has already occurred. However, research does not often examine the phases of systemic risk as part of the process of identifying and combatting systemic risk in real-time prior to materialisation.[20]

Capital adequacy metrics, risk monitoring frameworks, and remuneration formulas have all been researched and their systemic risk identification and combatting merits assessed.[21] However, the focus of this thesis is on another form of regulation to protect against systemic risk – mandatory disclosure rules. There is also an abundance of research on the characteristics of mandatory disclosure regimes, but the research often focuses on the impact of mandatory requirements in terms of data received, as opposed to voluntarily required.[22] The originality of this thesis is that it focuses on analysing the relationship between the identification and combatting of systemic risk and mandatory disclosure. Further, the thesis

[19] U. Krüger, C. Roling, L. Silbermann and L. Wong, 'Bank's Strategic Interaction, Adverse Price Dynamics and Systemic Liquidity Risk' (2025) 26(1) *Journal of Banking Regulation* 1. B. Srbinoski, K. Poposki and V. Bogdanovski, 'Interconnectedness of European Insurers and Cat Shocks Contagion Effects' (2024) 32(3) *Journal of Financial Regulation and Compliance* 379. J. De Smet, 'Article: The Systemic Importance of Asset Managers: A Case Study for the Future of SIFI Regulation' (2024) 35(2) *European Business Law Review* 227.

[20] M. Bodellini, 'Bank Crisis Management in the UK: Lessons Learnt from the Failure of Silicon Valley Bank and the Government's Proposal to Enhance the Special Resolution Regime' (2025) 26(1) *European Business Organization Law Review* 27. A. Malmstrom Rognes and M. Larsson, 'Can Regulations Prevent Financial Crises? Uses of the Past in the Evolution of Regulatory Reforms in Sweden' (2023) 31(4) *Journal of Financial Regulation and Compliance* 469.

[21] M. Brunnermeier, S. Rother and I. Schnabel, 'Asset Price Bubbles and Systemic Risk' (2020) 33(9) *The Review of Financial Studies* 4272. Also, D. Awrey and K. Judge, 'Why Financial Regulation Keeps Falling Short' (2020) 61(7) *Boston College Law Review* 2303. J. Bats and A. Houben, 'Bank-Based versus Market-Based financing: Implications for Systemic Risk' (2020) 144 *Journal of Banking and Finance* 1. E. Lin, E. Sun and M. Yu, 'Systemic Risk, Financial Markets, and Performance of Financial Institutions' (2018) 262 *Annals of Operatiosn Research* 579. S. Benoit, J. Colliard, C. Hurlin and C. Pérignon, 'Where the Risks Lie: A Survey on Systemic Risk' (2017) 21(1) *Review of Finance* 109. T. Silva, M. Alexandre and B. Tabak, 'Bank Lending and Systemic Risk: A Financial-Real Sector Network Approach with Feedback' (2018) 38 *Journal of Financial Stability* 98. M. Kranke and D. Yarrow, 'The Global Governance of Systemic Risk: How Measurement Practices Tame Macroprudential Politics' (2019) 24(6) *New Political Economy* 816.

[22] J. Seligman, 'The Historical Need for a Mandatory Corporate Disclosure System' (1983) 9(1) *The Journal of Corporation Law* 1. L. Enriques and S. Gilotta, 'Disclosure and Financial Market Regulation' in N. Moloney, E. Ferran, and J. Payne (eds), *The Oxford Handbook of Financial Regulation* (OUP 2015) 519. O. Ben-Shahar and C. Schneider, 'The Failure of Mandated Disclosure' (2011) 159(3) *University of Pennsylvania Law Review* 647, 681-4.

specifically investigates the roles of time, frequency and format in systemic risk identification and how these factors may help in combatting systemic risk through qualitatively enhanced circuit-breaker trigger metrics in non-equity markets. This is the concept of generating actionable intelligence. For the purposes of this thesis, actionable intelligence, or actionable supervisory insight, can be viewed as the gathering and structuring of data to inform and to support timely decision-making by a supervisor.

An evolving area of research is how technology can legitimately enable regulatory reforms. Existing research has focused on FinTech, RegTech and SupTech from both the regulator and regulatee perspectives.[23] The thesis makes an original evaluation of the merits of using technology in moving to real-time reporting through a pull-based live feed of data to identify systemic risk. The thesis envisages this pull-based live feed as being facilitated by a corresponding real-time intervention mechanism with qualitative trigger metrics to combat systemic risk. The thesis therefore, builds on the existing systemic risk regulatory scholarship in three principal ways: (1) The thesis considers the relationship between the timing of reporting and the ability to identify and combat systemic risk, while addressing the evolution of this relationship. The thesis thereby focuses on the potential of real-time reporting – the new frontier of information-based regulation; (2) The thesis examines the applicability of qualitative factors in circuit-breaker mechanisms; and (3) the thesis accounts for how technology can help facilitate the change in regulation at what is a hinge point in the relationship between regulation and technology.

[23] H. Hofmann, D. Zetzsche, and F. Pflücke, 'The Changing Nature of 'Regulation by Information': Towards Real-Time Regulation?' (2022) 28 *European Law Journal* 172. D. Arner, J. Barberis and R. Buckey, 'FinTech, RegTech, and the Reconceptualization of Financial Regulation' (2017) 37(3) *Northwestern Journal of International Law & Business* 376, 382. S. Zeranski and I. Sancak, 'Prudential Supervisory Disclosure (PSD) with Supervisory Technology (SupTech): Lessons from a FinTech Crisis' (2021) 18 *International Journal of Disclosure and Governance* 315. J. McCarthy, 'The Regulation of RegTech and SupTech in Finance: Ensuring Consistency in Principle and in Practice' (2023) 31(2) *Journal of Financial Regulation and Compliance* 186.

The first review of the effectiveness of AIFMD was published in June 2020,[24] with further public consultation undertaken afterwards.[25] By conducting the review and consultation, the European Commission echoed the regulatory-enhancing recommendations for liquidity and leverage monitoring previously made by the European Systemic Risk Board (ESRB). These recommendations concern the calculation of leverage but not the frequency of reporting such data.[26] The Commission also addressed the supervisory challenges across national competent authorities and recommended that the regulatory reporting template needed to be updated to assist in supervision.[27] However, the report did not contain any assessment of certain key issues, such as *inter alia*: the relationship of reporting frequency to systemic risk monitoring; the lack of reporting firms self-identifying as hedge funds; the challenge of managing and extracting actionable supervisory insights from submitted data at national or EU level; or how action could be taken to combat systemic risk. In making a contribution to existing academic scholarship and commentary, this research will focus on those issues, in addition to re-appraising the understanding of systemic risk in the hedge fund industry, and proposing further development of the mandatory disclosure regime under AIFMD II.

As the Level 1 text of AIFMD II has been adopted, there is a current opportunity for ESMA to formulate Level 2 RTS and ITS to enhance the timing, frequency and format of regulatory reporting. The updating of several other directives, including UCITS and MiFID, is also

[24] European Commission, 'Report from the Commission to the European Parliament and the Council assessing the application and the scope of Directive 2011/61/EU of the European Parliament and of the Council on Alternative Investment Fund Managers' (19 June 2020); available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0232&from=EN (date accessed: 3 January 2026).
[25] European Commission, 'Financial services – review of EU rules on alternative investment fund managers'; available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12648-Alternative-Investment-Fund-Managers-review-of-EU-rules/public-consultation (date accessed: 3 January 2026).
[26] Recommendation of the European Systemic Risk Board of 7 December 2017 on liquidity and leverage risks in investment funds ESRB/2017/6, 2018/C 151/01. Letter of 3 February 2020 to DG FISMA from the ESRB on its considerations regarding the AIFMD.
[27] European Commission, *supra* note 23, 7-8.

being undertaken. Alignment between these directives is currently underway. This offers ESMA the opportunity to update the UCITS disclosure regime and the MiFID circuit-breakers to ensure that a more holistic improvement can be made in the architecture to identify and combat systemic risk at the asset management industry level. ESMA's mandate to propose timing, frequency and format changes represents a once-in-a-decade opportunity. ESMA has the power to introduce regulations to give effect to AIFMD's self-stated purpose by introducing real-time reporting and market intervention through existing circuit-breaker regimes to effectively identify and combat systemic risk.

Methodology

This thesis primarily utilises a doctrinal research methodology. There are also clear socio-legal aspects to the research methodology, and a socio-legal research approach will therefore also be applied. This research will principally examine theories in light of their relevance to practice or 'law in action'. This section of the Introduction provides an overview of how the salient features of these research methods are applicable to the thesis.

Doctrinal

Doctrinal research is predominantly concerned with substantive rules of law and legal doctrines. The focus of this research method is on how legal doctrine has been developed and applied. As such, doctrinal research represents a conceptual analysis. Doctrinal research is a theoretical discipline that involves the systematic analysis of case law, statutes and rules.[28] It seeks to reflect the description of Hutchinson and Duncan:

[28] V. Gawas, 'Doctrinal Legal Research Method A Guiding Principle in Reforming the Law and Legal System Towards the Research Development' (2017) 3(5) *International Journal of Law* 128.

> ‘But the doctrinal research methodology is much more than ‘scholarship’. It is the location and analysis of the primary documents of the law in order to establish the nature and parameters of the law. That is the crux of the doctrinal method. The ‘screening criteria’ for legal primary materials are necessarily more rule bound and intricate. Doctrinal research also requires a trained expert in legal doctrine to read and analyse the law — the primary sources: the legislation and case law. Doctrinal research is not simply the locating of secondary information. It includes that intricate step of ‘reading, analysing and linking’ the new information to the known body of law. Doctrinal research is centred on the reading and analysis of the primary sources of legal doctrine. It seeks to achieve more than simply a description of the law.’[29]

Doctrinal legal research can have a practical dimension and not just represent a set of rules. The doctrinal legal research in this thesis places an emphasis on law in practice as opposed to reviewing normative rules and principles under a purely academic discipline.[30] A doctrinal methodology follows a two-part process. It involves identifying the applicable law and then evaluating it.[31] In this regard, the doctrinal methodology is a critical element of the framework applied to this thesis in seeking to understand the rule and application of AIFMD and its mandatory disclosure regime. However, this research is seeking to do more than a textual analysis of the law surrounding hedge funds. The methodology is interdisciplinary and is informed by subjects such as economics and regulation. Economic models of information within financial markets and regulatory theory of mandatory disclosure are significant aspects of this research.

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[29] T. Hutchinson and N. Duncan, ‘Defining and Describing What We Do: Doctrinal Legal Research’ (2012) 17(1) *Deakin Law Review* 101.
[30] *Ibid.*
[31] *Ibid.*, 110.

This thesis will also adopt a reform-oriented methodology, which encapsulates an initial recognition that change is necessary to an existing rule. The rationale for reform must be supported by the research findings, and the research must indicate the most suitable means of implementing this reform. A reform-oriented approach requires care in avoiding pre-empting research conclusions and in guarding against confirmation bias.[32] Therefore, a thorough assessment of the adequacy of existing rules is followed by recommendations for change. The key to such a methodology is focusing on outcomes and then recommending the introduction of system-wide reforms that better lead to those outcomes. It is an outcome-focused format that this research will press for in arguing how ESMA could propose changes at Level 2 of AIFMD II.

Socio-Legal

Interdisciplinary research increasingly leans more heavily on the socio-legal methodology, where rules of law are analysed with the additional context of relationships, impacts, and connections to other disciplines.[33] 'Socio' refers to the context within which the law exists. [34] The research in this thesis is aligned with the socio-legal methodology, which at times can appear to be at the opposite end of the spectrum to the doctrinal approach. However, it is the addition of a contextual discussion to a doctrinal approach, accounting for influences of behavioural economics, that assists this research.[35]

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[32] T. Hutchinson, 'The Doctrinal Method: Incorporating Interdisciplinary Methods in Reforming the Law' (2015) 8(3) *Erasmus Law Review* 9.
[33] R. Banakar and M. Travers (eds), *Theory and Method in Socio-Legal Research* (Oxford: Hart Publishing, 2005).
[34] *Ibid.*
[35] *Ibid*., xii. C. McCrudden, 'Legal Research and the Social Sciences' in M. Del Mar and M. Giudice (eds.), Legal Theory and Social Sciences (Volume II) (London: Routledge, 2010). Banaker and Travers predict that socio-legal studies can have a transformative impact when they say '[w]e hope that the chapters in this volume demonstrate that social scientific studies of law can break new grounds and become a serious contender to the

A socio-legal methodology will be employed in the evaluation of hedge fund regulation. Hedge funds are inextricably linked to the real economy. Policymaker concerns are often based on social considerations, such as the removal of opacity or complex risk. EU law has long been viewed as a primary focus of socio-legal research where societal issues can influence policy decisions and development.[36] Elements of behavioural economics, financial economics and sociology will be taken into consideration in the proposal of real-time solutions and methods of intervention in active markets. However, this is a support to the predominant doctrinal approach of this research.

Thesis structure

This thesis will be divided into five substantive chapters, which will be followed by a conclusion. Chapter 1 will focus on the nature of hedge funds. This chapter will set out a profile of the hedge fund industry by assessing what a hedge fund is and what a hedge fund does. In reviewing what a hedge fund is, the chapter will look at two specific dimensions – the cross-border character and the key actors within the hedge fund industry. In reviewing what a hedge fund does, the unique investment characteristics of a hedge fund will be assessed. The fee structure, profit objective, investment practices of short-selling and leveraging, and the hedge fund strategy all form part of what is unique about hedge funds.

Chapter 2 will focus on the issue of systemic risk as it is created through the use of leverage. This chapter seeks to examine the relationship between hedge fund leverage forms and

traditional forms of legal research first, and only if, they develop a genuine awareness of the consequences of social scientific debates for their research practices.'

[36] V. Gessner and D. Nelken, *European Ways of Law: Towards a European Sociology of Law* (Oxford: Hart Publishing, 2007).

systemic risk. This will be accomplished through a deeper assessment of (1) how hedge funds access different forms of synthetic leverage, (2) how this leverage increases portfolio risk at a micro-level, and (3) how the accumulation and transmission of individual hedge fund leverage and portfolio risk contribute to systemic risk at a macro-level.

Chapter 3 will focus on the use of information-based disclosure as the regulatory tool most applicable to identifying systemic risk. This chapter will assess the position of information within financial markets and how mandatory disclosure regimes operate. This chapter will conclude that mandatory disclosure regimes can only help achieve systemic risk outcomes if they operate a real-time reporting frequency, and are aligned with other mandatory disclosure regimes in other sectors and countries, as systemic risk is a cross-sector global risk. This issue will be further developed in Chapter 5.

Chapter 4 will focus on the AIFMD mandatory disclosure regime, including the changes that have been introduced by the recent Level 1 AIFMD II amendments. This chapter will be divided into two parts. The first part will introduce AIFMD as the foremost EU disclosure framework impacting hedge fund activities and focus on explaining the Annex IV mandatory disclosure regime. The second part of the chapter will introduce the changes that have been made to the mandatory disclosure regime through the agreement reached in the Level 1 text of AIFMD II.

Chapter 5 will make two proposals regarding how AIFMD's mandatory disclosure regime should be developed. The effect of these proposals would be to enhance and further strengthen AIFMD's ability to achieve its aim of identifying and combatting systemic risk. The first proposal will be to move the timing and frequency of reporting under the AIFMD mandatory disclosure regime to real-time through the use of evolving RegTech solutions. This will facilitate more effective identification of systemic risk. The second proposal will be to update the existing MiFID circuit breaker regime to more appropriately intervene in the market based on hedge fund considerations. This can be achieved through the use of evolving SupTech solutions and will facilitate more effective combatting of systemic risk.

The conclusion to this thesis will reiterate the findings of this research, make some final observations, and make recommendations for change by ESMA at Level 2 of AIFMD II. It will also address timing considerations that ESMA will be bound by. Finally, it will identify avenues for future research in order for the recommended changes to be introduced.

Chapter 1 DISTINGUISHING THE HEDGE FUND SECTOR

1.1. Introduction

In order for this thesis to evaluate any rules introduced by the Alternative Investment Fund Managers Directive (AIFMD),[37] it is first necessary to disentangle the complexity concerning what hedge funds are, what they do, and how this complexity is unique compared with other sectors of the investment industry. Therefore, the purpose of this chapter is to set out a profile of the hedge fund industry by assessing *what a hedge fund is* and *what a hedge fund does*. The fee structure, profit objective, investment practices of short-selling and leveraging, and the hedge fund strategy all form part of what is unique about hedge funds. This chapter will review these characteristics from the perspective of how they combine to define a hedge fund. The argument of this chapter is that the unrestrained speculative synthetic leveraging practice of the hedge fund industry has become its uniquely defining characteristic and systemic threat.

This chapter will be divided into five parts to simplify the complexity and highlight the synthetic leverage practice within the hedge fund industry. Part 1.2 will describe the intrinsic complexity and distinguishing elements of hedge funds. Part 1.3 will explain the cross-jurisdictional character of the hedge fund industry, and this often includes an onshore and offshore element. The key drivers behind this international structure will be outlined. The purpose of this section is to explain *why* a hedge fund is structured internationally. Part 1.4 will use Ireland as the EU case study of *how* a hedge fund is structured and serviced. The

[37] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1. This directive will be discussed in detail in Chapter 4.

purpose of this part is to describe and clarify the operational structure of a hedge fund. The first two sections of this part will address *what a hedge fund is*. Part 1.5 will analyse the distinguishing investment characteristics of the hedge fund industry through hedge funds' unique objectives, practices and strategies. The purpose of this part will be to explain what a hedge fund does that is different from all other sectors of the investment industry, as a foundation for demonstrating how hedge funds are systemically risky. Part 1.6 will provide a synopsis of how the practice of unrestrained synthetic leveraging has evolved as the defining characteristic of the hedge fund industry. The purpose of this part is to demonstrate the focus that the hedge fund industry now places on synthetic leveraging, and to lay a foundation for Chapter 2's analysis of hedge fund synthetic leveraging as a systemic risk. Therefore, together, parts 1.5 and 1.6 will address *what a hedge fund does*.

1.2. A complex investment vehicle

The hedge fund industry is complicated in its structure and operation. It has been cited as the most complex sector in the investment industry, trading in the most complex derivatives and structured products.[38] The nexus of this complexity relates to the unique international structuring, objectives, proclivities and practices associated with the industry. As an unrestrained form of asset management, the hedge fund industry has the freedom to move between equity and debt securities markets, searching for investment opportunities.[39]

[38] A. Blundell-Wignall, 'An Overview of Hedge Funds and Structured Products: Issues in Leverage and Risk' *OECD Financial Market Trends*, N°92, Vol. 2007/1, 40, available at: https://www.oecd.org/finance/financial-markets/40972327.pdf (date accessed: 12 October 2025). M. Getmansky, P. Lee, and A. Lo, 'Hedge funds: a dynamic industry in transition' *National Bureau of Economic Research Working Paper* (2015), 2, available at: https://www.nber.org/system/files/working_papers/w21449/w21449.pdf (date accessed: 3 January 2026). It has also been cited that the only more complex asset class in the investment industry is a replicated fund which attempts to mirror a hedge fund. See J. Hasanhodzic and A. Lo, 'Can Hedge-Fund Returns be Replicated: The Linear Case' (2007) 5 *Journal of Investment Management* 5.

[39] Consequently, hedge funds have become the dominant player in many fixed-income and derivative markets. See J. Cunliffe, 'The impact of leveraged investors on market liquidity and financial stability' Bank of England speech at the Managed Funds Association Global Summit 2020, 12 November 2020, 5, available at: https://www.bis.org/review/r201117g.pdf (date accessed: 3 January 2026). V. Agarwal, K. Mullally, and N.

Therefore, hedge funds have become a dominant participant in markets such as the US Treasury market.[40] As the market-based finance model has evolved over the past decade, hedge funds have sought access to greater and more sophisticated leverage levels to magnify performance and profitability. Hence, leverage has led to concerns over the systemic impact of hedge funds within financial markets.

Historically, hedge funds made significantly higher returns for investors than traditional investment options, though the extent of profitability has decreased as the industry has grown because there is only a finite universe of opportunities for investment.[41] Hedge funds remain a highly valued investment option. Proponents of the hedge fund industry have cited the symbiotic relationship between the hedge fund industry and the broader financial market to which hedge funds provide liquidity. However, hedge funds do not come without their risks. Critics have frequently characterised the relationship between hedge funds and financial markets as parasitic or vulture-like.[42] The contention is that hedge funds often capitalise on periods of financial distress amongst market participants, thereby exacerbating market volatility. Such perceptions and criticisms have resulted in hedge funds being accused of profiting from systemic weaknesses. Nevertheless, some scholars and practitioners argue that hedge funds fulfil important functions within financial markets – including the provision of

Naik, Narayan, 'Hedge Funds: A Survey of the Academic Literature' (2015) Foundations and Trends in Finance, Forthcoming, 77-91, available at: https://ssrn.com/abstract=2650919 (date access: 12 October 2025).

[40] In 2019 12 per cent of the outstanding US Treasury market securities were held by open-ended mutual funds and 9 per cent was held by hedge funds. See N. Liang and P. Parkinson, 'Enhancing Liquidity of the U.S. Treasury Market Under Stress' (2020) *Hutchins Center Working Paper* #72, 6, available at: https://www.brookings.edu/wp-content/uploads/2020/12/WP72_Liang-Parkinson.pdf (date accessed: 3 January 2026). This is partly due to the increasing trend of hedge funds pledging US Treasury securities as security for repo financing transactions.

[41] N. Metzger and V. Shena, 'Hedge Fund Performance during and after the Crisis: A Comparative Analysis of Strategies 2007–2017' (2019) 7 *International Journal of Financial Studies* 15.

[42] E. Beneze, 'Stopping the Circling Vultures: Restructuring a Solution to Sovereign Debt Profiteering.' (2021) 49 *Vanderbilt Journal of Transnational Law* 245. L. Wozny, 'National Anti-Vulture Funds Legislation: Belgium's Turn.' (2017) 2 *Columbia Business Law Review* 697.

liquidity and the facilitation of price discovery – thus complicating any purely negative assessment of their purpose and role within financial markets.[43]

The regulation of hedge funds has been a perennial concern. EU regulators have previously sought a compromise between opposing stances regarding hedge funds in assessing the options to regulate hedge funds. In recognising the benefits that hedge funds bring to financial markets, regulators have sought to advance proposals that increase mass-market distribution as part of a plan to grow the entire EU investment funds industry.[44] However, in 2011, after the global financial crisis and severe political pressure, the EU brought the burgeoning sector within the regulatory net under a new AIFMD passport regime, which was to be applicable to all unregulated fund managers and the funds that they manage.[45] This shift was driven by the fact that the crisis exposed the limited transparency and potential systemic risks associated with lightly regulated alternative investment vehicles such as hedge funds. Politically, policymakers faced public and institutional pressure to tighten oversight of the shadow banking sector and ensure that significant and opaque market participants were subject to regulatory oversight.

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[43] See comments of Deputy M. Collins, Deputy M. Fitzmaurice, and Deputy R. Barrett, Dáil Éireann debate - Thursday, 28 Jan 2021 Vol. 1003 No. 6, 'Response of the Department of Housing, Local Government and Heritage to Covid-19: Statements', available at: https://www.oireachtas.ie/en/debates/debate/dail/2021-01-28/6/ (date accessed: 3 January 2026).

[44] See EC Expert Group Report on Alternative Investment Group of July 2006, a seminal report commissioned to assess the future development of the European funds industry. Although the European Commission asked the question of bringing hedge funds under the UCITS regime, only a minority of the appointed industry experts to the group agreed with the proposal, available at: http://www.efmlg.org/Docs/Meeting%2021/Item%208a%20Report%20of%20the%20Alternative%20Investment%20Expert%20Group%20July%202006.pdf (date accessed: 3 January 2026). The author of this thesis was involved in contributing to this report as the assistant to the Irish appointed Expert Group member Neil Donnelly.

[45] For an explanation of the evolution of the Alternative Investment Fund Managers Directive see P. Athanassiou and T. Bullman, 'The EU's AIFM Directive and its Impact – An Overview' in P. Athanassiou (ed.) *Research Handbook on Hedge Funds, Private Equity and Alternative Investments* (Cheltenham: Edward Elgar Publishing Limited, 2013).

1.3. The cross-jurisdictional structure of the hedge fund industry

Due to the evolution of the offshore hedge fund industry, it is necessary for this chapter to clarify how the cross-border activities of the hedge funds are structured. Within a hedge fund structure, there are several key actors. The hedge fund is generally managed by a management company, which appoints an investment manager to make investment decisions, a depositary to safeguard the assets, an administrator to value the hedge fund, and a prime broker to help execute the hedge fund's trading strategy. However, these actors are generally domiciled in different jurisdictions, both onshore and offshore, from an EU perspective.[46] The purpose of this part is to explain the basis upon which a hedge fund selects a domicile. The first section will outline the key drivers behind the cross-jurisdictional structure of a hedge fund. The second section will explain the impact that recent EU regulatory and political changes have had on the decision of hedge funds to migrate from offshore to onshore domiciles.

1.3.1 The structural influence of tax

A distinctive feature of most hedge funds is their cross-jurisdiction operational structure.[47] The key driver behind this feature is tax. Three key tax issues exist in relation to the cross-border design of a hedge fund: firstly, the taxation of the hedge fund; secondly, the taxation of the hedge fund's investment manager; and thirdly, the taxation of the investors in the hedge fund. Different jurisdictions have different tax rules that apply to these three

[46] ESMA, *EU Alternative Investment Funds*, (2021) ESMA Annual Statistical Report 25; available at: https://www.esma.europa.eu/sites/default/files/library/esma50-165-1734_asr_aif_2021.pdf (date accessed: 3 January 2026).

[47] H. Nabilou, 'Regulatory Arbitrage and Hedge Fund Regulation: The Need for a Transnational Response' (2017) 22 *Fordham Journal of Corporate & Financial Law* 559. The hedge fund sector has been categorised as offshore because even though its funds may be distributed within the EU, its operational structure is often spread amongst several global tax-havens.

groups. This allows jurisdictional arbitrage to reduce what is known as 'tax drag' on fund performance.[48]

Concerning the first tax issue, offshore tax-efficient jurisdictions are preferred to onshore options so that hedge fund profits will not be subject to tax, or instead subject to a very low level of tax, on trading or gains. Once a hedge fund decides to domicile offshore, it must determine in which offshore jurisdiction to seek authorisation. Making this decision generally comes down to the regulatory regime and reputation of the offshore regulator. This decision shows how tax and regulatory drivers combine to influence the structuring of a hedge fund. Regulatory considerations include the cost and speed of authorisation and the ongoing regulatory compliance burden of the regulator.[49]

The second tax consideration relates to the hedge fund's investment manager. This entity is generally based in the UK or the US and executes an investment activity for the hedge fund. Most investment managers are domiciled outside the EU.[50] Therefore, the overarching consideration is whether the UK or US investment manager could act in such a way that the hedge fund is brought within the scope of UK or US tax authorities. This could result in the hedge fund losing the tax-efficiency benefit of being domiciled in a tax-efficient jurisdiction. The determining factor in deciding whether or not UK or US tax rules apply to a non-resident hedge fund is whether, in reality, the hedge fund is centrally controlled from the UK or the US. The fund will be taxed in accordance with the rules of the jurisdiction from which it is controlled. Therefore, day-to-day operational control of a hedge fund must always be retained

[48] M. Brocard and F. Lhabitant, *A Primer on the Tax Framework of Offshore and Onshore Hedge Funds* (2016) EDHEC Risk Institute Paper 8.
[49] D. Gabbert and A. Wylie, 'Taxation – An Overview' in D. Gabbert and A. Wylie, *The Law of Hedge Funds: A Global Perspective* 2nd ed., (London: LexisNexis, 2018).
[50] 80% of hedge fund managers in Europe are based in the UK according to House of Lords European Union Committee 3rd Report of Session 2009–10, Volume I: Report, Directive on Alternative Investment Fund Managers, 16.

by the board of the hedge fund and never be undertaken by the investment manager. The investment manager must not act in such a way that it is seen to constitute a permanent establishment of the fund or a representative of investors.[51]

The third tax consideration relates to investors and how the hedge fund structure will impact those investors from a tax perspective. Although each investor must do their own tax assessment before investing, a hedge fund will seek to domicile in a jurisdiction that will give the hedge fund distribution capabilities to investors in a target market.[52] In effect, a hedge fund will only domicile in a jurisdiction in which it is allowed to have 'distributor' status in the target jurisdiction. Otherwise, it will not be appealing to investors from a taxation perspective. Post-AIFMD, many offshore funds based in Cayman and BVI have redomiciled into the EU through Ireland and Luxembourg. This has allowed the funds to gain access to EU target markets that would otherwise be unappealing to investors from a tax perspective.[53]

In order to demonstrate the impact that these tax considerations have had on the domiciliation of the hedge fund industry, it is beneficial to look to the International Organization of Securities Commissions (IOSCO) annual survey of the industry. A 2020 survey shows that by Assets Under Management (AUM) of survey respondents, the Cayman Islands is the domicile of 49 per cent of hedge funds, followed by 30 per cent in the US. The next domiciles of choice are Ireland and Luxembourg, at 6 per cent each.[54] However, Irish Funds' data shows that Ireland is the servicing domicile of 40% of the global hedge fund AUM.[55]

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[51] *Ibid*.
[52] *Ibid*.
[53] S. Firth, 'Global Trends In Hedge Fund Domiciliation' IFC Review, 7 November 2023. M. Browne, 'Redomiciling Offshore Investment Funds to Ireland, the European Gateway' *Private Equity Law Report*, 4 March 2011.
[54] IOSCO, Report on the Fifth IOSCO Hedge Funds Survey : Final Report, April 2020, 7, available at: https://www.iosco.org/library/pubdocs/pdf/IOSCOPD653.pdf (date accessed: 3 January 2026).
[55] Irish Funds, Irish AIFs: A guide to establishing Alternative Investment Funds in Ireland (2015) 3; available at: https://irishfunds-secure.s3.amazonaws.com/1525962428-Irish-AIFs_web.pdf (date accessed: 3 January 2026).

Therefore, significant discrepancies exist in the data that explain the domicile distribution of the hedge fund industry. Trying to identify specific percentages of AIFs or AIFMs domiciled in a particular jurisdiction may be illusory because of the difficulty in accessing complete cross-jurisdictional data. However, it is clear that certain tax-efficient jurisdictions are key global competitors for hedge funds and their managers. According to IOSCO, these include the Cayman Islands, the US, Ireland, Luxembourg, and BVI. All other jurisdictions only account for an aggregate of 5 per cent of those surveyed.[56]

1.3.2 The structural influence of regulation

After reducing tax drag, a challenge for any hedge fund is to lighten the regulatory burden without damaging its reputation and to enable comprehensive and speedy distribution of the fund to key target markets. Several EU jurisdictions used their light regulatory regimes to compete for the EU hedge fund industry. Ireland, Luxembourg, Jersey, and Malta are the primary domiciles that have historically attracted the hedge fund industry.[57] However, AIFMD and Brexit have impacted the domiciles of choice for the EU hedge fund industry from a regulatory perspective.

Pre-AIFMD, all hedge funds were distributed through the national private placement regime of EU member states, as no passport existed for such unregulated funds. This meant that hedge funds and their management companies could be domiciled in any jurisdiction that offered tax and regulatory efficiency. A national private placement regime application would be made to distribute the hedge fund to investors in the EU target market. Therefore,

[56] IOSCO, *supra* note 18.
[57] Due to tax regime, the regulatory regime, the size of the banking industry, the fund accounting industry, the reputation of their stock exchanges, and the proximity to London, Ireland and Luxembourg have emerged as the two main domicile options for hedge funds and their management companies in the EU.

pre-AIFMD, there was no benefit to being domiciled onshore. The majority of hedge funds tended to be domiciled offshore in the Cayman Islands, and multiple national private placement registrations were made across the EU.[58]

AIFMD and its passport regime opened up the EU to distribution through a single authorisation process. Therefore, many offshore hedge funds and management companies redomiciled to Ireland and Luxembourg, where they could benefit from equally beneficial tax treatment and regulatory efficiency. The advantage of redomiciling onshore is speed to market and distribution through a single EU passport to access the entire EU as a target market.[59] Available data shows the increasing trend of Ireland and Luxembourg as a fund domicile for AIFs. These figures include property and private equity funds based in Germany and the UK, several times larger than the hedge fund industry. However, over 80 per cent of the surveyed data in Germany and the UK relates to 'other AIFs'. Looking through the data by AIF category, the hedge fund specific jurisdictions of choice are Ireland and Luxembourg.[60]

Pre-Brexit, the UK had three connections to the hedge fund industry. Firstly, the UK was a domicile of choice for 20 per cent of the EU hedge fund industry's AUM. Secondly, the majority of hedge fund investment managers were based in London. Thirdly, over 40 per cent of the funds invested in the EU hedge fund industry originated from the UK.[61] However, since the UK's withdrawal from the EU on 31 January 2020 and its participation in the Single

[58] D. Gabbert, *Hedge Funds* (London: LexisNexis, 2008) 7.
[59] As per 2021 ESMA data, the hedge fund industry is domiciled in only a few EU jurisdictions. However, ESMA reports data on AIFs and not just hedge funds. 29 per cent of the AIF industry is based in Germany, 20 per cent in the UK, 13 per cent in the Netherlands, 12 per cent in Luxembourg, 11 per cent in France, 7 per cent in Ireland, and the remaining 8 per cent distributed across the remaining EU Member States. See ESMA, *EU Alternative Investment Funds*, (2021) ESMA Annual Statistical Report 10; available at: https://www.esma.europa.eu/sites/default/files/library/esma50-165-1734_asr_aif_2021.pdf (date accessed: 3 January 2026).
[60] *Ibid*, 32.
[61] *Ibid*, 5.

Market from 31 December 2020, the UK has become a third country from an EU regulatory perspective. This means the UK is treated as an offshore location and is at a disadvantage to onshore funds and management companies authorised under AIFMD. Therefore, post-Brexit, there has been a migration from the UK to the EU of hedge funds and management companies.[62] However, investment managers have remained in the UK as a third-party service provider to the hedge fund. Brexit's impact has been to reweight the level of AUM domiciled in EU jurisdictions such as Ireland or Luxembourg. Greater regulatory oversight will result from this reweighting.

As a result of the tax and regulatory influences, the most popular models currently used within the EU hedge fund industry are for hedge funds and their management company to be domiciled in either Ireland or Luxembourg, the hedge fund manager to be domiciled in the UK or US, pre-trade service providers such as the prime broker to be domiciled in the UK, and post-trade service providers such as the administrator and depositary to be based in Ireland or Luxembourg. A hedge fund and its management company can be based in different jurisdictions as long as the management company has a passport to offer its management services in the jurisdiction where the fund is domiciled. Also, the administrator and depositary appointed to the hedge fund are generally domiciled in the same jurisdiction as the hedge fund.[63] This requirement is at the centre of the growth in the status of Ireland and Luxembourg as the servicing centres of choice to the EU hedge fund industry.

1.4. Ireland as an EU case study jurisdiction

[62] L. Fletcher, 'How Brexit and Covid-19 combined to hit UK hedge funds' Financial Times, 16 September 2020; available at: https://www.ft.com/content/1583f02f-2973-4597-942d-98a25c158a65 (date accessed: 3 January 2026).
[63] B. Prew, 'Depositary Compliance Under The Spotlight' (2014) 95 *The Hedge Fund Journal* 1.

The second element in explaining what a hedge fund is involves reviewing the key actors in a hedge fund structure. For this purpose, this part will use Ireland as a case study. Ireland and Luxembourg are the two leading EU domiciles of choice in relation to hedge funds, their management companies, and their service providers. In selecting one of these domiciles to use as a case study, this research takes into account the domicile of AIFs, AIFMs, administrators and depositaries, and the position of the local stock exchange as a listing domicile of choice for the funds, the size of the local financial sector, and the proximity and established relationship with the UK and US investment management industries.[64] Luxembourg has a higher level of hedge fund AUM than Ireland and has acknowledged expertise in distributing to target markets outside the EU. However, a greater number of management companies are domiciled in Ireland.[65] Also, Ireland has a higher level of AUM servicing. 60 per cent of EU hedge funds and 40 per cent of global hedge funds are administered from Ireland.[66] This is the reason why Ireland has such a strong connection to the ability of AIFMD's mandatory disclosure regime to ensure financial stability outcomes within the hedge fund industry. Both jurisdictions have a significant connection to the investment management industries in the UK and the US.[67] Each jurisdiction is equally qualified to be used as an EU case study, but this research will only use a single model.

The deciding factor in selecting a case study jurisdiction is the level of net new AUM domiciled in the jurisdiction since AIFMD and Brexit have occurred. This is a better gauge of

[64] See Irish Funds July 2021 Factsheet at; https://www.irishfunds.ie/stats/pdf/preview (date accessed: 3 January 2026).
[65] European Fund and Asset Management Association, 'Asset Management in Europe: An Overview of the Asset Management Industry' November 2020, 24; available at: https://www.efama.org/sites/default/files/publications/AssetManagement%20in%20Europe%2026%20NOV%202020.pdf (date accessed: 3 January 2026).
[66] Irish Funds Industry Statistics, May 2021, available at: https://www.irishfunds.ie/stats/pdf/preview (date accessed: 3 January 2026).
[67] J. McEnteggart, Why Ireland is Standing Ever Taller as a Funds Domicile of Choice, Institute of Directors in Ireland article of 5 May 2021; availavle at: https://www.iodireland.ie/resources-media/media-hub/blog/why-ireland-is-standing-ever-taller-as-a-funds-domicile-of-choice (date accessed: 3 January 2026).

the attractiveness of the jurisdiction under the current tax and regulatory regimes. In this respect, Ireland has attracted twice as much net new AUM as Luxembourg year on year, according to the Association of the Luxembourg Fund Industry (ALFI). The most recent survey data shows that Ireland has attracted net new AUM of €96.4bn, whilst Luxembourg has attracted €46bn.[68] Therefore, this part will use the Irish delegation model to explain the operational structure and service providers that are the foundation of the hedge fund industry.[69] The first section will review Ireland's position as a domicile of choice for hedge fund management companies. The second section will outline how hedge funds are structured. The third section will explain the role of the service providers to a hedge fund.

1.4.1. Ireland as an AIFM management company domicile of choice

A hedge fund can be internally managed by a board of directors or externally managed by a management company. A board of directors oversees a corporate structure, but a management company must be appointed if the hedge fund is in the form of a vehicle that does not have a separate legal personality.[70] However, the more popular format is for an Irish-domiciled hedge fund to be externally managed by an Irish management company or a Luxembourg management company with an AIFMD passport to Ireland.[71] Even where the hedge fund is

[68] ALFI European Investment Funds Statistics 2021; available at: https://www.alfi.lu/en-GB/Annual-Report/2020-2021/Statistics (date accessed: 3 January 2026).
[69] The Irish delegation model is where the hedge fund (AIFs), the management company (AIFMs), and post-trade service providers such as the administrator and depositary are based in Ireland. The hedge fund manager and the pre-trade service providers such as the prime broker are based in the UK. See European Fund and Asset Management Association, 'Asset Management in Europe: An Overview of the Asset Management Industry' November 2020, 24; available at: https://www.efama.org/sites/default/files/publications/AssetManagement%20in%20Europe%2026%20NOV%202020.pdf (date accessed: 3 January 2026).
[70] D. Gabbert and A. Wylie, *The Law of Hedge Funds: A Global Perspective* 2nd ed., (London: LexisNexis, 2018), 181-192.
[71] *Ibid*., 194.

structured as a variable capital company, a management company will often be used to centrally coordinate the service providers to the hedge fund.[72]

The Irish management company commonly outsources the discretionary investment decision process to an entity known as an investment manager.[73] These investment decisions include short-selling, leveraging and arbitrage or any other aspect of the investment strategy.[74] The investment manager also provides services associated with investment management, such as instructing the buying and selling of securities, performing portfolio monitoring, risk management and balancing, settlement and reconciliation of transactions, performance measurement and reporting, and regulatory reporting. As well as appointing the investment manager, the management company also appoints the Irish administrator or fund accountant and depositary.

1.4.2. Ireland as an AIF fund domicile of choice

Using the Irish delegation model as a framework, this section will first summarise the regulatory structure that an EU hedge fund falls under. Secondly, the section will outline the legal structures that an Irish-domiciled hedge fund may utilise to appeal to investor tax requirements. Thirdly, the section will review the fund structures that an Irish hedge fund may use to offer different currency or fee options to a globally diverse investor base.

1.4.2.1. Regulatory regimes

[72] *Ibid*., 195.
[73] *Ibid*., 196. This entity will make all the investment decisions for the hedge fund under pre-defined investment objectives and parameters set out in the fund's prospectus or the Investment Management Agreement signed between the hedge fund manager and the fund
[74] See 1.5.3.1.

Irrespective of where a fund is domiciled in the EU, it must be authorised under one of the two regulatory regimes that operate within the investment industry. The UCITS[75] and AIFMD[76] regimes cover all collective investment schemes domiciled in Ireland. Often, these regimes are seen as opposites, as UCITS are retail funds and AIFs are viewed as institutional funds. UCITS retail funds have many more investment restrictions placed upon them. AIFs are more unrestrained in what they can do in terms of their investing and risk-taking ability. Both regimes create an EU passport for the cross-border distribution of investment funds.[77] Hedge funds are regulated as AIFs. AIFs are simply defined as any fund not authorised as a UCITS fund.[78] There are many administrative and legislative differences between the two regimes.[79] Principally, AIFMD is a regime governing managers of AIFs.[80] It includes a passport for funds to be distributed to institutional or professional investors.[81] Its primary concern is financial stability and ensuring it through information disclosure.[82] Hedge funds authorised under AIFMD are categorised as qualifying investor alternative investment funds (QIAIFs), replacing the old qualifying investor fund (QIF) regime. Although all hedge funds

[75] Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), [2009] OJ L302/32. Also, Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions, [2014] OJ L257/186.
[76] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1.
[77] N. Moloney, *EU Securities and Financial Markets Regulation*, 4th ed. (Oxford: Oxford University Press, 2023), 231.
[78] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Art. 4(a)(ii).
[79] Moloney, *supra* note 41, 244, 294.
[80] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Art. 2(1)(a). In contrast the UCITS Directive regulates the UCITS fund itself, and not its management company.
[81] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Art. 4(1)(ag). In contrast the UCITS Directive allows funds to be primarily distributed to retail investors.
[82] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Art. 53 (1).

are QIAIFs, not all QIAIFs are hedge funds, since the QIAIF structure is used for any type of AIF, from property to private equity. A retail version of this structure also exists, known as a retail investor alternative investment fund (RIAIF).[83] Both the QIAIF and RIAIF can be legally structured in several ways, as outlined below.

1.4.2.2. Legal establishment options

Legal structures used to create a QIAIF or RIAIF are predominantly constituted in company law and trust law. These include variable capital companies, investment limited partnerships, and unit trusts.[84] A variable capital company is a structure where shares are issued to, or purchased from, investors to facilitate the subscription and redemption process. This is the most common and well-known hedge fund structure, whereby a separate legal personality is created, which is open-ended, meaning that the fund company can continuously issue new shares when investors subscribe. However, many jurisdictions do not allow companies to have variable capital structures, signifying that the structures can be more popular in some jurisdictions than others. However, there is a trend towards more jurisdictions creating a variable capital structure.[85]

Partnerships are also used to establish hedge funds. An investment limited partnership structure includes one or more general partners and one or more unlimited partners.[86] Limited partners are limited in liability to the extent of their initial contributions. However, general

[83] See Central Bank of Ireland at: https://www.centralbank.ie/regulation/industry-market-sectors/funds/aifs (date accessed: 3 January 2026).
[84] D. Gabbert and A. Wylie, *The Law of Hedge Funds: A Global Perspective* 2nd ed., (London: LexisNexis, 2018), 181-192.
[85] *Ibid*, 182.
[86] See T. Bullman, Investment Limited Partnerships (Amendment) Act 2020 annotation (2021) *Irish Current Law Statutes Annotated Review* 188. Section 5, Investment Limited Partnership Act, 1994.

partners have unlimited liability.[87] The main reason for a hedge fund to use a partnership structure is that they are treated as tax transparent under the laws of most jurisdictions.[88] This means that no tax is levied on the partnership. Tax is only levied on investors when the investors withdraw their funds from the partnership.[89]

A less frequently used structure is the unit trust.[90] In such a structure, an unincorporated trust issues units to investors who become trust beneficiaries. Trust law applies to this structure, which means a trustee must be appointed and the trustee assumes a fiduciary duty to protect the interests of the unitholders.[91] In a unit trust, units are issued to the beneficiary investor with rights similar to company shares or partnership interests. Also, similar to a partnership, a unit trust is tax-transparent.[92] The trust deed, which is the constituting document of the unit trust, can allow for this control structure to exist. However, in theory, it creates questions concerning the hedge fund manager and its fiduciary obligations to unitholders.[93] This uncertainty results in the unit trust structure being used less than the company or partnership structure. However, for global investors who seek this solution, this is a tax-efficient investment option.

There is also an unincorporated structure constituted under contract law called a Common Contractual Fund (CCF). The CCF is a tax-transparent unincorporated structure available to hedge funds, although infrequently used. This structure allows asset managers and owners to pool assets for tax efficiency purposes. Then each investor in the fund becomes a co-owner in the underlying investments in the fund. These structures are commonly favoured amongst

[87] Section 6, Investment Limited Partnership Act, 1994. Also, see M. Hudson, *Funds: Private Equity, Hedge and All Core Structures* (London: Wiley, 2014), 9-34.
[88] Gabbert and Wylie, *supra* note 48, 187.
[89] *Ibid*.
[90] Unit Trust Act, 1990.
[91] Gabbert and Wylie, *supra* note 48, 189.
[92] *Ibid*.
[93] *Ibid*., 190.

pension funds where profits of the CCF are treated as accruing to the investor as if they had not passed through a CCF structure. The tax saving percentage is minute, but it amounts to a considerable incentive to use the CCF structure because of the size of pension schemes.[94]

The most commonly used structures in Ireland by hedge funds are the variable capital company and partnership. This is largely due to tax factors.[95] A significant feature of using a company structure for Irish hedge funds is that a company is tax opaque in its own right. This means tax can apply at two levels. Firstly, tax is applicable at the company level, where profits are made. Secondly, tax applies at the investor level when dividends are paid. An onshore-domiciled company may therefore be subject to double taxation. Hence, many hedge funds that adopt the company structure are domiciled in tax-efficient jurisdictions like Ireland, where lower corporation tax rates are payable.[96] Most hedge funds are structured as open-ended investment companies to facilitate the process of subscriptions and redemptions into the fund.[97] This is because an open-ended company can continuously issue new shares as subscriptions are received from investors.

Another reason why Irish hedge funds use company structures is that many large institutional investors are restricted to investing in listed securities, which are under their investment mandate. A company structure can obtain a listing and therefore satisfy this investor requirement. The Irish Stock Exchange has become a global listing domicile of choice for quoted hedge funds for this reason. Hedge funds authorised and fulfilling the Central Bank of

[94] Part 2 of the Investment Funds, Companies and Miscellaneous Provisions Act, 2005. The Irish Finance Acts of 2003 and 2005 amended Irish tax rules applicable to collective investment schemes not established pursuant to company law or trust law. As a CCF is constituted under contract law a CCF is not chargeable to tax under amended Irish legislation. An example of the small saving is the reduced withholding tax rate in Ireland from 15% to 0% on Irish CCFs. This can amount to a significant saving if the pension fund invests hundreds of millions of euro.
[95] Gabbert and Wylie, *supra* note 48, 182.
[96] *Ibid*., 182. Also, see W. Moon, 'Regulating Offshore Finance' (2019) 72 *Vanderbilt Law Review* 1.
[97] *Ibid*., 183.

Ireland requirements fulfil many Irish Stock Exchange requirements as part of the regulatory authorisation process.[98] Hence, it is evident that Irish legal structures available to hedge funds are built around tax efficiency and fulfilling investor requirements. Therefore, these two factors have driven the growth of hedge funds domiciling in Ireland.

1.4.2.3. Fund structure options

It is most common for hedge funds to be set up in a master-feeder structure, where a series of feeder funds flow 100 per cent into a single master fund.[99] Every feeder fund has a single position in the master fund, and the master fund holds the security positions in the market. The purpose of creating a series of feeder funds is to be able to offer different feeder structures that appeal to different investor cohorts in terms of tax transparency, risk profile, fee structures or the necessity to invest in a listed company structure.[100] Therefore, a master-feeder structure is simply a way to market and facilitate subscriptions from the broadest possible variety of investors. This structure has become the favoured structure within the hedge fund industry.[101]

A similarly common fund structure used by hedge funds is the umbrella fund structure. An umbrella fund is a collective investment scheme that is divided into several distinct and separate sub-funds. The purpose of the sub-funds is to pursue different investment strategies, and each sub-fund benefits from segregation of liability from all other sub-funds. A sub-fund

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[98] *Ibid*., 184.
[99] European Central Bank, 'Manual on investment fund statistics' December 2017, 25, available at: https://www.ecb.europa.eu/pub/pdf/other/manualinvestmentfundstatistics201712.en.pdf (date acessed: 3 January 2026).
[100] Gabbert and Wylie, *supra* note 48, 191. Also, see M. Amorosi, G. Zornada, T. Gibson, J. Almquist and P. Man, 'Cross border master-feeder arrangements: SEC staff slightly expands utility of offshore feeders for global investment management firms, but tax and other challenges remain' (2017) 18 *The Journal of Investment Compliance* 16.
[101] *Ibid*., 192.

can only discharge liability out of its own assets. Any assets of a sub-fund sold and used to discharge the liability of another will have to be repaid or held in trust for the non-liable sub-fund. The purpose of the segregation rules is to protect investors by ensuring the ring-fencing of assets between each sub-fund in the case of insolvency. The Investment Limited Partnerships (Amendment) Act 2020 applied these umbrella fund rules to hedge funds established as investment limited partnerships.[102] The purpose of this amendment is to allow the Irish investment industry to offer all legal forms the same fund structuring options.[103] This is a double layer of structuring the hedge fund so that it has greater distribution potential and appeals to a global investor base with diverse requirements. By using master-feeder and umbrella fund structures, a hedge fund can meet investors' regulatory, legal, tax, and operational requirements without changing the underlying investment strategy. This flexibility allows funds to tailor access, fee structures, and risk-return profiles to different investors domiciled in any jurisdiction.

Finally, hedge funds can use the multi-class fund structure. This is a variation on the above umbrella fund structure. It allows for a fund or sub-fund to have different classes. These classes primarily exist to provide for different fee structures and currency denominations. Although a separate pool of assets exists within each sub-fund, there is no such division between classes of a fund. Generally, all the classes within a fund or sub-fund remain in a single pool of assets. Operating classes allows a fund to be valued and distributed in a local currency under a fee structure that is accepted locally.[104] However, offering so many different

[102] T. Bullman, Investment Limited Partnerships (Amendment) Act 2020 annotation (2021)) *Irish Current Law Statutes Annotated Review* 188.
[103] Section 41, Investment Limited Partnerships (Amendment) Act 2020.
[104] M. Brocard and F. Lhabitant, 'A Primer on the Tax Framework of Offshore and Onshore Hedge Funds' EDHEC Risk Institute Review Paper, June 2016, 19, available at: https://risk.edhec.edu/sites/risk/files/edhec-working-paper-a-primer-on-the-tax-framework-f_1467203960443.pdf (date accessed: 3 January 2026).

options to satisfy investor requirements can contribute to the complexity of market dealings, intensify interconnectedness, and reinforce the systemic position of the hedge fund industry.

1.4.3. Ireland as an AIF fund servicing centre of choice

Three key services are needed for a hedge fund to operate.[105] Although a single group may provide all of these functions, no single company within a group can provide more than one of these activities to a hedge fund because of the conflict of interest that would arise. Firstly, an investment manager is required to make and oversee investment decisions to ensure that the investment mandate is adhered to. As mentioned above, an investment manager is the entity responsible for executing and balancing the risk profile of the hedge fund, and it makes the decisions about short-selling and leveraging. However, this service is usually provided in the UK or the US, where most fund managers and prime brokers are domiciled.[106]

Secondly, the fund administrator is the entity delegated with the responsibility to carry out all fund accounting responsibilities for the fund. This includes calculating the net asset valuation (NAV) of the fund or NAV strike price, preparing and submitting all annual and semi-annual financial statements for the fund to shareholders and the regulator, maintaining all books and records of the fund, monitoring investment compliance, monitoring the provision of transfer agency services and maintenance of the shareholder/unitholder register for the fund.[107] As the keeper of all books and records, the administrator is the primary entity that provides information to fulfil mandatory disclosure to regulators.

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[105] Gabbert and Wylie, *supra* note 48, 193.
[106] Financial Stability Board, 'The Financial Stability Implications of Leverage in Non-Bank Financial Intermediation' 6 September 2023; available at: https://www.fsb.org/uploads/P060923-2.pdf? (date accessed: 3 January 2026).
[107] Gabbert and Wylie, *supra* note 48, 198-202.

Thirdly, assets of a hedge fund are protected by a depositary or custodian. A custodian is a financial institution responsible for such functions as the safeguarding of fund assets, settlement of purchases and sales of fund securities, collection of income from fund assets, maintenance of fund bank accounts, and provision of foreign exchange for international transactions.[108] A depositary is very similar in that it can perform custodial functions for the fund and ensure regulatory compliance. However, there are some very noticeable differences between a custodian and a depositary. A depositary can execute an investment decision, whereas a custodian is not enabled to do so. Depositaries are also enabled to have more control over client assets. For these reasons, depositaries generally have a higher level of liability than a custodian.[109] The decision for a management company to appoint a depositary or a custodian typically comes down to the strategy being followed. In the hedge fund industry, it is much more common for a depositary to be appointed to perform all of the necessary custodial functions or to delegate to a sub-custodian, such as a prime broker. Therefore, a depositary should be considered a super-custodian or central-custodian that performs, delegates, or coordinates the execution of the custodial function.

For a hedge fund, one type of sub-custodian that can be appointed is a prime broker.[110] The prime broker is allowed access to the fund's positions to do such things as manage margin requirements for the fund's trading.[111] Prime brokerage is the generic term used for a bundled package of services offered by investment banks and securities firms to hedge funds and other professional investors needing the ability to borrow securities and cash to invest on a net basis and achieve an absolute return. It is through a prime broker that a hedge fund can

[108] D. Chan, F. Fontan, S. Rosati and D. Russo, 'The Securities Custody Industry' ECB Occasional Paper No. 68, August 2007, 6; available at: https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp68.pdf (date accessed: 3 January 2026).
[109] FCA, 'Depositaries' 28 January 2019; available at: https://www.fca.org.uk/firms/aifmd/depositaries (date accessed: 3 January 2026).
[110] Gabbert and Wylie, *supra* note 48, 203.
[111] *Ibid*., 204-205.

short-sell and leverage.[112] The prime broker provides a centralised securities clearing facility for the hedge fund. The hedge fund's collateral requirements are consequently netted across all deals handled by the same prime broker.[113] Hence, the depositary and prime broker have a central role in facilitating the investment manager's ability to execute a strategy for the hedge fund based on short-selling and leveraging. However, although the administrator and depositary of an AIF must be domiciled in the same jurisdiction as the AIF, the prime broker will often be domiciled in the same jurisdiction as the investment manager.[114]

1.5. Unique investment characteristics of a hedge fund

In order to assess the activities of a hedge fund, it is essential to understand what makes a hedge fund unique in terms of its investment characteristics. Many different fund types exist within the investment industry, including hedge funds, UCITS funds, private equity funds and property funds. This part will compare hedge funds to UCITS funds and private equity funds to demonstrate their unique characteristics. The purpose of selecting these comparators is that UCITS funds are seen as the retail opposite of an institutional alternative investment fund. Within the alternative investment fund sphere, hedge funds are viewed as the opposite of private equity funds.[115] The first section will differentiate hedge funds from other fund types within the fund industry. The second section will outline the unique profit objective and fee structure of hedge funds. The third section will explain the investment practices that a hedge fund engages in and how these investment practices are coupled to form a hedge fund investment strategy.

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[112] *Ibid*.
[113] C. McNamara and A. Metrick, 'Basel III E: Synthetic Financing by Prime Brokers' (2019) 1 *Journal of Financial Crisis* 91. Also, see Gabbert and Wylie, *supra* note 48, 76.
[114] It is due to this requirement that Ireland has built its servicing centre capability and size.
[115] D. Busch, 'Sustainable investment management in the European Union' (2025) 20(4) *Capital Markets Law Journal* 1.

1.5.1. Hedge funds as an identifiable sub-category of Alternative Investment Funds

This section aims to demonstrate that the EU fund industry is divided into two halves and to differentiate hedge funds therein. The Undertakings for Collective Investment in Transferable Securities (UCITS)[116] regime is concerned with the restrictive management of retail distributed funds. The Alternative Investment Fund Managers Directive (AIFMD)[117] regime is concerned with the unrestrained management of institutional or professional-oriented funds. However, within the alternative investment sector, hedge funds are a sub-category. This section therefore, outlines the difference between the hedge fund sector and its two comparator sectors.

1.5.1.1. UCITS retail funds

Pre-AIFMD, the EU investment fund industry was broken into two categories of funds. These included the regulated UCITS product and all other non-regulated investment products, referred to collectively as non-UCITS funds.[118] UCITS funds were created for distribution to retail investors who needed investor protection to be at the core of the product design. Non-UCITS funds were conversely created for distribution to institutional or professional

[116] Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), [2009] OJ L302/32.
[117] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1.
[118] Moloney, *supra* note 41, 200.

investors who understand the risk/return balance. Since the implementation of AIFMD, the non-UCITS category has now become known as the AIFMD regime.

Collective investments were originally regarded as a means of nurturing private investment capital in faltering European markets. Building on the concept of a European marketplace and the importance of institutional investors in aggregating capital within markets, it was viewed as a mechanism that needed further investigation. In 1966, the Segré Report addressed the development of the capital markets in Europe.[119] In this report, a shortage of private investor capital in the market was identified. The report emphasised the need for market expansion, noting that:

> 'the financing of economic growth is coming to depend more and more on the capital market, and the establishment of wider markets and close co-ordination of economic policies would facilitate this growth … increasing the supply of capital as financial savings are attracted to the market by the wider range of investment outlets.'[120]

Hence, regulatory change and industry innovation, as supported by government policy, were indicated as necessary to strengthen the market. Institutional investors were also identified by the Report as the most appropriately placed to manage the savings of the public who had little experience in this area. Collective investment was proposed as a solution to this dilemma.[121] By the mid-1970s, collective investment schemes were in operation in several European countries but only formally regulated in France. The other Member States were using company law to regulate the collective investment schemes, which at that time were only using the corporate structure. For this reason, the Commission made its first proposal in 1976

[119] Report by a Group of Experts Appointed by the EEC Commission, The Development of a European Capital Market (1966); available at: https://koflerge.org/wp-content/uploads/2019/01/segre.pdf (date accessed: 3 January 2026).
[120] *Ibid*., 15.
[121] Moloney, *supra* note 41, 204.

to harmonise the regulation of the collective investment industry across the Member States.[122] The proposal gained widespread support but did not materialise into a structured passport regime until the 1985 Internal Market White Paper was published.[123] Subsequently, collective asset management was first regulated through the Undertakings for Collective Investment in Transferable Securities (UCITS) Directive and its successive iterations.[124]

UCITS funds are designed for distribution to the general public, often referred to as retail funds. In its own right, the UCITS regime is significant as a regulatory model, a Prometheus of its kind in enabling passporting and establishing rules on fund liquidity, disclosure, investment restrictions, and risk taking. This passporting regime has also been accepted in non-EU markets as representing a high standard of regulatory protection to retail investors. A significant feature of the UCITS regime is therefore the passport it created to enable distribution across the EU and further abroad.[125] The UCITS regime essentially acts as a mechanism for investor protection through the application of standard risk mitigation rules. These include measures to ensure fund liquidity to support retail investor redemptions,

[122] *Ibid*, 205.
[123] Commission of the European Comminuties, 'Completing the Internal Market' COM (85) 310; available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:51985DC0310 (date accessed: 3 January 2026).
[124] Directive 85/611/EEC of the European Parliament and of the Council of 20 December 1985 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), [1985] OJ L375/3. This Directive has seince been rpealed and replaced by a series of reforms. The most notable is Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) [2009] OJ L302/32. Also, the most updated reform is Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions [2014] OJ L257/186.
[125] Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), [2009] OJ L302/32. Also, Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions, [2014] OJ L257/186.

diversification rules to prevent loss, investment restrictions around the use of derivatives and leverage, and full disclosure on fund positions and strategies.[126]

Funds, such as hedge funds that do not meet the requirements of the UCITS Directive and follow more risky strategies, must be authorised as AIFs. Such funds engage in the use of derivatives, leveraging and short selling. These funds often maintain illiquid portfolios, as institutional investors do not trade in and out of the fund frequently. Previously, such funds were not authorised funds and therefore could not benefit from an EU distribution passport. Instead, they were distributed through Member State private placement regimes.[127] As these funds were only available to institutional or sophisticated investors, regulatory concern revolved around the financial stability threats linked to unrestrained non-UCITS funds rather than investor protection.[128] However, such funds are now regulated under AIFMD and benefit from its passport.

The differences between UCITS and non-UCITS, now called AIFs, are not insignificant. They are at opposite ends of the investment spectrum. The UCITS regime is characterised by asset allocation rules concerning the maximum concentration of the portfolio, risk spreading rules concerning the minimum number of positions to be held in a portfolio, and investment limits to control portfolio exposures through such instruments as derivatives under the UCITS.[129] Non-UCITS funds, now authorised as AIFs under AIFMD, are not bound by any of these rules. The rationale for the differentiation is that UCITS funds are for retail distribution, whereas AIFs are for institutional or professional investor distribution.

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[126] Moloney, *supra* note 41, 202.
[127] See N. Tuchschmid, E. Wallerstein, and L. Zanolin, 'Will Alternative Ucits Ever be Loved Enough to Replace Hedge Funds?' (2010); available at: http://ssrn.com/abstract=1686055 (date accessed: 3 January 2026).
[128] Moloney, *supra* note note 41, 209.
[129] *Ibid*., 224-238.

1.5.1.2. Private equity funds

Hedge funds and private equity funds have historically been considered the two major institutional or professional investor options within the alternative investment industry.[130] These two fund types have many similarities, such as their focus on leverage, their risk appetite, and institutional or professional investor orientation. However, there are many further differences between these investment types, a reason why certain commentators have highly criticised regulating both investment types under the same rules.[131]

Within the non-UCITS – now AIFMD – sphere, it is difficult to assess which fund type is the dominant sub-sector. According to ESMA statistics, over 60 per cent of AIFs choose not to self-identify.[132] The four major AIF types are property or real estate funds, private equity funds, hedge funds and fund of funds.[133] A fund of funds vehicle is simply a fund made up of a selection of the first three types of funds. Property or real estate funds invest in and manage physical commercial property such as hotels and shopping centres. Therefore, these funds are not as effective examples for comparison to a hedge fund.

A notable distinguishing feature of private equity funds relative to hedge funds is that private equity funds principally seek to acquire control of private companies.[134] Private equity funds strive to gain control by sourcing institutional investors who are willing to commit large

[130] J. Khort, 'Protection of Private Equity Fund Investors in the EU' (2015) 12(2) *European Company Law* 97.
[131] E. Ferran, 'The Regulation of Hedge Funds and Private Equity: A Case Study in the Development of the EU's Regulatory Response to the Financial Crisis' University of Cambridge Faculty of Law Research Paper No. 10/2011, available at: http://ssrn.com/abstract=1762119 (date accessed: 3 January 2026).
[132] European Securities and Markets Authority, *ESMA Annual Statistical Report: EU Alternative Investment Funds 2020* (2020), 147; available at: https://www.esma.europa.eu/sites/default/files/library/esma50-165-1006_asr-aif_2020.pdf (date accessed: 3 January 2026).
[133] *Ibid*.
[134] J. McCahery and E. Vermeulen, 'Private Equity Regulation: A Comparative Analysis' (2012) 16 *Journal of Management and Governance* 197.

investment capital that is drawn down by the private equity fund over time as it is needed. Once committed funds are fully invested, the fund becomes closed until the strategy is completed and the portfolio is liquidated. This can take five to ten years, but the offering documentation will specify the life of the investment. Once closed, no subscriptions or redemptions are permitted until the fund is liquidated. The private equity firm may take seats on the board of directors of the target private companies to help to restructure and grow them.[135]

On the contrary, a hedge fund does not seek to control private companies in the same way. More often, hedge funds invest and seek to control publicly quoted companies as an activist shareholder.[136] Hedge funds also focus on seeking out arbitrage opportunities and distressed undervalued securities rather than growing businesses the way a private equity fund would.[137] An investor can subscribe and redeem out of a hedge fund at will, and the fund does not have a liquidation date. Although a private equity fund engages in financial leverage through mezzanine debt, most commonly used in leveraged buyouts, a hedge fund obtains its financing through synthetic leverage in the repo market.[138]

Hedge funds and private equity may have similar target investors and risk profiles.[139] However, they are complete contrasts in terms of investment horizon, type of leverage used, and the ability to enter and exit the fund at will. For this reason, any recommendations around leveraging and systemic risk mitigation will be specific to hedge funds and not the AIF

[135] D. Stowell, *Investment Banks, Hedge Funds, and Private Equity*, 3rd ed. (London: Academic Press, 2018) 339-343.
[136] A. Brav, W. Jiang, S. Ma, and X Tian, 'How does hedge fund activism reshape corporate innovation?' (2018) 130 *Journal of Financial Economics* 237.
[137] D. Brutti, 'Soverign Debt Crises and Vulture Hedge Funds: Issues and Policy Solutions' (2020) 61 *Boston College Law Review* 1819.
[138] G. Brown, R. Harris, and S. Munday, 'Capital Structure and Leverage in Private Equity Buyouts' (2021) 33(3) *Journal of Applied Corporate Finance* 42.
[139] C. Bienz, K. Thorburn, and U. Walz, 'Fund Ownership, Wealth, and Risk-Taking: Evidence on Private Equity Managers' (2023) 54 *Journal of Financial Intermediation* 1.

sector, even though the single set of applicable rules is found in AIFMD. As discussed in the next section, another difference between hedge funds and UCITS or private equity funds is the investment objective and associated fee structure.

1.5.2. Identification through its unique return objective or fee structure

After the 2008 financial crisis, and to give effect to the G20 policy on regulating hedge funds, the IOSCO Technical Committee established the Task Force on Unregulated Financial Entities to make recommendations on the regulation of the hedge fund industry.[140] IOSCO produced a seminal set of recommendations that provided a principles-based definition for hedge funds.[141] However, part of the difficulty in identifying a hedge fund under the IOSCO assumptions is that a UCITS fund can engage in several of these same activities.[142] Therefore, it is important to understand the unique elements that relate to hedge funds exclusively. Thus, the first sub-section will give an overview of the absolute return objective of a hedge fund. This is the driving force behind the proclivities and investment practices of a hedge fund. The second sub-section will explain the fee structure of a hedge fund. This complicated structure has built-in risk incentives for hedge fund managers. These incentives must be understood in order to comprehend the incentives for trading, which can result in systemic risk.

1.5.2.1. Absolute return objective

[140] Technical Committee of the International Organization of Securities Commissions, 'Hedge Fund Oversight Final Report' (2009) PD293; available at: http://www.iosco.org/library/pubdocs/pdf/IOSCOPD293.pdf (date accessed: 3 January 2026).
[141] *Ibid*., 4. Those principles included borrowing and leverage restrictions, performance fees, periodic redemption rather than daily, 'own' funds are invested by the manager of the hedge fund into the hedge fund, derivative products are used, short selling is permissible, and complex products are used to manage risk within the fund and make a speculative return.
[142] Periodic redemption, investing own funds, the ability to use derivatives or short-sell are not unique to hedge funds.

The absolute return objective is a simple one that uniquely underpins hedge fund activity. Absolute return is the concept of asymmetric returns as markets go through the cycle of increasing and decreasing. Absolute return means that the hedge fund ignores measuring itself against a benchmark and seeks to profit under any market conditions.[143] This means that hedge funds do not correlate to the market in such a way that they are profitable in upswings and loss-making in downturns. Hedge fund managers achieve this absolute return objective on behalf of the hedge fund by executing more equity-like strategies as markets increase, and more bond-like strategies as markets fall.[144] In essence, hedge fund managers combine the process of short-selling and leverage to express negative market sentiment and profit as markets decline. To profit as markets rise, managers combine leverage with buying long to express positive market sentiment.[145]

Management fees, incentive or performance fees, asset size, lock-up periods, fund age and the amount of leverage used, can all significantly impact the ability of a hedge fund to generate an absolute return in all market conditions.[146] However, the most significant determinant in achieving an absolute return is how these features are combined to execute an investment strategy. From the perspective of a hedge fund, an unrestrained form of asset management that can access powerful leverage finance is essential to achieving an absolute return under all market conditions.

1.5.2.2. Fee structure

[143] M. Falkowski, A. Sierpińska-Sawicz and P Szczepankowski, 'The Effectiveness of Hedge Fund Investment Strategies under Various Market Conditions' (2020) 14 *Contemporary Economics* 127.
[144] D. Tudot and B. Cao, 'The Absolute Returns of Hedge Funds' (2012) 38 *Managerial Finance* 281.
[145] See 1.5.3.1. for further discussion.
[146] Tudot and Cao, *supra* note 108, 285.

A unique characteristic of hedge funds is the fee structure operated by the hedge fund manager, known in the industry as '2 and 20'.[147] A hedge fund manager takes 2 per cent of the assets under management at the end of the month as a management fee. However, above a high-water mark, 20 per cent of all profits is also taken as an incentive fee. The high-water mark is the highest performance point of the hedge fund.[148] This is a significant share of the profits for a hedge fund manager to keep, but it has become industry standard.[149]

The implications of the fee structure are profound. In particular, the data contained in Guasoni and Obloj's empirical study of the Lipper-TASS hedge fund database confirms the importance of fee structure.[150] Firstly, the high-water mark of performance impacts an individual fund's profile as it influences risk-taking.[151] By establishing the level at which performance fees resume, it creates incentives that can materially alter the hedge fund manager's attitude toward risk. Secondly, hedge funds that charged higher performance fees also tended to have higher levels of leverage.[152] Thirdly, performance fees directly link leverage and performance, which accordingly determines the delivery of fees to the hedge fund manager.[153] Hence, along with the absolute return objective, the fee structure of a hedge fund is intimately connected to the hedge fund's ability to be managed in an unrestrained and leveraged manner. The lack of restraint on these practices can amplify systemic threats. The potential for increased systemic risk justifies regulatory attention towards such an unrestrained hedge fund.

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[147] M. Escobar-Anel, Y. Havrylenko, and R. Zagst, 'Optimal Fees in Hedge Funds with First-Loss Compensation' (2020) 118 *Journal of Banking* 1.
[148] A high-water mark is the highest value that an investment fund has achieved. A fund manager only receives a performance fee on that amount which exceeds the high-water mark.
[149] P. Guasoni and J. Obloj, 'The Incentives of Hedge Fund Fees and High-Water Marks' (2016) 26 *Mathematical Finance* 269.
[150] *Ibid.*
[151] *Ibid*., 270. Also, see H. Baker, I. Chkir, S. Saadi and L. Zhong, 'What Drives the High Moments of Hedge Fund Returns?' (2017) 49 *Applied Economics* 738.
[152] Guasoni and Obloj, *supra* note 113, 280.
[153] *Ibid*., 285.

1.5.3. Hedge fund investment practices and strategies

The objective of this section is to explain the investment practices and strategies of a hedge fund. For the purposes of this thesis, an 'investment practice' is a hedge fund manager capability. An 'investment strategy' is when a hedge fund manager combines several investment practices into a structured plan to achieve an absolute return. Hedge fund investment strategies are also highly technology-assisted in how they are executed. Direct market access, algorithmic trading, and high-frequency trading have allowed hedge funds to execute increasingly complex investment strategies.[154]

In achieving its objective, this section will be divided into three sub-sections. Firstly, it will explain the common investment practices used by hedge funds, and this includes short-selling and the use of leverage. Secondly, it will explain the manner in which these investment practices are combined and executed as a strategy. This includes explaining the difference between the most common hedge fund investment strategies: global macro, multi-strategy, and equity long/short. Thirdly, the use of digital solutions in the execution of these strategies will be discussed. This includes the practices of Direct Market Access (DMA) and the High-Frequency Trading (HFT) sub-category of algorithmic trading.

1.5.3.1. Hedge fund investment practices

[154] G. Gregoriou and J. Moschella, 'The Efficiency and Productivity of Hedge Fund Families' (2017) 20 *The Journal of Wealth Management* 101.

This sub-section will outline the two defining investment practices of a hedge fund: firstly, short-selling to benefit from falling prices in securities markets; and, secondly, the use of leverage to magnify portfolio position performance.[155]

1.5.3.1.1. Short-selling

Short-selling is a widely used hedge fund strategy that enables the hedge fund to profit from the decline in the price of a security instrument. It is an investment practice used in both the equity and fixed-income markets.[156] To make a profit, a short-seller (hedge fund manager) identifies stocks that it believes are overpriced in the market and are due a market correction downwards. A company that sells outdated technology or a bank that has fallen out of favour with its depositors is an example of such a scenario. The short-seller simply pays a fee to borrow these securities from a prime broker and simultaneously sells them at the prevailing market price. Then, when the market price of the stock falls, the short-seller repurchases the securities in the open market at a lower price and returns them to the prime broker they were borrowed from.[157] The difference between the initial price the securities were sold short at and the lower price they were repurchased at represents the short-seller's profit. However, short selling can be costly when security prices rise above the initial price at which the securities are short-sold.[158]

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[155] Preqin, *Investor Update: Alternative Assets H2 2020*, 19 August 2020. Institutional investors with exposure to hedge fund vehicles were surveyed to assess their allocation adjustments into hedge funds during the COVID-19 pandemic. 44 per cent indicated an intention to increase their allocation to hedge funds in the coming year, double the allocation of 2019. European Securities and Markets Authority, *ESMA Annual Statistical Report: EU Alternative Investment Funds 2020* (2020), 10; available at: https://www.esma.europa.eu/sites/default/files/library/esma50-165-1006_asr-aif_2020.pdf (date accessed: 3 January 2026).

[156] G. Hunanyan, *The Consequences of Short-Sale Constraints on the Stability of Financial Markets* (New York, Springer: 2019), 33-42.

[157] R. Veil, *European Capital Markets Law* (2nd edition) (London, Bloomsbury: 2017), 466-470.

[158] P. Saffi and K. Sigurdsson, 'Price Efficiency and Short Selling' (2011) 24 *Review of Finance Studies* 821.

Short selling originated as a covered practice in equity markets. This meant that to short an equity stock, an agreement had to be in place whereby the same amount of the equity stock could be obtained to close the position if the price moved unfavourably. This ensured that, if prices increased rather than decreased, the short position could be closed and losses capped.[159] However, the practice of short-selling on its own represented a speculative practice, a bet that a share's price was overvalued and likely to fall.[160] A riskier version of this strategy is known as uncovered or naked short-selling.[161] In this scenario, the underlying shares that are sold short are not available to the short-seller at the point in time when the short position is opened. This effectively opened up the short-seller to an unlimited loss if prices increase rather than decrease because the shares are unavailable to close out the position.[162] Naked shorting was a speculative way to express negative sentiment on price without having access to the underlying shares. However, this naked short-selling practice has been banned in the US, UK and the EU because of the market manipulation that it can promote.[163] Also, it is now mandatory for all short-selling to be disclosed.[164]

Further analysis of short-selling is beyond the focus of this thesis, as regulatory measures have already been put in place to combat short-selling. These measures involved the

[159] J. Christian, R. Shapiro and JP. Whalen, 'Naked Short Selling: How Exposed Are Investors' (2006) 43 *Houston Law Review* 1033, 1041.
[160] *Ibid*., 1042.
[161] E. Howell, 'The Regulation of Short Sales: A Politicised Topic' (2018) 12 *Law and Financial Markets Review* 203.
[162] Christian *et al*, *supra* note 123, 1044.
[163] E. Howell, 'Short Selling Restrictions in the EU and the US: A Comparative Analysis' (2016) 16(2) *Journal of Corporate Law Studies* 333.
[164] For a discussion of the historical debate and updated methods of restricting this practice see K. McGavin, 'Short Selling in a Financial Crisis: The Regulation of Short Selling in the United Kingdom and the United States' (2010) 30 *Northwestern Journal of International Law & Business* 201, 209-224. Also, see P. Staikouras, 'EU Short Selling Regulation Revisited: New Evidence, Different Perspective' (2015) 26 *European Business Law Review* 531.

implementation of real-time reporting of equity market trading and an associated circuit breaker when security prices experience sharp intra-day declines.[165]

1.5.3.1.2. Leverage

Short-selling often exploits small price decreases. Therefore, the way to make such movements more profitable is for hedge fund managers to leverage the short position. Leverage acts as a magnifier of the profit of a portfolio position. However, adding leverage to the short-selling practice doubles the risk of loss if the market moves against a portfolio position. Leverage has therefore become a mechanism by which short-selling has become speculative.[166]

Hedge funds utilise two forms of leverage: financial leverage in the form of cash borrowing and synthetic leverage in the form of derivatives and repos.[167] In essence, financial leverage is the borrowing of cash through a traditional banking finance model, which appears on the balance sheet of the hedge fund. Rather than going to banks for this leverage, hedge fund managers are increasingly seeking short-term secured and unsecured balance sheet lending through prime brokers in the repo market.[168] This is achieved by collateralising portfolio positions and posting them as security for credit, with an associated repurchase agreement (repo) for the collateralised securities.[169] Less collateral is needed to be posted for a repo than

[165] On short-selling regulation, see further Howell, *supra* note 125, and I. Sifat and A. Mohamad, 'Circuit Breakers as Market Stability Levers: A Survey of Research, Praxis, and Challenges' (2019) 24 *International Journal of Finance and Economics* 1130.
[166] A. Simsek, 'The Macroeconomics of Financial Speculation' (2021) 13 *Annual Review of Economics* 335.
[167] ESRB, Containing risks posed by leverage in alternative investment funds: Occasional Paper Series No 28 (December 2025); available at: https://www.esrb.europa.eu/pub/pdf/occasional/esrb.op28~496399501a.en.pdf (date accessed: 3 January 2026). A. Johnston, 'Regulating Hedge Funds for Systemic Stability: The EU's Approach' (2015) 21 *European Law Journal* 762. Also, see 2.2 for a discussion on how hedge funds access leverage.
[168] S. Williamson and L. Masters, 'Prime Brokers and Hedge Funds' (2008) 36 *The Hedge Fund Journal* 1.
[169] *Ibid*. Also, see J. Daníelsson, A. Taylor and J.-P. Zigrand, 'Highwaymen Or Heroes: Should Hedge Funds Be Regulated? A Survey' (2005) 1 *Journal of Financial Stability* 522.

is the case for an equivalent cash market position.[170] This is also true in using other derivatives, such as forward contracts, exchange-traded futures, or options to acquire synthetic leverage.[171]

The advantage of having off-balance-sheet finance for a hedge fund is that it reduces the cost of capital, increases the rate of return, and makes it appear as if the fund is performing better than it is for the risk it carries. However, a core practice of hedge funds is that they tend to commit less of their capital.[172] Synthetic leverage does not appear on a hedge fund's balance sheet and can be embedded in a derivative position.[173] This type of leverage allows a hedge fund to make a profit or loss considerably larger than the initial investment into the portfolio position. Because leverage can be off-balance sheet, it is also more opaque.

There are two factors which make it challenging to deal with hedge fund leverage levels. Firstly, there is an issue concerning the data available to timely measure leverage. Secondly, there is no methodological consistency in how this leverage is calculated, even if sufficient data were available. This is at the core of the challenge of how to regulate leverage.[174]

As trading within financial markets has become more globalised, an arbitrage opportunity has emerged. Markets can be accessed from around the globe through developments in modern financial technology. Modern technology can identify potential pricing differences when interest rate and exchange rate differences are considered in a trade. Hedge funds

[170] P. Breur, 'Measuring Off-BalanceSheet Leverage' (2000) *IMF Working Paper* WP/00/202, 5-8; available at: https://www.imf.org/external/pubs/ft/wp/2000/wp00202.pdf (date accessed: 3 January 2026).
[171] *Ibid., 9*.
[172] *Ibid.*
[173] Johnston, *supra* note 131, 763.
[174] D. Awrey, 'The Limits of EU Hedge Fund Regulation' (2011) 5 *Law and Financial Markets Review* 119, 125 fn 11.

opportunistically seek lower transaction costs and pricing differences.[175] As applied to hedge funds, arbitrage simply exploits the differences in security prices in different markets due to the impact of interest rate and foreign exchange rate movements. The power of a hedge fund manager and the success of a hedge fund are evidenced in how these investment practices and technology are combined into an investment strategy.

1.5.3.2. Hedge fund investment strategies

For the purposes of this section, an investment strategy is a way in which investment practices are combined to achieve a pre-determined investment objective or absolute return. According to research by IOSCO, the investment strategy of a hedge fund is its most powerful identifier.[176] Although there is no definitive list of possible strategies that can be followed, IOSCO has outlined the most common strategies based on 2020 survey data.[177] 55 per cent of global assets under management (AUM) within the hedge fund industry pursued a multi-strategy, equity long/short, or a global macro strategy.[178] IOSCO outlines seven hedge fund investment strategies in total and then creates a separate category called 'Other Strategies.'[179] The remaining 45 per cent is split between these strategy categories.[180] To demonstrate how hedge fund practices are combined into strategies, this sub-section will use the top three strategies as an example.

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[175] H. Nabilou, 'Regulatory Arbitrage and Hedge Fund Regulation: The Need for a Transnational Response' (2017) 22 *Fordham Journal of Corporate & Financial Law* 559.
[176] IOSCO, Report on the Fifth IOSCO Hedge Funds Survey : Final Report, April 2020, 7, available at: https://www.iosco.org/library/pubdocs/pdf/IOSCOPD653.pdf (date accessed: 3 January 2026).
[177] *Ibid*., 8.
[178] *Ibid*.
[179] *Ibid*.
[180] *Ibid*. For a list of the 15 acknowledged strategies followed by European hedge funds see S. Khelifa, 'European hedge funds: share restrictions, incentives and performance' (2018) 12 *Law and Financial Markets Review* 145.

A multi-strategy approach can involve a combination of techniques. Each discernible strategy used by the hedge fund works together as part of an overall risk-adjusted profit-maximisation approach. Within a multi-strategy approach, the most common integrated elements are strategies designed to exploit arbitrage opportunities. These include convertible bond arbitrage, statistical arbitrage, and merger arbitrage strategies.[181] These arbitrage strategies exploit small differences in prices between bonds and underlying equity, between paired equity, and the equity of merging companies, respectively. However, the difference in pricing is so small that the trade must be significantly leveraged to generate a profit. An equity long/short strategy combines long equity positions in undervalued stocks with short-selling of overvalued stocks.[182] Such a strategy is heavily based on short-selling and often combined with leveraging to magnify returns. A global macro strategy takes signals from economic indicators and their perceived impact upon financial markets.[183] Such sentiment can be negative and therefore expressed in short-selling.

In summation, certain strategies are equity-based, while other strategies are fixed-income-based. Many strategies are focused on arbitrage and are therefore dependent on leveraging to profit from minute price differences. Different strategies are focused on a negative sentiment that the security is overpriced, and therefore must be short-sold to generate profit when price correction occurs. In all cases, the strategy and resulting risk to financial markets are based on unrestrained speculative short-selling, leveraging, and arbitrage exploitation.[184]

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[181] S. Subhash and D. Enke, 'Hedge Fund Replication Using Strategy Specific Factors' (2019) 5 *Financial Innovation* 8.
[182] IOSCO, *supra* note 140, 5-6.
[183] *Ibid*., 7.
[184] F. Hespeler and G. Loiacono, 'Monitoring Systemic Risk in the Hedge Fund Sector' (2017) 17 *Quantitative Finance* 1859-1867. Heseler and Loiacono have analysed pre-and post-2008 crisis data across all hedge fund strategies to determine if all strategies represented the same risk, if the crisis had an impact on that risk, and, the extent to which that risk was cross-sectoral. These results are also mirrored in M. Falkowski, A. Sierpińska-Sawicz and P. Szczepankowski, 'The Effectiveness of Hedge Fund Investment

1.5.3.3. The use of digital execution solutions by hedge funds

Technological advancements have impacted the development of the hedge fund industry and how it executes its investment strategies. At an operational level, technological developments have enabled many efficiencies in the transfer of information. This efficiency in information transfer includes regulatory reporting and compliance, trade reconciliation, and calculating the fund's net asset value (NAV). Technological advancements have also acted as a catalyst for the evolution of hedge fund strategies by automating the process of finding opportunities and executing trades.[185] Therefore, technology represents part of how hedge fund practices and investment strategies have become a systemic threat within financial markets.[186]

Many changes have occurred within the hedge fund industry due to technological disruption. Two of these changes include Direct Market Access (DMA) and algorithmic trading.[187] The former advancement is concerned with execution speed. The latter is concerned with the identification and profit maximisation of strategic opportunities. Therefore, it is common for both techniques to be used together.

DMA is the ability to access a stock exchange's order book directly. This has two benefits. Firstly, it allows the party with direct market access the ability to see the order book. This

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Strategies under Various Market Conditions' (2020) 14 *Contemporary Economics* 127. See also, H. Nabilou, 'Regulatory Arbitrage and Hedge Fund Regulation: The Need for a Transnational Response' (2017) 22 *Fordham Journal of Corporate & Financial Law* 570.

[185] W. Currie and J. Seddon, 'The Regulatory, Technology and Market 'Dark Arts Trilogy' of High Frequency Trading: A Research Agenda' (2017) 32 *Journal of Information Technology* 111.

[186] For discussion on how financial innovation is linked to systemic risk see I. Chiu 'Fintech and Disruptive Business Models in Financial Products, Intermediation and Markets - Policy Implications for Financial Regulators' (2016) 21 *Journal of Technology Law and Policy* 55.

[187] M. Lenglet and J. Mol, 'Squaring the Speed of Light? Regulating Market Access in Algorithmic Finance' (2016) 45 *Economy and Society* 201. Also, see I. Moosa, 'The Regulation of High-Frequency Trading: A Pragmatic View' (2015) 16 *Journal of Banking Regulation* 72.

means that all parties can see all the institutional and retail buy and sell orders.[188] Secondly, it allows the party early access to execution.[189] A hedge fund would want DMA access to obtain the information on the stock exchange's order book and to be milliseconds ahead of other market participants in having its orders executed. This order information and the time-saving of milliseconds can be the difference between profit and loss when an announcement is published or when a market event occurs.[190] Typically, retail investors and even small investment firms cannot benefit from DMA. DMA is only applicable to strategies where the opportunity is eroded within milliseconds, and the firm has the necessary technical expertise to operate such a strategy. Therefore, typically only hedge funds and other private investment firms that specialise in algorithmic trading, known as high-frequency trading (HFT), have access to DMA.[191]

HFT is a subset of algorithmic trading specific to small-sized orders that are frequently traded to benefit from minute changes in pricing on a per-millisecond basis.[192] Therefore, HFT has become an execution strategy synonymous with hedge funds, where technology is responsible for seeking out pricing differences and profit opportunities.[193] HFT then automatically executes orders through DMA capabilities without any human intervention.[194] For this reason, HFT is more suited to executing short-term arbitrage strategies where small

[188] K. Johnson, 'Regulating Innovation: High Frequency Trading in Dark Pools' (2017) 42 *Journal of Corporation Law* 857.
[189] *Ibid*.
[190] M. Maggio, M. Egan and F. Franzoni, 'The Value of Intermediation in the Stock Market' (2019) HBS Working Paper 20-016; available at: https://www.hbs.edu/faculty/Publication%20Files/20-016_492d7f3b-0c00-4321-b96f-4400b4d09c84.pdf (date accessed: 3 January 2026).
[191] Johnston, *supra* note 152, 861.
[192] G. Thompson, 'Time, Trading and Algorithms in Financial Sector Security' (2017) 22 *New Political Economy* 1.
[193] V. Van Kervel and A. Menkveld, 'High-Frequency Trading around Large Institutional Orders' (2019) 74 *The Journal of Finance* 47. D. MacKenzie, 'A Material Political Economy: Automated Trading Desk and Price Prediction in High-Frequency Trading' (2017) 47 *Social Studies of Science* 172.
[194] M. Baron, J. Brogaard, B. Hagströmer and A. Kirilenko, 'Risk and Return in High-Frequency Trading' (2019) 54 *Journal of Financial and Quantitative Analysis* 993.

differences are sought out and leveraged to make the opportunity economically viable.[195] The most common hedge fund strategies are centred around arbitrage of interest rates and currency rates, security prices, and market announcements and conditions.[196]

HFT can have both positive and negative consequences within financial markets.[197] Many predatory arbitrage strategies, such as latency arbitrage and dark pool arbitrage, have been developed, which benefit the HFT trader to the detriment of the market. This is why a 'front-running' concern arises when HFT allows market participants to access opportunities faster than those market participants that do not have DMA capabilities.[198] Front-runners can trade against disclosed trades on the stock exchange order book. Also, the HFT trader using DMA can drive up the price that a non-DMA trader has to pay. However, a more severe market impact can occur when human oversight of HFT is replaced with artificial intelligence (AI) and machine learning (ML). Under such circumstances, unintended consequences can occur in trading securities, representing market abuse and price manipulation.[199]

The parasitic and predatory nature of the front-running potential of HFT has been the substance of many high-profile lawsuits over the past decade.[200] However, it did not take long for regulatory measures to be introduced to curb risks associated with this market practice.[201]

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[195] Johnston, *supra* note 131, 855.
[196] *Ibid*., 856.
[197] J. Lee, and L. Schu, 'Algorithmic Trading Regulation: The Frameworks for Human Supervision and Direct Market Interventions' Working Paper of 14 January 2021, 5-6; available at SSRN: https://ssrn.com/abstract=3765882 (date accessed: 3 January 2026).
[198] V. Dalko and M. Wang, 'High-Frequency Trading: Order-Based Innovation or Manipulation?' (2020) 21 *Journal of Banking Regulation* 289.
[199] Lee and Schu, *supra* note 161, 18-20. Also, see A. Azzutti, W. Ringe and H. Siegfried Stiehl, 'Machine Learning, Market Manipulation and Collusion on Capital Markets: Why the "Black Box" matters' EBI Working Paper Series of 19 February 2021, 4.
[200] J. McCrank, 'Exclusive: SEC Targets Ten Firms in High Frequency Trading Probe - SEC Document' Reuters, 17 July 2014; available at: http://www.reuters.com/article/2014/07/17/us-sec-investigation-high frequencytradin-idUSKBN0FM2TW20140717 (date accessed: 3 January 2026).
[201] G. Balp and G. Strampelli, 'Preserving Capital Market Efficiency in the High-Frequency Trading Era' (2018) 2 *Journal of Law, Technology & Policy* 349.

The US, EU and the UK have all introduced rules to regulate market access.[202] Specifically, in the EU, HFT has been addressed in MiFID II through the requirement for HFT traders to register as such and to be authorised to execute HFT techniques, which are subject to a tick size regime.[203] Trading venues are also required to have systems in place to identify algorithmic trading and prevent it from creating a disorderly market. These rules aim to neutralise execution differences between trading venues in the EU by introducing minimum price increments that those trading venues can use.[204] Given the implementation of these regulatory measures, the use of HFT by hedge funds will not be addressed any further within the particular focus of this chapter.

The critical point of note for this research is that when technological advances remain unregulated, users can exploit these technologies to maximise gains.[205] This may also depend on the extent to which failures in the regulation of technology are causing or merely exacerbating pre-existing regulatory failures concerning the investment practices themselves. The regulation of the technology-enabled practice is the only way to create an even playing field between those who have access to the technology and those who do not. Therefore, a parallel can be drawn with the use of technology by hedge funds to access leverage in capital markets. In both cases, those with superior technological access or capability can achieve disproportionate advantages. The advantages can potentially distort markets or investment

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[202] Crump Lindsey, 'Regulating to Achieve Stability in the Domain of High-Frequency Trading' (2015) 22 *Michigan Telecommunications & Technology Law Review* 161.

[203] 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, [2014] OJ L173/349, Article 48-49. Article 49 states that tick sizes must be "calibrated to reflect the liquidity profile of the financial instrument in different markets" and individually adapted to each financial instrument; see Mark Buchanan and Liesbeth Baudewyn, Trade Size Changes Coming to Europe, CREDITSUISSE (2 October 2014). For a broader discussion on all HFT regulations under MiFID II, see J. Lee, and L. Schu, 'Algorithmic Trading Regulation: The Frameworks for Human Supervision and Direct Market Interventions' Working Paper, 8-13, January 14, 2021; available at SSRN: https://ssrn.com/abstract=3765882 (date accessed: 3 January 2026).

[204] See Final report on the tick size regime under MiFID II, Final Report Amendment to Commission Delegated Regulation (EU) 2017/588 (RTS 11), available at: https://www.esma.europa.eu/sites/default/files/library/esma70-156-834_final_report_on_the_proposed_amendments_to_rts_11.pdf (date accessed: 3 January 2026).

[205] A. Azzutti, W. Ringe and H. Siegfried Stiehl, 'Machine Learning, Market Manipulation and Collusion on Capital Markets: Why the "Black Box" matters' EBI Working Paper Series, 19 February 2021.

outcomes. Without regulation, these advantages can compound and lead to systemic inequalities where the most technologically equipped market actors consistently outperform. Hence, market success ceases to be determined by skill or strategy alone.

Having established the structure and investment characteristics of the hedge fund industry, the next step in achieving the objective of this chapter is to explain the definitional difficulty of the hedge fund industry and, based on the above assessment, to discern the defining characteristics of hedge fund activity for the purposes of this research.

1.6. Unrestrained speculative synthetic leveraging as defining a hedge fund

Another consideration in assessing what a hedge fund does is to focus on the development of the industry's use of leverage as part of its investment strategy. The purpose of this part is to combine the above assessment of the hedge fund industry with an overview of market developments to show that the defining characteristic of a hedge fund is no longer its ability to short-sell or engage in leveraging. Many other fund types can execute these techniques. The argument of this part – and of the entire chapter – is that hedge funds remain the only type of collective investment scheme in the fund industry that can engage in synthetic leveraging for speculative purposes on a wholly unrestrained basis. This is the defining characteristic of hedge funds.

The first section will explain the definitional difficulty associated with the hedge fund industry. The second section will explain how hedge funds moved away from hedging vehicles to becoming speculative risk-takers. The third section will outline how hedge funds developed into a significant user of synthetic leverage within the repo market, and the section

proposes unrestrained speculative synthetic leveraging as the characteristic that most suitably defines a hedge fund today.

1.6.1 The hedge fund industry's definitional dilemma

Nowhere is the complexity associated with the hedge fund industry more evident than in the conundrum concerning the term's definition.[206] There is a lack of consensus at the EU and global level on an accepted legal definition of hedge funds, particularly since EU regulation now defines an umbrella category of Alternative Investment Funds (AIFs),[207] of which hedge funds are a constituent. Pre-AIFMD, individual jurisdictions regulated hedge funds through national private placement regimes and, in some cases, defined hedge funds at a national level.[208] Therefore, this section will review some of those national interpretations of the term hedge fund to discern notable characteristics. However, this is not intended to be an exhaustive comparative study.

Certain EU jurisdictions have attempted to define hedge funds by reference to what hedge funds do from an investment strategy perspective.[209] In general, funds that follow what are

[206] T. Bullman, 'Hedge Funds and the Definition Challenge – Part 1' (2008) 15 *Commercial Law Practitioner* 14. T. Bullman, 'Hedge Funds and the Definition Challenge – Part II' (2008) 15 *Commercial Law Practitioner* 31.

[207] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1.

[208] This has been a significant force behind regulatory arbitrage. Also, without a definition of what a hedge fund is there has been a lack of data from funds confirming themselves as hedge funds. Therefore, there has been a lack of agreement on the size of the global hedge fund industry. See H. Nabilou and A. Pacces, 'The Hedge Fund Regulation Dilemma: Direct vs. Indirect Regulation' (2015) 6 *William & Mary Business Law Review* 183. D. McBarnet, 'Financial Engineering or Legal Engineering? Legal Work, Legal Integrity and the Banking Crisis' in I. MacNeil and J. O'Brien (eds), *The Future of Financial Regulation* (London: Hart Publishing, 2010) 72. H. Nabilou, 'The Conundrum of Hedge Fund Definition' (2017) 14 *European Company and Financial Law* Review 150.

[209] Luxembourg Circular CSSF 91/75. However, on the 13 February 2007 the previous 1991 law relating to Specialised Investment Funds in Luxembourg was amended to broaden the scope of eligible investors into SIFs. This extra flexibility, along with some amendments to the tax regime and listing process to coincide, was advantageous to hedge funds. Fonds commun de placement (FCP) was a type of contractual fund. However, this was not the most commonly used investment vehicle for hedge funds. Société d'Investissement À Capital Variable (SICAVs) was a legal structure in both France and Luxembourg but did not specifically relate to hedge

considered to be alternative investment strategies are more likely to be defined as hedge funds rather than as UCITS funds. Other jurisdictions focus on the investment strategy, but from the perspective of whether or not the strategy is based on the practice of leveraging or short-selling.[210] Therefore, the definition of a hedge fund tends to be determined by a fund's strategy, combined with specific investment practices such as leveraging. Other jurisdictions have elaborated upon this even further by referencing a hedge fund's unrestrained ability to invest.[211] By and large, the most comprehensive definitions refer to the investment practices, the investment strategies, and the unrestrained manner in which the fund operates.

In *Goldstein v. SEC*., the US Court of Appeals for the District of Columbia addressed the problem and reflected the global hedge fund definition conundrum when it stated:

> 'Hedge funds' are notoriously difficult to define. The term appears nowhere in the federal securities laws, and even industry participants do not agree upon a single definition. The term is commonly used as a catch-all for 'any pooled investment

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funds. It was simply an open-ended variable capital fund structure. Not all SICAVs were hedge funds but hedge funds could be established as SICAVs. Société d'Investissement À Capital Fixe (SICAFs) was a legal structure in Luxembourg but again did not specifically relate to hedge funds. It was simply a closed-ended fixed capital fund structure. Not all SICAFs were hedge funds but hedge funds could be established as SICAFs. See Martin Cornish and Ian Mason, International Guide to Hedge Fund Regulation, Bloomsbury Professional (2009), 309.

[210] In France, hedge funds were defined based on the strategy being followed. Funds could be registered as funds of alternative funds (which in essence are funds of hedge funds), "ARIA" funds which contained lighter investment restrictions, and, "ARIA EL" funds which contained similar restrictions to ARIA funds but would allow more extensive use of leverage. See Monetary and Financial Code Articles L.214-35 and L.214-35-1 (ARIA funds), and Monetary and Financial Code Articles L.214-35-2 to L.214-35-6 (ARIA EL). Also, see Martin Cornish and Ian Mason, International Guide to Hedge Fund Regulation, Bloomsbury Professional (2009), p.111. South Africa introduced a statutory definition of the term "hedge fund" on 29 August 2007. Section 2(a), Notice on Codes of Conduct for Administrative and Discretionary FSPs Amendments Notice, 2007 [Board Notice 89 of 2007] states:

"Hedge fund" means a portfolio which uses any strategy or takes any position which could result in the portfolio incurring losses greater than its aggregate market value at any point in time, and which strategies or positions include but are not limited to-
(a) leverage; or
(b) net short positions.

[211] In Denmark, investment vehicles known as 'hedge associations' were used. A hedge association was unrestrained and could invest in a diverse set of instruments including shares, bonds and derivatives. Although a hedge association was not required to adhere to diversification rules, any strategy and leverage limits had be disclosed. Chapter 16a, Investment Associations and Special Purpose Associations Consolidated Act & Bill L55 of 31 January 2006.

vehicle that is privately organized, administered by professional investment managers, and not widely available to the public.'[212]

However, jurisdictions are increasingly inclined to define hedge funds by reference to what they are not. In other words, hedge funds are identified as a category of investment vehicles not authorised as retail funds. This usually occurs through carve-outs and safe harbours for private funds that are restricted to being distributed to institutional investors. [213] Since its inception, the growth of the global hedge fund industry has very much been influenced by available regulatory exemptions in the US, which meant that hedge funds were identified by what they were not. [214] Regulators appear more disposed to side-stepping the issue of defining hedge funds by simply referencing what they are not.

This definitional dilemma has been perpetuated under AIFMD's current definition of AIFs, including hedge funds as a sub-category. The definition operates by looking at *what the fund is not* rather than *what the fund is*.[215] AIFMD defines an AIF as a collective investment

[212] *Goldstein v SEC* (2006) 451 F.3d 873

[213] In the US private funds have been able to benefit from extensive carve-outs and safe harbours. See section 4(2) and Rule 501(a) of the Securities Act, 1933. Rule 506 of Regulation D. Section 15b of the Securities Exchange Act, 1934. Section 3(c)(1) and 3(c)(7) of the Investment Company Act, 1940. Section 203(b) of the Investment Advisers Act, 1940. However, in 2010 the US did introduce a definition of a 'private fund' to deal with regulatory arbitrage issues connected to this network of carve-outs through section 402(a)(29) of the U.S. Private Fund Investment Advisers Registration Act of 2010 (the Private Fund Act) in which a hedge fund is a sub-category of a private fund.

[214] Registration as a public offering under the Securities Act of 1933 was not required if the offering was privately marketed to selected investors. See the Securities Act of 1933, Section 4(2). For further analysis see D. Hammer et al, *U.S. Regulation of Hedge Funds* (Chicago: American Bar Association , 2005), 111-113. Such offerings, therefore, fell outside the remit of reporting requirements under the Securities Exchange Act of 1934. See the Securities Exchange Act of 1934, Section 3a4-1. For further analysis see D. Hammer et al, *U.S. Regulation of Hedge Funds* (Chicago: American Bar Association , 2005), 241-243. The introduction of the Investment Company Act of 1940, requiring fund registration, provided for a regulatory exemption from the Securities & Exchange Commission (SEC) oversight. This exemption was given to a fund on the basis that the fund was a private investment vehicle made up exclusively of 'qualified investors', and that the fund was not available to the general public. See the Investment Companies Act of 1940, Section 3(c)(7). For further analysis see D. Hammer et al, *U.S. Regulation of Hedge Funds* (Chicago: American Bar Association , 2005), 74-77. On the same basis, the registration requirements under the Investment Intermediaries Act of 1940 provided for an exemption if a fund's manager was considered to be a private investment adviser. See the Investment Adisers Act of 1940, Section 203(b). For further analysis see D. Hammer et al, *U.S. Regulation of Hedge Funds* (Chicago: American Bar Association , 2005), 11-15.

[215] Nabilou, *supra* note 172..

scheme not authorised under the UCITS Directive.[216] As incisively recognised by Nabilou, this definitional difficulty is 'so deeply ingrained in the hedge funds-regulation debate that legislators and regulators simply sweep the definitional issue under the rug to avoid having to define hedge funds.'[217]

The question may be asked why it is so important to define hedge funds. The importance of defining hedge funds boils down to one simple argument. If hedge funds are not defined, the regulatory arbitrage of being able to self-identify will be perpetuated within the hedge fund industry. An unrestrained industry may unwittingly develop as a systemic risk within financial markets.[218] This inclination towards regulatory arbitrage is particularly visible under AIFMD, where funds are actively choosing not to identify their category of AIF in reporting.[219] If a risk is not visible by the AIF category, then regulatory intervention at the sector level may not be targeted sufficiently to combat the threat. For example, private equity funds and hedge funds are very different. If they all select the 'other AIF' or 'none' rather than 'private equity' and 'hedge fund' as their category, it may not be easy to determine in which sector a systemic risk is originating. This could result in an ineffective supervisory response.

1.6.2 From hedging to a speculative focus

[216] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1.
[217] Nabilou, *supra* note 172, 152.
[218] *Ibid*., 170.
[219] The impact of not defining hedge funds is already visible in the 2019 mandatory disclosure regime data of AIFMD where over 61 per cent of AIFs reported themselves as 'other AIF' and 487 out of 30,357 selected 'none' as their AIF type. See European Securities and Markets Authority, *ESMA Annual Statistical Report: EU Alternative Investment Funds 2020* (2020), 6, 27, 35; available at: https://www.esma.europa.eu/sites/default/files/library/esma50-165-1006_asr-aif_2020.pdf (date accessed: 3 January 2026). See 2.2.1. for further discussion on regulatory arbitrage.

The US investor, Alfred Winslow Jones, is commonly cited as pioneering the hedge fund movement when he created the first hedge fund in 1949.[220] Jones focused on the relationship between the concepts of financial leveraging and short-selling of equities in an investment technique. This coupled technique aimed to hedge the risk in a portfolio represented by the potential of a stock market fall in prices.[221]

As outlined above, short selling is the practice of selling perceived overpriced securities at the current price.[222] This practice is undertaken in the hope that the securities will fall in price and will be repurchased at a lower price. However, the short sale is paired with a simultaneous long purchase of shares. This is referred to as pair trading.[223] The downside risk of a fall in the price of the long equity position will be offset or hedged by the counterbalancing profit on the short position.[224] This hedging or elimination of the risk that a security price may fall is referred to as a market-neutral strategy.[225] The concept of using leverage with this pair trading model simply magnifies the potential profit level created by a movement in either the long or short side of the portfolio position.[226]

Leveraging has increasingly taken precedence as hedge funds search for higher returns to meet their absolute return objective. Regulatory arbitrage opportunities and the resulting growth of the repo market have facilitated a structural shift as institutions moved their

[220] M. Bodellini, 'From Systemic Risk to Financial Scandals: The Shortcomings of U.S. Hedge Fund Regulation' (2017) 11 *Brooklyn Journal of Corporate, Financial & Commercial Law* 417, 425 fn 28.
[221] G. Connor and M. Woo, 'An Introduction to Hedge Funds' (2004) Discussion Paper 477, Financial Markets Group, London School of Economics and Political Science, 12; available at: https://eprints.lse.ac.uk/24675/1/dp477.pdf (date accessed: 3 January 2026)
[222] Hunanyan, *supra* note 120.
[223] M. Blázquez, C. De la Orden De la Cruz, and C. Román, 'Pairs Trading Techniques: An Empirical Contrast' (2018) 24 *European Research on Management and Business Economics* 160.
[224] Bodellini, *supra* note 184, 425 - 426.
[225] A. Ayala and S. Blazsek, 'Equity Market Neutral Hedge Funds and the Stock Market: An Application of Score-Driven Copula Models' (2018) 50 *Applied Economics* 4005.
[226] M. Bodellini, 'Does It Still Make Sense, From the EU Perspective, to Distinguish Between UCITS and Non-UCITS Schemes?' (2016) 11 *Capital Markets Law Journal* 528.

financing models from bank-based financial leverage to market-based synthetic leverage.[227] Through derivatives[228] and repo[229] market developments, hedge funds have speculatively explored previously unregulated corners of the financial markets.[230]

The catalyst behind the growth in the derivatives market has been the ability to bilaterally agree derivatives contracts off-exchange in trades called over-the-counter (OTC). The catalyst behind the growth in the repo market has been its relationship with government bond markets, specifically the US Treasury market.[231] Dealers could more cheaply finance the purchase of Treasury bonds through a repo rather than buying with borrowed cash. Prime brokers were happy to take risk-free US Treasury bonds over other riskier corporate bonds.[232] Therefore, the derivatives and repo markets represented a new form and source of leverage for market participants such as hedge funds.

1.6.3 Defining hedge funds and the role of synthetic leverage

The Bank for International Settlements (BIS) has reported the trading volume in the EU repo market since 2000, albeit for the portion that has been centrally cleared.[233] By 2007, repo

[227] World Economic Forum, 'Rethinking Financial Innovation: Reducing Negative Outcomes While Retaining The Benefits', 17, 26 April 2012; available at: http://www3.weforum.org/docs/WEF_FS_RethinkingFinancialInnovation_Report_2012.pdf (date accessed: 3 January 2026).
[228] A derivatives trade, in its simplest terms, is a security that has its value derived from an underlying instrument.
[229] A repo or reverse repo trade is different from a derivative because such trades are merely a sale with a repurchase agreement for a later date in time. See H. Nabilou, 'Repo Markets Across the Atlantic: Similar but unalike' (2018) 30 *European Business Law Review* 517.
[230] H. Nabilou, 'Regulatory Arbitrage and Hedge Fund Regulation: The Need for a Transnational Response' (2017) 22 *Fordham Journal of Corporate & Financial Law* 556.
[231] H. McVea, 'Restorng Regulatory Credibility and Preventing 'Repo Runs': A Cautionary Tale' (2019) 30 *European Business Law Review* 9.
[232] D. Gabor, 'The (Impossible) Repo Trinity: The Political Economy of Repo Markets' (2016) 23 *Review of International Political Economy* 968.
[233] Bank for International Settlements, 'Euro repo market functioning: collateral is king' December 2019, 96; available at: https://www.bis.org/publ/qtrpdf/r_qt1912k.pdf (date accessed: 3 January 2026).

financing in the US and EU was at an all-time high of approximately €100 billion.[234] However, the BIS reported that the euro-denominated repos outstanding at the end of 2018 were €500 billion. Hence, since the global financial crisis, synthetic borrowing options available through the repo market have become mainstream for investors.[235] Increasingly, Securities Financing Transactions (SFTs)[236] are being used by EU investment vehicles to access finance post-global financial crisis. This is becoming a popular source of finance in addition to cash borrowing and using derivatives. Repo transactions constitute a significant type of SFT traded within the EU.[237]

In terms of the evolution of the hedge fund industry since 2000, synthetic leverage has replaced financial leverage within capital markets as the model of choice for hedge funds.[238] In quantifying this structural change in the market, it is necessary to review the synthetic leveraging data collected in the UK, where the preponderance of hedge fund managers is located. Based on Financial Conduct Authority (FCA) data of UK hedge funds, by 2014, only 2 per cent of hedge fund leverage was financial. The residual 98 per cent of leverage used by hedge funds was synthetic leverage, obtained through the repo and derivatives markets.[239] ESMA aggregated data across the EU and reported that by the end of 2018, 60 per cent of EU

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[234] H. Nabilou and A. Prüm, 'Shadow Banking in Europe: Idiosyncrasies and their Implications for Regulation' (2019) 10 *European Journal of Risk Regulation* 789. The size and dependence of the financial industry upon the repo market have been directly connected to the collapse at Bear Stearns Companies Inc., Lehman Brothers Holdins Inc., and Northern Rock. See also, Bank for International Settlements, *supra* note 197, 97.
[235] Nabilou, *supra* note 198, 789. Although there has never been a definition of this sector it is generally accepted as non-bank institutions that engage in functions that previously were undertaken through a bank.
[236] *Ibid*., fn 34.
[237] C. Bassi, M. Grill, F. Hermes, H. Mirza, C. O'Donnell, and M. Wedow, 'Enhancing Repo Market Transparency: The EU Securities Financing Transactions Regulation' (2025) 11(1) *Journal of Financial Regulation* 98.
[238] D. Fricke, 'Synthetic Leverage and Fund Risk-Taking' (2025) 154 *Journal of International Money and Finance* 1. H. McVea, 'Restorng Regulatory Credibility and Preventing 'Repo Runs': A Cautionary Tale' (2019) 30 *European Business Law Review* 1. I. Yadav and R. Mishra, 'The Global Hedge Fund Industry: Structure, Strategies and Growth' (2017) 18 *Global Business Review* 955. A. Johnson, 'Regulating Hedge Funds for Systemic Stability: The EU's Approach' (2015) *European Law Journal* 758. Also, see Bank of England, 'Have hedge funds increased their use of repo borrowing?' 7 February 2020, available at: https://www.bankofengland.co.uk/bank-overground/2020/have-hedge-funds-increased-their-use-of-repo-borrowing (date accessed: 3 January 2026).
[239] Johnston, *supra* note 131, 764.

hedge fund financing came from the use of the repo market. The residue was predominantly financed through cash borrowing and derivatives markets.[240] This contrasts with other jurisdictions where hedge funds may rely on a different mix of financing sources, highlighting structural differences in funding patterns across Europe. Whilst such a structural move towards repo-based financing will undoubtedly deepen capital markets within the EU, ESMA acknowledges that 'this structural change could harbour risks and vulnerabilities which might affect financial stability and the financing of the real economy more broadly.'[241] Therefore, these data serve to illustrate EU hedge fund financing structures and to signal potential systemic risks associated with their evolution.

Building on the broader trend of structural transformation in EU hedge fund financing there is scholarship, most notably Moloney's analysis of EU capital markets and investment fund regulation, which highlights how divergent regulatory and institutional conditions have shaped this evolution across jurisdictions.[242] While a shift towards alternative financing models is observable across the EU, Moloney emphasises that its pace and character have been uneven, reflecting differences in market depth, regulatory design, and financial intermediation structures. A comparison between EU Member States and the UK is particularly instructive in this respect, as it illustrates how contrasting financial architectures and regulatory trajectories have influenced the development of hedge fund financing models.

Drawing on Moloney's account, the UK is characterised by a historically dense concentration of hedge fund investment managers operating within a highly developed capital markets ecosystem, which has been comparatively receptive to financing innovation. By contrast, EU

[240] ESMA, *supra* note 96, 20 and 50-51.
[241] *Ibid*.
[242] N. Moloney, 'Bending to Uniformity: EU Financial Regulation with and without the UK' (2017) 40 *Fordham International Law Journal* 1335.

jurisdictions such as the Netherlands have undergone a more gradual adjustment, a development Moloney links to the continued prominence of traditional banking institutions and the relatively smaller scale of domestic asset management sectors. Although these jurisdictional differences persist, Moloney observes that synthetic leveraging has nonetheless emerged as the dominant financing model within the hedge fund industry across both the EU and the UK.[243]

This convergence suggests that the increasing reliance on synthetic leverage is not purely a market-led phenomenon, but one that is closely conditioned by regulatory structures and institutional configurations. This is a theme that recurs throughout Moloney's broader analysis of post-crisis financial regulation. [244] Chapter 2 builds on this foundation by examining synthetic leveraging in greater detail and assessing the extent to which it may give rise to systemic risk.

1.7. Conclusion

As an unrestrained form of asset management, the hedge fund industry has become known for using complex structuring and investment strategies to deliver absolute returns for investors. Unrestrained speculative investment techniques are used by hedge funds to magnify the rate of return of an investment.[245] This magnification is even possible when markets fall through short-selling, an economic phase that often increases investor appetite for hedge funds.[246]

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[243] *Ibid*.
[244] Moloney, *supra* note 206,1343-1346.
[245] P. Breur, 'Measuring Off-Balance Sheet Leverage' (2000) *IMF Working Paper* WP/00/202, 5; available at: https://www.imf.org/external/pubs/ft/wp/2000/wp00202.pdf (date accessed: 3 January 2026).
[246] Preqin, *Investor Update: Alternative Assets H2 2020*, 19 August 2020. Institutional investors with exposure to hedge fund vehicles were surveyed to assess their allocation adjustments into hedge funds during the COVID-19 pandemic. 44 per cent indicated an intention to increase their allocation to hedge funds in the coming year, double the allocation of 2019. European Securities and Markets Authority, *ESMA Annual*

The objective of this chapter has been to identify what a hedge fund is. In so doing, this chapter has explored the most common characteristics of a hedge fund. Further, it introduced the issue of leverage and its evolution as the defining characteristic of the hedge fund industry. As demonstrated in Part 1.2 and Part 1.3, a hedge fund's distinctive cross-jurisdictional operational structure is driven by taxation and regulatory considerations. The regulation of the EU hedge fund industry, together with Brexit, has had a transformational impact on the EU hedge fund landscape.

Part 1.4 used Ireland as an EU case study to illustrate how a hedge fund is structured and serviced in practice. The functions of the AIFM, the AIF, and key service providers were examined, and the regulatory, legal, and fund options available to an Irish-domiciled hedge fund were outlined in order to disentangle the complexity surrounding how a hedge fund structure is chosen. Part 1.5 examined the unique objectives, investment practices, and investment strategies pursued by hedge funds. This analysis highlighted the central role that leverage plays in hedge fund activity, from enabling managers to achieve performance thresholds such as the high-water mark to executing strategies designed to profit across differing market conditions, including market downturns. Part 1.6 discussed the evolution of the hedge fund industry towards an increased reliance on speculative and unrestrained synthetic leverage. This form of leverage was identified as the defining characteristic of the hedge fund industry today. These foundational explanations of what hedge funds are and what they do are necessary before examining in greater depth the hedge fund practices most closely connected to systemic risk. Chapter 2 will build on this foundation by analysing synthetic leveraging as a key hedge fund practice capable of amplifying systemic risk.

Statistical Report: EU Alternative Investment Funds 2020 (2020), 10; available at: https://www.esma.europa.eu/sites/default/files/library/esma50-165-1006_asr-aif_2020.pdf (date accessed: 3 January 2026).

Chapter 2 HEDGE FUND LEVERAGE AS A SYSTEMIC RISK

2.1. Introduction

As discussed in Chapter 1, hedge funds' risky and opaque nature has resulted in particular concerns over the role that their leveraging practices have played in heightening the systemic risk of financial markets. This chapter seeks to examine the relationship between systemic risk and the forms of hedge fund leverage. This will be accomplished through an assessment of (1) how hedge funds access different forms of synthetic leverage, (2) how this leverage increases portfolio risk at a micro-level, and (3) how the accumulation and transmission of individual hedge fund leverage and portfolio risk contribute to systemic risk at a macro-level. In achieving these aims, the chapter will include references to existing leverage and systemic risk survey data on leveraging within the hedge fund industry, as previously published by the Financial Stability Board (FSB)[247] and ESMA post-financial crisis.[248]

The chapter will be divided into two parts. Part 2.2 will examine how regulatory arbitrage has materially altered the landscape for portfolio financing. As bank-based financial leverage through cash borrowing is replaced by market-based leverage options such as derivatives and repos, this has a resulting impact on hedge fund portfolio risk profiles. Derivative and repo markets and products will be examined. These forms of leverage are referred to as synthetic

[247] The Financial Stability Board replaced the Financial Stability Forum in April 2009 to address the lack of pre-crisis coordination of G7 and G20 members in combatting systemic risk within financial markets. For a full explanation of the need and consequences of this change see C. Soto Crespo, 'Explaining the Financial Stability Board: Path Dependency and Zealous Regulatory Apprehension' (2017) 5 *Penn State Journal of Law & International Affairs* 302.

[248] The European Securities and Markets Authority (ESMA) replaced the Committee of European Securities Regulators (CESR) in January 2011 to address regulatory and supervisory failing which played a part in the financial crisis. For a full explanation of regulatory and supervisory role ESMA now fulfils see E. Howell, 'The Evolution of ESMA and Direct Supervision: Are There Implications for EU Supervisory Governance' (2017) 54 *Common Market Law Review* 1027.

because the leverage simulates the characteristics of another asset.[249] This access to synthetic leverage will be further examined in terms of how it is reflected in the most commonly used industry risk modelling practices. Part 2.3 will explore the origins of systemic risk as it pertains to leveraged hedge funds. This requires an assessment of the definitions and theories concerning systemic risk. Further, an examination will be undertaken of the phases or stages of systemic risk and the impact of interconnectedness within financial markets, as interconnectedness relates to the hedge fund industry.

This chapter demonstrates that regulatory arbitrage has been a catalyst for a structural shift in capital markets, whereby market-based leveraging models are evolving to compete with the more traditional bank-based models.[250] Further, this structural shift has significantly influenced and increased hedge funds' access to leverage. The changes in leverage levels and portfolio risk profiles have ultimately generated concerns relating to the potential collective systemic impact of the hedge fund industry within financial markets.

2.2. Hedge fund access to leverage

In order to more fully understand why systemic risk may materialise due to hedge fund leverage, it is essential to understand *why* and *how* hedge funds' access to leverage has changed over the last decade. As will be shown in this part, the reason *why* hedge funds are accessing different forms of leverage is because regulatory arbitrage opportunities offer a

[249] European Systemic Risk Board, ' Synthetic Leverage and Fund Risk-Taking' 1, September 2021; available at: https://www.esrb.europa.eu/pub/pdf/wp/esrb.wp126~a79efbca24.en.pdf?5387b0aa29284c9b662e07846f12d1dd (date accessed: 4 January 2026). IOSCO, 'IOSCO Report: Leverage' 38, November 2018, available at: https://www.iosco.org/library/pubdocs/pdf/IOSCOPD615.pdf (date accessed: 4 January 2026). European Central Bank, 'Financial Stability Review' May 2015, 92; available at: https://www.ecb.europa.eu/pub/pdf/fsr/financialstabilityreview201505.en.pdf (date accessed: 4 January 2026). Also, see 1.5.3.1. for a discussion on leverage.

[250] See 1.3.

lower regulatory burden and cost of finance for the hedge fund. It will further be shown *how* hedge funds are now accessing leverage through market-based synthetic instruments rather than traditional bank-based financial borrowing.

Therefore, this part first examines regulatory arbitrage as the mechanism that has influenced the structural shift in capital markets from a bank-based to a market-based model and which has consequently fuelled hedge fund leverage. Secondly, the difference between bank-based and market-based financing will be explained. Thirdly, the market-based synthetic leverage options available to hedge funds will be described. Fourthly, the impact of this leveraging on the portfolio risk profile of hedge funds will be outlined.

2.2.1. Regulatory arbitrage as a force behind the structural shift in leverage access

Regulatory arbitrage operates at two levels.[251] It can operate at a jurisdictional level. A hedge fund can domicile itself in a regulatory jurisdiction where the regime is considered light or relatively lenient in standards.[252] Therefore, regulatory arbitrage becomes a way for jurisdictions to compete with each other.[253] Also, regulatory arbitrage can operate at a product or market level. A hedge fund within a regulated environment may begin to transact in products that are not yet or are lightly regulated. Therefore, markets or channels compete with each other for transaction fees. This is the difference between 'inter-jurisdictional' and

[251] C. Goodhart, 'The Boundary Problem in Financial Regulation' (2008) 206 *National Institute Economic Review* 48.
[252] H. Nabilou, 'A Tale of Regulatory Divergence: Contrasting Transatlantic Policy Responses to the Alleged Role of Alternative Investment Funds in Financial Instability' (2017) 12(1) *Capital Markets Law Journal* 116 - 121. M. Brocard and F. Lhabitant, 'A Primer on the Tax Framework of Offshore and Onshore Hedge Funds' (2016) *EDHEC Risk Institute Paper* 3.
[253] T. Beck, C. Silva-Buston and W. Wagner, 'Supervisory Cooperation and Regulatory Arbitrage' (2025) 29(2) *Review of Finance* 381. A. Demirgüç-Kunt, B. Horváth and H. Huizinga, 'Regulatory Arbitrage and Loan Location Decisions by Multinational Banks' (2023) 145 *Journal of International Economics* 1.

'intra-jurisdictional' regulatory arbitrage.[254] This differentiation exists for two reasons. There can be differing regulatory treatment for economic activities which are essentially the same,[255] and there may also be ambiguity in the interpretation of applicable laws.[256] Stated another way, 'regulatory arbitrage exploits the gap between the economic substance of a transaction and its legal or regulatory treatment.'[257]

Regulatory arbitrage is an 'indispensable element' in regulatory competition as it offers hedge funds a choice.[258] Regulatory competition at a jurisdictional level, as is the case with taxation, is a way for countries to compete with each other to attract direct foreign investment. A similar concept applies to regulatory competition between markets that hedge funds access, such as capital markets or money markets. These markets compete with each other for the transaction fees of participants.[259]

Regulatory arbitrage operates at several levels. At the broadest level, it occurs between major regulatory blocs. For example, it operates between the EU, the UK, and the US. At a narrower level, it occurs between jurisdictions within the same regulatory framework. It is this second, intra-EU level that is most relevant here. The inter-jurisdictional arbitrage that occurs within the EU single market is most clearly linked with the divergence between national supervisory authorities. This means that although the EU seeks a common regulatory framework to apply to hedge funds, the implementation and supervisory oversight of the framework differ across all Member States because implementation and enforcement differ across Competent Authorities. This is the arbitrage opportunity that hedge funds seek to

[254] H. Nabilou, 'Regulatory Arbitrage and Hedge Fund Regulation: The Need for a Transnational Response' (2017) 22(4) *Fordham Journal of Corporate & Financial Law* 556.
[255] *Ibid*., 562-563.
[256] *Ibid*., 566.
[257] V. Fleischer, 'Regulatory Arbitrage' (2010) 89(2) *Texas Law Review* 229.
[258] Nabilou, *supra* note 8, 557.
[259] See 1.3.

benefit from. They can select to domicile or be regulated themselves, or their funds, in an EU domicile that offers the most beneficial scenario in terms of allowing them to remain as unrestrained as possible in their investing activities and practices, and therefore to maximise profits. This has resulted in a battle between Ireland and Luxembourg for dominance in attracting AIFMs, AIFs and support services such as administrators, depositaries and custodians.[260] The issue that this creates is that when the hedge fund industry is focused on one or two jurisdictions within the EU, it can lead to intra-jurisdictional regulatory arbitrage specifically between those Member States, because each has such large markets and regulatory frameworks that diverge in practice despite their common legislative origin. Although Ireland and Luxembourg are used as examples in this section, the regulatory arbitrage under consideration in this research is not confined to any two jurisdictions. Rather, as a strategy hedge funds select from a wider range of competing domiciles, both within and outside the EU. This selection depends on which jurisdiction offers the most favourable regulatory and taxation environments. The most selected jurisdictions include Ireland, Luxembourg, Malta, Singapore, the Cayman Islands, the British Virgin Islands, and Jersey.[261]

The European Securities and Markets Authority (ESMA) is the EU body trying to create balance in the struggle to address the challenges of regulatory arbitrage. ESMA's mandate is to promote a single EU-wide supervisory structure that is interpreted, implemented and enforced the same way across all EU Member States. ESMA does this through binding standards, implementation guidance, and published FAQs. However, it does not directly

[260] International Organization of Securities Commissions, 2025 Investment Funds Statistics Report (FR/01/26), March 2026; availavle at: https://www.iosco.org/library/pubdocs/pdf/IOSCOPD816.pdf (date accessed: 13 May 2026). IMF, 'Luxembourg: Financial Sector Assessment Program — Technical Note on Investment Funds: Regulation and Supervision' (IMF Staff Country Reports, vol 2024, issue 181, International Monetary Fund 2024); available at: https://www.elibrary.imf.org/view/journals/002/2024/181/article-A001-en.xml (date accessed: 13 May 2026).

[261] S. Firth, 'Global Trends in Hedge Fund Domiciliation' (2023) *IFC Review* ; available at: https://www.ifcreview.com/articles/2023/november/global-trends-in-hedge-fund-domiciliation/ (date accessed: 13 May 2026).

supervise Competent Authorities or market participants. This is the exact structural limitation which perpetuates the inter-jurisdictional and intra-jurisdictional regulatory arbitrage opportunities within the EU. This structural limitation is significant at two levels. Firstly, it perpetuates intra-EU regulatory arbitrage between Member States. This occurs when there is divergent implementation of a common legislative framework by national Competent Authorities. This opens the door to hedge funds exploiting differences within the EU single market. Secondly, it contributes to broader inter-jurisdictional arbitrage between the EU and third-country regulatory blocs such as the UK and the US. The absence of a fully harmonised and consistently enforced EU-wide supervisory regime weakens the EU's regulatory standing relative to competing UK and US frameworks. It is therefore the intra-EU dimension, and the consequent need for a harmonised supervisory regime across EU Member States, that is the primary concern of this research.

Regulatory arbitrage can be seen as a loophole that allows a market participant to choose the market on which it transacts, which offers the least regulatory burden and transaction fees. Through regulatory arbitrage, market-based financing has evolved to offer market participants a synthetic leverage option to rival financial leverage provided by banks.[262] This is at the core of the changing trends in hedge funds' accessing leverage options, because it has enabled the growth of market-based portfolio financing alternatives to bank-based financial borrowing. However, the attraction of reduced regulatory burden and associated costs can result in mass-market migration of hedge fund practices in order to remain an unrestrained form of asset management. This market-wide herding search for efficiency can create risk at a macro level. Therefore, critics cite regulatory arbitrage as a significant source

[262] M. Brunnermeier, S. Rother and I. Schnabel, 'Asset Price Bubbles and Systemic Risk' (2020) 33(9) *The Review of Financial Studies* 2304.

of potential systemic risk.[263] Further, regulatory arbitrage can act as a mechanism for creating and moving systemic risk around the market.[264]

It is this intersection between intra-jurisdictional arbitrage and the structural evolution of hedge fund leverage that this chapter is most concerned with. Hedge funds are moving away from traditional forms of leverage and moving more towards new, unregulated synthetic forms of leverage. The move into financing through the repo market is a clear example of a product-level arbitrage that was historically very lightly regulated. This created a significant challenge for ESMA in terms of regulatory intervention, data reporting, assessment of exposures and how to understand the market. The following section will address this structural shift with reference to data that ESMA has collected through its supervisory and data-gathering role.

2.2.2. The structural shift from bank-based to market-based leveraging

The EU's Action Plan for Capital Markets Union,[265] now succeeded by the Savings and Investments Union (SIU),[266] supported the evolution of alternative lenders within the market. However, benefits to capital markets from increased liquidity can be accompanied by

[263] A. Minto, S. Prinz & M. Wulff, 'A Risk Characterization of Regulatory Arbitrage in Financial Markets' (2021) *European Business Organization Law Review* 397; D. Busch, M. Rijn, 'Towards Single Supervision and Resolution of Systemically Important Non-Bank Financial Institutions in the European Union' (2018) 19(2) *European Business Organization Law Review* 301; H. Nabilou, 'Regulatory Arbitrage and Hedge Fund Regulation: The Need for Transnational Response' (2017) 22(4) *Fordham Journal of Corporate & Financial Law* 556.
[264] S. Cecchetti, M. Mohanty and F. Zampolli, 'The real effects of debt' BIS Working Paper No. 352; available at: https://www.bis.org/publ/work352.htm (date accessed: 4 January 2026).
[265] European Commission, Capital markets union 2020 action plan: A capital markets union for people and businesses; available at: https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/capital-markets-union/capital-markets-union-2020-action-plan_en (date accessed: 4 January 2026).
[266] European Commission, Savings and Investment Union; available at: https://finance.ec.europa.eu/regulation-and-supervision/savings-and-investments-union_en (date accessed: 4 January 2026).

disadvantages.[267] One of the disadvantages is the systemic risk threat that exists due to the proliferation of alternative lenders and loan originators.[268] Leverage has a direct relationship with price, as the more capital is borrowed the more that is invested. The more a security is purchased, the higher its price gets. Therefore, leverage fuels price bubbles and price bubbles are a representation of systemic risk.[269] Hence, it is necessary to understand how access to leverage in financial markets has developed.

Forms of leverage can be segregated into two categories.[270] Firstly, an institution can approach a bank and borrow cash finance in the form of a loan or overdraft. A hedge fund can access this type of funding directly. This borrowing can be secured or unsecured and appears as leverage on the institution's balance sheet. This is known as financial or bank-based leverage. Secondly, an institution can access leverage using derivatives or a securities financing transaction such as a repo contract. Such trades are executed through a prime broker and are referred to as market-based leverage. On an increasing basis, prime brokers are executing leverage transactions on behalf of hedge funds in the repo market due to lower costs and regulatory oversight. Due to the transaction value being derived from an underlying asset, it is referred to as synthetic, and the full potential exposure of the position does not appear on the hedge fund's balance sheet. A market-based synthetic leverage model is steadily replacing the traditional bank-based financial leverage model as more market

[267] ECB, Financial Stability Review of May 2025, chapter 4; available at https://www.ecb.europa.eu/press/financial-stability-publications/fsr/html/ecb.fsr202505~0cde5244f6.en.html (date accessed: 4 January 2026).
[268] P. Dorin and M. Vojtko, 'The European Journey of Alternative Lenders: Towards a Capital Markets Union?' (2018) 33(11) *Journal of International Banking & Regulation* 385.
[269] M. Brunnermeier, S. Rother and I. Schnabel, 'Asset Price Bubbles and Systemic Risk' (2020) 33(9) *The Review of Financial Studies* 4272. Also, D. Awrey and K. Judge, 'Why Financial Regulation Keeps Falling Short' (2020) 61(7) *Boston College Law Review* 2303.
[270] J. Bats and A. Houben, 'Bank-Based versus Market-Based Financing: Implications for Systemic Risk' (2020) 144 *Journal of Banking and Finance* 1.

participants, such as hedge funds, turn to the derivative and repo markets for their funding requirements.[271]

The impact of this increased leverage level and evolving access of hedge funds to synthetic financing options is that portfolio position sizes and risk exposures are amplified by the same level as the leverage. Therefore, understanding the industry level and trend of hedge fund access to synthetic leverage is important. However, there are few publicly available leverage data sources concerning the hedge fund industry within the EU. For instance, ESMA collects information under mandatory disclosure regimes, such as the regime introduced pursuant to AIFMD.[272] ESMA also conducts annual surveys of the EU AIFs industry.[273]

According to ESMA's 2020 survey of the AIF industry, the average leverage of AIFs was 440 per cent, but the leverage of the hedge fund element ranged from 730 per cent to 1,050 per cent. Considering the outliers, the leverage range is up to 7,155 per cent. This means that portfolios, on average, have been as highly leveraged as 7 and 10 times post-global financial crisis. This leverage is predominantly synthetic, emanating from derivatives and repos rather than financial leverage from cash borrowing.[274] This synthetic leverage had been increasing

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[271] Bank of England, Financial Stability Report - December 2025; available at: https://www.bankofengland.co.uk/financial-stability-report/2025/december-2025 (date accessed: 4 January 2026). E. Eren and P. Wooldridge, Bank for International Settlements Paper No 119, Non-bank financial institutions and the functioning of government bond markets, November 2021; available at: https://www.bis.org/publ/bppdf/bispap119.pdf (date accessed: 4 January 2026) . Bank of England Speech given by Sir Jon Cunliffe, Deputy Governor Financial Stability, Member of the Monetary Policy Committee, Member of the Financial Policy Committee and Member of the Prudential Regulation Committee, 9 February 2017 at the Asset Management Derivatives Forum, Dana Point, California; available at: https://www.bis.org/review/r180221a.pdf (date accessed: 4 January 2026). A. Johnston, 'Regulating Hedge Funds for Systemic Stability: The EU's Approach' (2015) 21(6) *European Law Journal 762*.

[272] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, OJEU L 174, 1.7.2011.

[273] European Securities and Markets Authority, *ESMA Annual Statistical Report: EU Alternative Investment Funds 2020*; available at: https://www.esma.europa.eu/sites/default/files/library/esma50-165-1006_asr-aif_2020.pdf (date accessed: 4 January 2026).

[274] *Ibid*, 10.

year on year, which signifies that higher amplification levels were required to maintain or increase target hedge fund returns. However, since the 2020 survey, annual surveys by ESMA consistently indicate that these leverage numbers are trending downwards.[275]

It is evident that there is a significant synthetic leverage driver behind performance concerning EU-domiciled and managed hedge funds.[276] However, this also drives the effective size and reach of the industry through the increasing position exposure levels and counterparty connectedness. Therefore, leverage is a driver of portfolio risk and exposure. According to a 2020 ESMA report, sixty per cent of the leverage used by these EU-domiciled and managed hedge funds is accessed through repo and reverse repo trading.[277] The remainder is leveraged through derivatives and a minor amount of financial leverage through secured and unsecured cash borrowing.[278] Statistics show a year-on-year increasing inflow of subscriptions and higher leverage levels over the past two decades in the hedge fund industry.[279] Consequently, the hedge fund industry has grown by approximately 15.8 per cent in 2019, according to the most recent data available from the FSB (2020).[280] Such growth, fuelled by increasing levels of synthetic leverage, has the potential to magnify systemic risk. The FSB has not since published data on the growth of the hedge fund industry, but instead

[275] European Securities and Markets Authority, *ESMA Annual Statistical Report: EU Alternative Investment Funds 2022*; available at: https://www.esma.europa.eu/sites/default/files/library/esma50-165-1948_asr_aif_2022.pdf (date accessed: 4 January 2026). European Securities and Markets Authority, *ESMA Annual Statistical Report: EU Alternative Investment Funds 2023*; available at: https://www.esma.europa.eu/sites/default/files/2024-01/ESMA50-524821-3095_EU_Alternative_Investment_Funds_2023.pdf (date accessed: 4 January 2026).
[276] D. Fricke, 'Synthetic Leverage and Fund Risk-Taking' (2025) 154 *Journal of International Money and Finance* 1.
[277] ESMA, *supra* note 27, 21.
[278] *Ibid*., 50-51.
[279] A. Johnston, 'Regulating Hedge Funds for Systemic Stability: The EU's Approach' (2015) 21(6) *European Law Journal* 758, 762. Also, see Statista, 'Value of assets managed by hedge funds worldwide from 1997 to 2019'; available at: https://www.statista.com/statistics/271771/assets-of-the-hedge-funds-worldwide/ (date accessed: 4 January 2026).
[280] Financial Stability Board, 'Global Monitoring Report on Non-Bank Financial Intermediation 2020, 14; available at: https://www.fsb.org/wp-content/uploads/P161220.pdf (date accessed: 4 January 2026).

now focuses on data relating to the growth of the non-bank sector. This non-bank categorisation now includes hedge funds.

2.2.3. Synthetic leverage options

Funding investment activity from synthetic leverage is not *per se* a negative practice that automatically leads to systemic risk and value destruction. It uses the strength of the portfolio efficiently and reduces the cost of finance for a hedge fund. However, any form of leverage has the potential to become of systemic concern if the borrower becomes unable to service its debt obligations. When markets and security prices begin to fall, borrowers may experience illiquidity and potential debt default. Abuse of leverage can occur by exceeding average leverage ratios, by the concentration of return sources, by reliance on short-term funding sources for long-term investment return horizons, by a willingness to pay above-market rates for access to leverage, and by using illiquid assets to collateralise leverage.

The use of illiquid assets as collateral in the leverage transaction is at the centre of the concerns over market-based leverage options' contribution to systemic risk. This is because such finance is usually collateralised by securities that are subject to valuation changes. Synthetic, rather than financial leverage, arrangements are increasingly entered into through a revolving finance facility, leading to perpetual leverage requirements to maintain returns.[281] However, such leverage within a portfolio creates the risk of catastrophic losses, which has proven true in many historical financial crises.[282]

As indicated above, amongst hedge funds, market-based synthetic leverage has become the norm for financing portfolio trading. Derivatives and repos are the most commonly used

[281] O. Salah, 'Leveraged Finance: Recent Developments, Opportunities and Risks' (2019) 34(6) *Journal of International Banking Law and Regulation* 179-180.
[282] W. Ge, 'The Case for the Cautious Use of Leverage' (2017) 19(4) *The Journal of Wealth Management* 26.

forms of synthetic leverage. Therefore, this section will be divided into two further sub-sections to explain each form of leverage respectively.

2.2.3.1. Derivatives

Derivatives contracts traded by the hedge fund industry include options, futures, forwards and swaps.[283] An option is a contract that allows a hedge fund to purchase an entitlement to buy or sell securities at a predetermined strike price in the future. A forward is a non-standardised contract whereby two parties agree on the time and price of a purchase or sale of securities in the future. A future is a standardised forward contract offered by a clearing house where the security is bought and sold. A swap is a contract whereby two parties agree to swap the cash flow on pre-selected securities. These trades are referred to as derivatives because they derive their value from an underlying commodity, equity stock, fixed-income bond, interest rate or currency.[284]

As a specific form of derivative, a credit derivative enables a hedge fund to generate leverage. Such derivatives can be structured as funded credit derivatives, where a hedge fund assumes the credit risk and must make initial margin payments to secure against future credit events.[285] However, the two parties may also agree to structure the derivative in such a way

[283] Y. Hu, 'Exploring Hedge Fund Strategies in Portfolio Management Using Financial Derivatives and Their Impact on Market Volatility' (2023) 62(1) *Advances in Economics Management and Political Sciences* 69. Y. Chen, 'Derivatives Use and Risk Taking: Evidence from the Hedge Fund Industry' (2011) 46(4) *Journal of Financial and Quantitative Analysis* 1073.
[284] A. Carroll, F. O'Brien and J. Ryan, 'An Examination of European Firms' Derivatives Usage: The Importance of Model Selection' (2017) 23(4) *European Financial Management* 648. O. Kirillova and E. Emelyanova, 'Risk Management of Derivative Financial Instruments' (2021) 2021(1-2) *International Review (Faculty of Business Economics and Entrepreneurship)* 89. C. Zazzara, 'The New OTC Derivatives Landscape: (More) Transparency, Liquidity, and Electronic trading' (2019 21(2) *Journal of Banking Regulation* 170.
[285] For example a Credit-linked Note (CLN) or a Collateralised Debt Obligation (CDO). See L. Cordell, G. Feldberg, and D. Sass, 'The Role of ABS CDOs in the Financial Crisis' (2019) 25(2) *The Journal of Structured Finance* 10.

that they are each responsible for their own credit risk and payments under the contract. This is known as an unfunded credit derivative.[286]

The value of a credit derivative is backed by the credit risk of another firm or financial instrument. As part of this trade, the credit protection seller agrees to pay the credit protection buyer if a predetermined credit event occurs. A prime example of this is a Credit Default Swap (CDS), where a hedge fund may sell protection but not commit funds upfront to cover future obligations. In this way, the hedge fund uses the CDS as a form of leverage finance.[287] The money which is not committed can be used to fund further credit derivatives. In effect, credit derivatives can be used to fund additional credit derivative trading.[288] Increased leveraging in this manner results in increased portfolio risk and the connection of hedge funds to other financial institutions. The increased linkages create counterparty risk of institutional default. This exact systemic risk scenario materialised in the 2008 crisis, where a previously viewed microeconomic risk had significant macroeconomic impacts.[289] One institutional default acted as a credit event on all credit derivatives issued on that institution across the market and started a domino effect.[290]

The derivatives market is a mature market where many hedge funds have traditionally sought leveraged finance options. However, bilaterally negotiated derivative contracts off-exchange (known as over-the-counter or OTC derivatives) have now largely been brought on-exchange

[286] For example a Credit Default Swap (CDS). See N. Arora, P. Gandhi, and F. Longstaff, 'Counterparty credit risk and the credit default swap market' (2012) 103(2) *Journal of Financial Economics* 280.
[287] E. Gerding, 'Credit Derivatives, Leverage, and Financial Regulation's Missing Macroeconomic Dimension' (2011) 8 *Berkeley Business Law Journal* 31.
[288] *Ibid*., 41.
[289] *Ibid*., 31-32. The subsequent regulation of credit derivatives is arguably a factor in why hedge funds have migrated away from seeking leverage in the derivatives market to leveraging through repos. EU repo trades are predominantly bilateral between the lender and the borrower or security owner. However, the repo market in the US operates a tri-partite structure whereby a clearing bank sits between the lender and borrower to facilitate administrative and settlement efficiency.
[290] J. Kress, 'Credit Default Swaps, Clearinghouses, and Systemic Risk: Why Centralized Counterparties Must Have Access to Central Bank Liquidity' (2011) 48 *Harvard Journal on Legislation* 58.

(known as exchange-traded derivatives or ETDs) and regulated under the European Market Infrastructure Regulation (EMIR).[291] Therefore, the hedge fund industry has migrated to seeking leverage finance in the repo market, where the same levels of transparency and central clearing requirements do not exist.

One interesting point to note is that, prior to 2008, it was common for CDS traded in the derivatives markets to be taken and then posted by hedge funds in the repo market as collateral for further leverage. These trades were referred to as HedgeRepos. However, post-2008, this highly risky practice has disappeared as increasingly repo markets require the highest grade government bonds to be posted as collateral.[292] The current practice in repo markets will be outlined in the following sub-section.

2.2.3.2. Repos

The traditional bank-based model of financing has slowly been replaced by a new model of synthetic financing through repos. The same 'size, liquidity, maturity, and credit transformations' that existed in the bank-based model have now emerged in the market-based model.[293] A repo is a market-based securities financing transaction whereby a hedge fund gains access to leverage by pledging collateral in the form of portfolio securities,[294] with an accompanying obligation to repurchase the pledged securities at an agreed future date.[295]

[291] 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, [2012] OJ L201/1.
[292] For an overview of CDS and HedgeRepos see K. Kakumanu, I. Nelken and M. Choudhry, 'The "HedgeRepo" concept: using Credit Derivatives as Repo Collateral' (2005) 11 *Derivatives Use, Trading & Regulation* 37. An unintended consequence of the repo market requiring the use of government bonds as collateral is that the hedge fund industry has now become one of the biggest participants in the US Treasury market.
[293] H. McVea, 'Targeting hedge funds and 'repo runs' in I. Chiu and G. MacNeil (eds.) *Research Handbook on Shadow Banking*, 186-187 (Cheltenham: Edward Elgar Publishing, 2018).
[294] H. Nabilou, 'Repo Markets Across the Atlantic: Similar but Unalike' (2018) 30(4) *European Business Law Review* 517-518. Nabilou highlights the difference between US and EU repo markets. In the EU, the collateral is sold to the lender and economic ownership is retained by the borrower. In the US, transferring only legal title to the lender is difficult so the collateral is simply pledged to allow the borrower to retain economic ownership.
[295] D. Gabor, 'The (Impossible) Repo Trinity: The Political Economy of Repo Markets' (2016) 23(6) *Review of International Political Economy* 968.

A significant risk that exists in the pledging of collateral is that the industry-wide pledging of risky or illiquid portfolio securities as collateral has the potential to transform portfolio risk into systemic risk. Hence, pledged collateral can be of two kinds. Firstly, there is general collateral, which means any form of security will be accepted as security. Secondly, there is specific collateral, which means only specified financial instruments will be accepted as security. Such specific collateral is usually a government bond because of its near risk-free status in potential default. Over two-thirds of the repo market is collateralised based on government debt because of its near risk-free status as a form of collateral.[296]

In return for selling legal title to its collateral, a hedge fund will be given a borrowing facility for a certain period of time. At the end of this period, the hedge fund must contractually repurchase the collateral. This is why the transaction is called a repo. At all times, the hedge fund remains the economic owner of the collateral, thereby still receiving all coupon or dividend payments. It is for this reason of retained ownership that hedge funds prefer this form of financing.[297] From a lender's perspective, a repo is a short-term collateralised loan that is often used to fund longer-term investment strategies by being rolled over on maturity. In this way, a repo plays a role in maturity transformation, much like a loan on deposited funds in a traditional bank.

As part of the repo, the parties involved agree on the interest rate, the maturity and a 'haircut.' The interest rate is the cost of the leverage arrangement. The maturity is the length of time the facility is extended before it must be repaid or rolled over. The haircut is the percentage difference between the value of the pledged collateral and the size of the loan. The way a repo transaction is priced is different to how equity is priced. The difference between

[296] *Ibid*., 969.
[297] *Ibid*., 972.

the sale price of the securities used as collateral and their repurchase price is referred to as the 'repo rate.' The repo rate, or the relationship between the repo price and the collateral posted against the repo, can be a source of portfolio risk. Any widening spread between the price of the underlying collateral and the repo price can place stress on the repo price and alter the portfolio risk profile of a hedge fund.[298] When such widening occurs, repo lenders can retract from the market, leaving repos subject to runs in a similar way that bank deposits are subject to runs. Such a market event is known as a 'repo run' and demonstrates how prevalent market-wide leveraging creates portfolio risk with potentially systemic implications.[299]

Therefore, the quality of the collateral posted is at the core of how a repo is priced and the possibility of a repo run.[300] This is why the lender usually requires over-collateralisation of the repo cash value in the form of a haircut. The lender may call for an additional margin if the market value of the posted collateral begins to fall.

2.2.4. Hedge fund portfolio risk modelling approaches

Portfolio risk management is the practice of a hedge fund measuring individually and collectively the risk potential of its portfolio positions. Individual measurement assesses the specific risk each position contributes on its own, while collective measurement evaluates how all positions interact to shape the overall portfolio risk. This interaction can be through

[298] C. Boissel, F. Derrien, E. Ors and D. Thesmar, 'Systemic Risk in Clearing Houses: Evidence from the European Repo Market' (2017) 125(3) *Journal of Financial Economics* 511.
[299] P. Saguato, 'The Liquidity Dilemma and the Repo Market: A Two-Step Policy Option to Address the Regulatory Void' (2017) 22(1) *Stanford Journal of Law, Business & Finance* 91.
[300] H. McVea, 'Restoring Regulatory Credibility and Preventing 'Repo Runs': A Cautionary Tale' (2019) 30 *European Business Law Review* 9.

correlations, concentrations, and diversification. This risk profile is influenced by the type and level of leverage that the portfolio employs. The most common way to measure portfolio risk is through data-driven statistical models. At the outset, it is worth mentioning that every statistical model has limitations in explaining or combatting risk. However, despite their limitations, these are the only predictors of risk that the industry has to rely on.[301] A popular methodology used is vector autoregression (VAR), which is the statistical mapping of the relationship between multiple related risk factors over time. Examples of commonly used VAR models include marginal expected shortfall (MES), systemic expected shortfall (SES), systemic risk (SRISK), conditional value-at-risk (CoVaR) and value-at-risk (VaR). MES, SES, SRISK and CoVaR are methods used by regulators and organisations with access to market-wide data, such as the ESRB.[302] These methodologies will be addressed in Part 2.3 of the chapter. VaR is a methodology used by hedge funds to measure the value at risk of each position within their portfolio. VAR is a methodology for measuring the relationship between variables and results in the condensing of that relationship into a single number. The importance of such calculations is linked to the possibility that micro-level exposures can be aggregated to assess macro-level risks within the industry. [303]

VaR measures the value-at-risk of a portfolio and is the most widely used risk metric within the hedge fund industry to determine a portfolio's risk exposure.[304] This model assesses risk

[301] R. Ferland and S. Lalancette, 'Portfolio Choices and Hedge Funds: A Disappointment Aversion Analysis' (2021) 27(7) *The European Journal of Finance* 679. D. Allen and E. Luciano, 'Risk Analysis and Portfolio Modelling' (2019) 12(4) *Journal of Risk and Financial Management* 154.
[302] C. Brownless and R. Engle, 'SRISK: a conditional capital shortfall measure of systemic risk' ESRB Working Paper No 37, March 2017; available at: https://www.esrb.europa.eu/pub/pdf/wp/esrbwp37.en.pdf (date accessed: 4 January 2026). M. Wosser, 'What Drives Systemic Bank Risk in Europe' Central Bank of Ireland Research Technical Paper, October 2017; available at: https://www.centralbank.ie/docs/default-source/publications/research-technical-papers/08rt17---what-drives-systemic-bank-risk-in-europe.pdf (date accessed: 4 January 2026).
[303] E. Lin, E. Sun and M. Yu, 'Systemic Risk, Financial Markets, and Performance of Financial Institutions' (2018) 262 *Annals of Operatiosn Research* 579.
[304] S. Benoit, J. Colliard, C. Hurlin and C. Pérignon, 'Where the Risks Lie: A Survey on Systemic Risk' (2017) 21(1) *Review of Finance* 109.

under historical volatility thresholds in order to determine the impact of the portfolio risk profile on the unrealised profit or loss of the portfolio. Such metrics are based on predetermined minimum and maximum exposure limits. The VaR is measured at different confidence intervals and at different times to assess the certainty of potential unrealised profit or loss if historical volatility levels were to reoccur.[305] Through leverage, the size of each position is magnified and hence, also, its impact from a VaR perspective. Therefore, it is arguable that as leverage levels increase within a portfolio, VaR becomes a proxy for leverage risk.[306] Thus, as leverage levels increase within a portfolio, the leverage and portfolio risks converge. This makes it a relevant risk calculation in connection with systemic risk because the leverage risk and portfolio risk, in essence, become the same.

Measuring risk is not without limitations. The VaR model is a statistical model based on a confidence level and an assumption of the 'normal' distribution of asset returns. However, the parameters underpinning the VaR model are inherently less objective, as the parameters rely on assumptions reflecting expected returns under typical market conditions. Moreover, the measure is temporal in nature, providing only a snapshot of potential losses at a specific point in time rather than a consistent assessment of risk across changing market environments. Therefore, it is the best guess based on historical volatility levels and the predictability of investment behaviours. The limitation is that investments do not act in predictable ways. Historical volatility is not a good predictor of future volatility. Only statisticians can operate and understand the output of the model, a reason why most market participants did not predict the 2008 financial crisis.[307] The Bank of England has also been critical of the

[305] R. Kellner and D. Rösch, 'Quantifying Market Risk with Value-at-Risk or Expected Shortfall? – Consequences for Capital Requirements and Model Risk' (2016) 68 *Journal of Economic Dynamics and* Control 45.
[306] J. Gordon and E. Wai Kuen Tse, 'VaR: A Tool to Measure Leverage Risk' (2003) 29(5) *The Journal of Portfolio Management* 65.
[307] R. Sollis, 'Value at Risk: A Critical Overview' (2009) 17(4) *Journal of Financial Regulation and Compliance* 398.

assumptions made by VAR models in mapping the relationships between variables.[308] In its later 2015 working paper, the Bank of England stated that 'a key consideration … is whether the model's purpose is simply to estimate some percentile of the return distribution, or whether its aims are broader.'[309] The working paper further noted that such VAR models are pro-cyclical. This means that the models may underestimate risk in calm periods and overestimate risk in stressed ones. The effect is an amplification of systemic risk.[310] Therefore, these limitations of VAR models contribute to the wider arguments of this thesis and its connection to systemic risk. Quantitative risk-models can encapsulate a false sense of security, obscure structural vulnerabilities, and impede the ability of market participants and regulators to anticipate market shifts.

2.3. The origin of systemic risk concerns of leveraged hedge funds

This part of the chapter explores systemic risk origins by seeking to outline the practices of hedge funds and how these practices can contribute to systemic risk concerns. Systemic risk can originate in products, markets or participants. It can also originate in trading activities or be triggered by events such as insolvency or bankruptcy. The hedge fund industry is evaluated for systemic relevance on two levels. At the collective level, regulators assess the industry as a whole to determine whether hedge funds, in the aggregate, pose a significant risk to the financial stability of the market. Separately, at the individual level, hedge funds are assessed to determine if their size, leverage, interconnectedness, or activities make them systemically important on their own. Typically, macroprudential authorities, such as central

[308] S. Miranda-Agrippino and G. Ricco, 'Bayesian vector autoregressions' (2018) Bank of England Staff Working Paper No. 756; available at: https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2018/bayesian-vector-autoregressions.pdf (date accessed: 4 January 2026).
[309] P. Gurrola-Perez and D. Murphy, Bank of England Working Paper No. 525: Filtered historical simulation Value-at-Risk models and their competitors, March 2015, i.
[310] *Ibid*.

banks or financial stability boards, conduct the industry-wide assessment. Microprudential regulators, such as national financial regulators or supervisory authorities, such as Central Banks, evaluate the systemic importance of individual hedge funds. Together, the assessments capture the origins of systemic risk both across the industry and within individual institutions. This allows for a comprehensive understanding of potential threats to financial stability.

This part will be divided into five sections. Firstly, it will consider the complexity of theoretical models that define the concept of systemic risk. Secondly, it will identify the phases of systemic risk. Thirdly, it will evaluate how interconnectedness is central to the systemic risk of leveraged hedge funds.[311] Fourthly, an analysis will be undertaken of the Systemically Important Financial Institution (SIFI) methodology, which is how regulators determine which market participants represent the most significant systemic risk within financial markets. Fifthly, an assessment of hedge funds' risk-intensive practices will be undertaken to demonstrate how hedge funds contribute to potential systemic risk.

2.3.1. *Defining systemic risk*

In academic literature, systemic risk can be viewed as 'the potential threat entailing a situation when individually rational responses of economic agents to emerging risks do not result in better risk diversification.'[312] This risk results from either structural specificities within the financial system that facilitate systemic risk transmission or economic incentives

[311] T. Roncalli and G. Weisang, 'Asset Management and Systemic Risk' Working Paper 26 May 2015, 1. S. Schwarcz, 'Systematic Regulation of Systemic Risk' (2019) 1 *Wisconsin Law Review* 1. S. Benoit, J. Colliard, C. Hurlin and C. Pérignon, 'Where the Risks Lie: A Survey on Systemic Risk' (2017) 21 *Review of Finance* 109.

[312] A. Mansurov, 'Role of Systemic Risk in the Formation, Transmission, and Exacerbation of Economic Instability' (2013) 24(4) *Studies on Russian Economic Development* 366. For additional definitions of systemic risk see S. Ellis, S. Sharma, and J. Brzeszczyński, 'Systemic Risk Measures and Regulatory Challenges (2022) 61(c) *Journal of Financial Stability* 1. P. Smaga, 'The Concept of Systemic Risk' (2014) SRC Special Paper No. 5, 1.

that encourage participant behaviours that accumulate into a systemic threat.[313] Underpinning the transmission of systemic risk is the liberalisation of financial markets and their accompanying global interconnectedness.[314] This liberalisation and globalisation creates vast amounts of information for market participants to access. However, information asymmetry within the market abounds with the constant incentive for market participants to exploit those informational differences through increased risk-taking. This results in the potential accumulation of systemic risk.[315]

From a practitioner perspective, the Financial Stability Board (FSB) guidance in 2009 described systemic risk as:

> 'a risk of disruption to financial services that is (i) caused by an impairment of all or parts of the financial system and (ii) has the potential to have serious negative consequences for the real economy. Fundamental to the definition is the notion of negative externalities from a disruption or failure in a financial institution, market or instrument. All types of financial intermediaries, markets and infrastructure can potentially be systemically important to some degree.'[316]

The FSB further explains the three criteria that must be considered to assess if a market or institution represents a systemic risk. The criteria are size, suitability, and

[313] T. Silva, M. Alexandre and B. Tabak, 'Bank Lending and Systemic Risk: A Financial-Real Sector Network Approach with Feedback' (2018) 38 *Journal of Financial Stability* 98. M. Kranke and D. Yarrow, 'The Global Governance of Systemic Risk: How Measurement Practices Tame Macroprudential Politics' (2019) 24(6) *New Political Economy* 816.
[314] M. Hamdaoui, 'Liberalization, Regulatory Delays and Vulnerability to Systemic Banking Crisis' (2017) 31(4) *International Economic Journal* 490
[315] Mansurov, *supra* note 66, 369.
[316] Financial Stability Board, *Guidance to Assess the Systemic Importance of Financial Institutions, Markets and Instruments: Initial Considerations Report to the G-20 Finance Ministers and Central Bank Governors,* October 2009, 2-3; available at: https://www.fsb.org/wp-content/uploads/r_091107c.pdf (date accessed: 4 January 2026). The most significant change to this view of systemic risk has been the developments by the FSB to define and categorise non-bank financial institutions.

interconnectedness.[317] Size refers to the volume of a particular component of the financial system. Suitability refers to whether or not other components within the financial system can provide the same service in a market failure. Interconnectedness refers to linkages between different components in the financial system. In this respect, components should be interpreted as sectors.

It is also important to distinguish between 'systemic risk', 'idiosyncratic risk', and 'term-specific risk'. Systemic risk refers to the risk that distress in one or more components of the financial system may trigger widespread disruption or collapse of the system as a whole, whereas idiosyncratic risk concerns the failure of an individual institution without necessarily threatening overall financial stability. Term-specific risk, by contrast, arises from the duration of a financial contract, with longer maturities increasing exposure to changes in market, funding, or collateral conditions over time, potentially amplifying both idiosyncratic and systemic vulnerabilities.[318]

Despite many views, it is acknowledged by the FSB that 'there is no consensus regarding the concept of financial stability and systemic risk.'[319] Systemic risk is primarily viewed as an indirect risk and hence challenging to define conclusively.[320] However, a commonly accepted stance is that systemic risk is 'hard-to-define-but-you-know-when-you-see-it.'[321] There is diversity and complexity associated with the potential sources of systemic risk and with how systemic risk materialises. This is mirrored by a diversity of academic perspectives on

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[317] *Ibid.*
[318] Roncalli and Weisang, *supra* note 65. Many single entities may simultaneously experience the same idiosyncratic risks. However, this "common risk factor" is independent of the idiosyncratic risk itself. Nevertheless, it evidences a connection between idiosyncratic and systemic risk. It also explains why prudential rules are introduced at the entity level to protect against destabilisation at the system level, particularly in large global financial institutions such as banks or insurers. An example of this relationship is the Basel III reform which increased capital buffers that banks were required to hold to limit common factors on systemic risk. Macroprudential reforms are instituted through microprudential rule changes.
[319] *Ibid*., 2.
[320] *Ibid*.
[321] Benoit et al, *supra* note 58, 109.

systemic risk.[322] Regardless of how it is to be defined, it is challenging to spot systemic risk *ex ante* a significant financial institution or market collapse.[323] The task has been made more difficult by a divergent and complex landscape concerning the regulation of systemic risk.[324]

Systemic risk theories and measurement tools operate at macro and micro levels. At the macro-level, systemic risk is viewed cross-sectorally. Macro-systemic risk concerns the accumulation of correlated risk across the market. Externalities of concern can include the simultaneous increase in credit and liquidity exposures, incentives to take even greater risks, information asymmetry, and, in the worst case, the triggering of a fire sale of assets to maintain liquidity during a crisis.[325] Tools such as interest rates can be used by macro regulators, such as Central Banks, to incentivise capital flows between the banking system and the securities market. This can be primarily achieved by contracting risk bubbles that threaten the stability of the entire market if they burst.[326] Although liquidity in the market is viewed positively from a market efficiency perspective, its creation is most often due to the practice of leveraging. This leveraging to fund investing is the driver behind systemic risk bubbles.[327]

Micro-systemic risk concerns the failure of a single institution, which has a negative impact on the entire financial system through externalities. Regulators can combat this risk by

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[322] O. Renn, M. Laubichler, K. Lucas, W. Kröger, J. Schanze, R. Scholz, and P. Schweizer, 'Systemic Risks from Different Perspectives' [2020] *Risk Analysis: An International Journal* 1. C. Buch, T. Krause, and L. Tonzer, 'Drivers of Systemic Risk: Do National and European Perspectives Differ?' (2019) 91 *Journal of International Money and Finance* 160. G. Tedeschi, F. Caccioli, and M. Recchioni, 'Taming Financial Systemic Risk: Models, Instruments and Early Warning Indicators' (2019) 15(1) *Journal of Economic Interaction and Coordination* 1.
[323] J. Gray, 'What is systemic risk and what can be done about it? A legal perspective' (2011) *EUI Working Papers* 2.
[324] The regulation of corporate behaviour, the securitization processes and rating agencies, risk through central counterparty (CCP) clearing, individual firms that are systemically important, and the introduction of a systemic index all focus on combatting systemic risk from a different perspective.
[325] P. Smaga, 'The Concept of Systemic Risk' (2014) *SRC Special Paper No. 5,* 6-7.
[326] S. Schwarcz, 'Systematic Regulation of Systemic Risk' (2019) 1 *Wisconsin Law Review* 1.
[327] V. Acharya and A. Thakor, 'The Dark Side of Liquidity Creation: Leverage and Systemic Risk' (2016) 28 *Journal of Financial Intermediation* 4.

focusing on the incentives behind risk-taking by regulating, *inter alia,* corporate governance through capital requirements and remuneration rules. At the micro-level, individual firms can be identified and measured as being systemically important.[328] However, due to their size and activity within financial markets, certain institutions can be seen as *too-big-to-fail* (TBTF).[329] TBTF describes a situation where letting a systemically important institution collapse would have a greater cost to the financial system and the economy than a government bailout.[330] However, this reasoning could be criticised for acting as an incentive for excessive institutional risk-taking and the wrongful bailouts of collapsing institutions.[331] It is debatable whether TBTF categorisations and reactive measures are ever likely to apply to a hedge fund which is a fraction of the size of a bank and made up of institutional funding. By their very nature as institutional products, hedge funds tend to operate outside of the usual retail considerations for intervening to 'rescue' systemic financial institutions.

2.3.2. Identifying systemic risk phases

Leverage is closely linked to liquidity in the market and the bubbles that create systemic risk. However, leverage does not cause systemic risk in and of itself. Instead, it amplifies the portfolio risk inherent in hedge funds to the point that such exposures cannot be sustained and become systemic when markets decline. In order to understand the extent to which leveraged

[328] D. Bholat and J. Gray, 'Organizational Form as a Source of Systemic Risk' (2013) 7 *Economics* 1.
[329] Financial Stability Board, 'Evaluation of the Effects of Too-Big-To-Fail Reforms: Final Report' 1 April 2021, available at: https://www.fsb.org/wp-content/uploads/P010421-1.pdf (date accessed: 4 January 2026). M. Hellwig, 'Twelve Years after the Financial Crisis – Too-big-to-fail is still with us' (2021) 7 *Journal of Financial Regulation* 175. J. Barth and C. Wihlborg, 'Too Big to Fail: Measures, Remedies, and Consequences for Efficiency and Stability' (2017) 26 *Financial Markets, Institutions & Instruments* 175. L. Quaglia and A. Spendzharova, 'The Conundrum of Solving 'Too Big to Fail' in the European Union: Supranationalization at Different Speeds' (2017) 55 *Journal of Common Market Studies* 1110.
[330] S. Omarova, 'The "Too Big to Fail" Problem' (2019) 103(6) *Minnesota Law Review* 2495.
[331] *Ibid.*, 2497. E. Nier, 'Financial Stability Frameworks and the Role of Central Banks: Lessons from the Crisis' (2009) *IMF Working Paper WP/09/70* 24.

hedge funds potentially represent a systemic risk, it is beneficial to elucidate the phases in a systemic risk cycle.

Systemic risk comprises three interlinked concepts. Firstly, systemic risk-taking can arise from market participants engaging in similar trading patterns in size and correlation. Individually, these market participants' trading patterns have no systemic impact. However, together, they have systemic potential. This leads to, *inter alia,* correlation risk, liquidity risk, and leverage bubbles.[332]

Secondly, a spillover of losses from one sector to another within financial markets can result from a significant institutional collapse. Such collapses can be due to liquidity shortages, which leverage practices can exacerbate. Multiple smaller exogenous or endogenous market shocks related to leverage trading can also spill over into contagion channels. This contagion can put significant pressure on all connected institutions, some of which will fit into the category of being too-big-to-fail. Systemic risk results if the shock, contagion, and institutional failure sequence becomes cyclical. Such a cycle can develop during a structurally vulnerable period, such as a market downturn.[333] This may be termed the contagion effect. This concept will be further discussed in section 2.3.4 in relation to interconnectedness.

Thirdly, a market participant's accumulation of failed leveraged trading positions can represent small market shocks, causing a potential systemic impact. This may be described as an amplification leading to an eventual materialisation of systemic risk. This amplification can lead to a liquidity crisis in a market downturn, ultimately creating a market paralysis or

[332] Benoit *et al*, s*upra* note 58, 117-119.
[333] Smaga, *supra* note 79, 16.

freeze. This is a natural progression of a run by depositors, known as a 'bank-run.' A run by investors in debt markets is called a 'repo-run.'[334]

The overlap and relationship between these three concepts allow potential phases or stages in the systemic risk process to be identified. These phases can develop into a sequence of events that become cyclical under certain stressed market conditions.[335] The phases identified by this chapter include (1) individual risk-taking or transmission through leveraged trades, made systemic by advertent or inadvertent herding; (2) accumulation of systemic risk at the micro-level through the leveraging and concentration of risky positions, or at the macro-level through constant small shocks within the financial market; (3) materialisation through a global institutional failure, most commonly seen as a result of liquidity failure, and the concept of too-big-to-fail; (4) spillover of systemic risk into contagion channels causing cross-sectoral and cross-border impact; and (5) structural vulnerability within the financial system that facilitates systemic risk transmission and materialisation.

Within these five phases, it has been proposed that there are, in turn, six potential origins of systemic risk which exist across these phases.[336] These origins of systemic risk include asset price bubbles, mispricing of assets, market panics, contagion, sovereign defaults, and currency mismatch within the banking sector. Systemic risk can be viewed with a 'horizontal' focus on the sector itself or a 'vertical' focus on the strength of a systemic event within that sector, such as a bank failure. In addition to systemic risk origins and phases, consideration needs to be given to the concept of magnitude.[337] This issue of magnitude is at the core of

[334] Benoit *et al, supra* note 58, 121-123. Also, see 2.2.3.2.
[335] Smaga, *supra* note 79, 1.
[336] See F. Allen and E. Carletti, 'Systemic Risk and Macroprudential Regulation', in F. Allen, M. Aoki, J. Fitoussi, N. Kiyotaki, R. Gordon and J. Stiglitz (eds.), *The Global Macro Economy and Finance* (London: Palgrave Macmillan, 2012).
[337] O. De Brandt and P. Hartmann, 'Systemic risk: A survey' (2000) *ECB Working Paper No 35* 13.

analysis concerning systemically relevant financial institutions. This magnitude of risk can be measured through industry risk modelling techniques, as discussed in the next section.

2.3.3. Measuring systemic risk

Only regulators and oversight bodies such as the ESRB have the mandate to measure systemic risk across the market. This is because these bodies have data access to a system-wide view.[338] Individual hedge funds only focus on the risk that each security position represents to the portfolio that the hedge funds are managing. Therefore, regulators and oversight bodies must analyse risk within the system using aggregation models. Hedge funds analyse risk within their portfolios without aggregating it with other hedge funds' data. Systemic risk can potentially arise from the individual activities or failure of a large hedge fund or from the aggregated activities or failure of a group of smaller market hedge funds. Only a regulator or oversight body will be looking for signs of such events and their impact on the market.

As identified in 2.2.4., CoVaR, MES, SES and SRISK are methods used by regulators and oversight bodies to determine expected capital shortfall within an individual market participant and compare that to the market to rank systemically risky institutions.[339] However, not all risk measurement approaches are universally accepted in translating individual exposure into system-wide risk. On the one hand, the diversification of risk amongst many individual counterparties reduces systemic potential. However, on the other hand, networks can create additional channels for transmitting systemic shock waves.[340] Research provides

[338] M. Wosser, 'What Drives Systemic Bank Risk in Europe' Central Bank of Ireland Research Technical Paper, October 2017; available at: https://www.centralbank.ie/docs/default-source/publications/research-technical-papers/08rt17---what-drives-systemic-bank-risk-in-europe.pdf (date accessed: 4 January 2026).

[339] C. Brownlees, 'SRISK: A Conditional Capital Shortfall Measure of Systemic Risk' (2017) 30 *The Review of Financial Studies* 49.

[340] J. Bricco and T. Xu, 'Interconnectedness and Contagion Analysis: A Practical Framework' (2019) IMF Working Paper WP/19/220, 8; available at:

mixed evidence on the link between exposure data and the network characteristics that drive systemic risk.[341] The measurement of systemic risk in the market is not an exact science. Risk operates at different levels and dimensions within financial markets, such as leverage risk, counterparty risk, credit risk, and liquidity risk.

It is important to note that the relationship between firms' micro-level risk frameworks and the macro-level assessment of burgeoning systemic risk is symbiotic. Risk exposures identified and measured at the firm level can be used, and, indeed, are necessary in their aggregated form to determine a firm's distance from the average risk exposure level within a sample set of firms. Therefore, the purpose of micro and macro-level statistical modelling is connected. Both forms of modelling seek to measure the interconnectedness, relationship, and exposure between a single entity and system-wide risk.[342]

In order to fully address the potential systemic risk associated with high-risk hedge fund practices, a certain level of risk measurement must be undertaken. This measurement serves as a tool for identifying and validating the origin of potential systemic risk. From a macro-level, risks and exposures can also be viewed from mathematical measurements.[343] It is often possible to determine risk exposure at a macro-level simply by aggregating the same risks and exposures at a micro-level.[344] The systemic risk of the entire market is built upon

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https://www.imf.org/en/Publications/WP/Issues/2019/10/11/Interconnectedness-and-Contagion-Analysis-A-Practical-Framework-48717 (date accessed: 4 January 2026).

[341] S. Erol and R. Vohra, 'Network Formation and Systemic Risk' (2022) 148 *European Economic Review* 1.

[342] J. Bricco and T. Xu, 'Interconnectedness and Contagion Analysis: A Practical Framework' (2019) IMF Working Paper WP/19/220, 7; available at: https://www.imf.org/en/Publications/WP/Issues/2019/10/11/Interconnectedness-and-Contagion-Analysis-A-Practical-Framework-48717 (date accessed: 4 January 2026).

[343] Benoit *et al*, *supra* note 58, 110-113.

[344] *Ibid*., 133-136. See also, J. Wang, Y. Hsu, J. Lee and C. Chen, 'Measuring Systemic Risk: Capital Shortfall and CSRISK' (2021) 21(1) *International Review of Finance* 358. H. Dastkhan, 'Network-Based Early Warning System to Predict Financial Crisis' (2021) 26(1) *International Journal of Finance and Economics* 594. C. Zeldea, 'Systemic Risk: An Overview' (2019) 23(3) *Financial Studies* 34.

the VaR of each of the securities within the market.[345] It is also worth noting that, given the limits of the VaR model, this could be a flawed approach to measurement. The change in value-at-risk (CoVaR) can be used as a measure of any burgeoning systemic risk. This model measures the extent to which factors such as leverage or size can contribute to systemic risk. The change in the VaR within an institution is compared to the change in the VaR within the market to determine the expansion or contraction of systemic risk.[346] Hence, individual market participant changes are aggregated to reflect the change in the system-wide assessment.

Also, in addition to portfolio risk influences on systemic risk, a regulator can assess systemic risk emanating from the under-capitalisation of market participants. MES measures an institution's potential equity loss if the market as a whole falls beneath a predetermined threshold over a set timeframe. However, an extended version of this is SES, which measures an institution's under-capitalisation *vis-à-vis* the under-capitalisation of the market as a whole.[347]

Mathematically, these models can be used to determine the impact a hedge fund has on the market's systemic risk. For example, when the VaR of a hedge fund and that of the industry is undertaken, two coefficient estimates are produced: one for an individual participant and one for a sector-wide distribution. These two outcomes represent proxies for systemic risk.[348] These risk assessment results show that hedge funds can be determined as 'sectoral relevant' or 'sectoral vulnerable.' The former drives risk away from the sector equilibrium, and the

[345] T. Roncalli and G. Weisang, 'Asset Management and Systemic Risk' Working Paper 26 May 2015, 4.
[346] F. Hespeler and G. Loiaccono, 'Monitoring Systemic Risk in the Hedge Fund Sector' (2017) 17(12) *Quantitative Finance* 1862.
[347] Acharya and Thakor, *supra* note 81, 2.
[348] See 2.2.4.

latter restores it. The former creates systemic risk, and the latter absorbs it.[349] Therefore, a relationship exists between the risk profile of an individual hedge fund portfolio and the cumulative systemic risk sector-wide. However, that relationship is only known after the micro-level assessment and macro-level aggregation have taken place. A hedge fund can either add to the systemic impact of the sector or reduce it.

SRISK is designed to be an early warning signal in relation to systemic risk materialisation. It is meant to be a forward-looking market-based measurement that combines balance sheet data with market data. An institution with the largest SRISK contributes the highest level of under-capitalisation within the market. Capitalisation, net worth, asset values, leverage and liability values are all factors taken into account in the SRISK. However, the trigger in an SRISK assessment is a sustained market decline, or, in other words, the phase immediately preceding a crash.[350] SRISK looks at data that evidences the build-up of macro-financial imbalances, the development of procyclicality or boom and bust trends, and the linkage between financial markets and the real economy. However, it can only rely on past data to make assessments. Whatever forward-looking quality an SRISK may have to predict outcomes, it is almost certainly too late to warn of systemic risk when the market has already undergone a prolonged and steep decline. Therefore, this regulatory method of collectively measuring systemic risk across all market participants has a *time* defect. It is analogous to driving a car forward by looking in the rearview mirror.

The difficulty with the above metrics to predict systemic risk and its origins is that 'systemic risk measures should be demonstrably associated with real macroeconomic outcomes if they

[349] Hespeler and Loiaccono, *supra* note 100, 1859.
[350] C. Brownlees and R. Engle, 'SRISK: A Conditional Capital Shortfall Measure of Systemic Risk' (2017) 30(1) *Review of Financial Studies* 48.

are to be relied upon for regulation and policy decisions.'[351] However, systemic risk can be challenging to assess. In almost all cases, systemic risk cannot be identified until it has already materialised. The concept of a systemic risk proxy can assist in the assessment of burgeoning systemic risk. Systemic risk proxies are market factors that serve as a warning signal that systemic risk could be growing within the financial market or economy. Furthermore, mathematical models which evidence these proxy signals are increasingly being used by regulators when definitions of systemic risk remain vague.[352]

The same limitation that exists in relation to the VaR model operated within a hedge fund also exists in relation to systemic risk models operated by regulators.[353] ECB research has acknowledged that the flaw of the MES model is that it may not be able to help avert a disaster in financial markets. This is because measuring exposures to systemic risk within the confines of model assumptions allows only indicative inferences rather than definitive conclusions to be made. It is not a predictor of default. Therefore, MES may not be of any practical value in macroprudential analysis and regulation to prevent systemic risk.[354]

2.3.4. The role of interconnectedness in the systemic risk of hedge funds

[351] S. Giglio, B. Kelly and S. Pruitt, 'Systemic Risk and the Macroeconomy: An Empirical Evaluation' (2016) 119 *Journal of Financial Economics* 470.
[352] *Ibid*., 457-470. An example of how proxy signals are used is for an economic crisis which develops over time and which would be represented as a bell-shaped curve. Systemic risk can be addressed from the perspective of the core of the bell and the peripheral tails. Many factors need to be taken into account as possible proxies including institutions at risk of collapse, the comovement of institutional data sets and the possibility for contagion, the volatility of market securities, and the changing liquidity or credit levels within financial markets. However, volatility within financial markets is the best trigger, indicator or proxy for future systemic risk.
[353] See 2.2.4.
[354] J. Idier, G. Lamé and J. Mésonnier, 'How useful is the marginal expected shortfall for the measurement of systemic exposure? A practical assessment' (2013) ECB Working Paper Series No. 1546; available at: https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1546.pdf (date accessed: 4 January 2026).

Concerning its impact on systemic risk, interconnectedness within financial markets has been the subject of much investigation over the past 40 years.[355] Systemic risk has been cited as the risk of interconnectedness through market participants and trading counterparties buying or selling complex financial products.[356] However, before the Financial Stability Board (FSB) incorporated this term into its definition of systemic risk, interconnectedness had been referred to in other ways. It has previously been referred to as interdependency[357] or complementarity.[358]

Rather than solely viewing the market as the interaction of institutions, markets represent functions and behaviours.[359] The complexity of these interactions and behaviours within the financial system is evident in such activities as leveraging, securitisation, and OTC derivative products.[360] Interconnectedness is more than just a factual analysis of the numerical relationship between intermediaries. It is about understanding behavioural patterns and how they manifest.[361]

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[355] For example, O. Williamson, *Markets and Hierarchies: Analysis and Antitrust Implications* (New York: Free Press, 1975) as developed further in E. Neave, *The Economic Organisation of a Financial System* (London: Routledge, 1991), E. Neave, *Financial Systems: Principles and Organisation* (London: Rouledge, 1998), and E. Neave, *Modern Financial Systems: Theory and Applications* (New Jersey: Wiley, 2009).

[356] The FSB states that counterparty risk is the key to reducing systemic risk concentrations. Counterparty risk creates exposure and balance sheet linkages between financial institutions. See C. Duffin-Hall, 'Are the Lessons from the Financial Crisis on Using Modern Finance Theory as the Intellectual Framework for Financial Regulation Reflected in Post-Crisis Regulation?' (2019) 8(2) *UCL Journal of Law and Jurisprudence* 88, fn 145.

[357] J. Bricco and T. Xu, 'Interconnectedness and Contagion Analysis: A Practical Framework' (2019) IMF Working Paper WP/19/220, 17; available at: https://www.imf.org/en/Publications/WP/Issues/2019/10/11/Interconnectedness-and-Contagion-Analysis-A-Practical-Framework-48717 (date accessed: 4 January 2026). This paper refers to interdependency as explained in K. Forbes, 'The "Big C": Identifying Contagion' (2012) National Bureau of Economic Research, Working Paper 18465; available at: https://econpapers.repec.org/scripts/redir.pf?u=http%3A%2F%2Fwww.nber.org%2Fpapers%2Fw18465.pdf;h=repec:nbr:nberwo:18465 (date accessed: 4 January 2026).

[358] E. Neave, *Modern Financial Systems Theory and Applications* (New Jersey: Wiley, 2009), 4-5.

[359] *Ibid*., 9. Also, D. Crane, K. Froot, S. Mason, A. Perold, R. Merton, Z. Bodie, E. Sirri, and P. Tufano, *The Global Financial System: A Functional Perspective* (Boston: Harvard Business School Press, 1995).

[360] E. Neave, *Modern Financial Systems: Theory and Applications* (New Jersey: Wiley, 2009), xv.

[361] *Ibid*., 11.

As discussed throughout this chapter, systemic risk can be transmitted through 'channels.' There are three channels that could be discerned in relation to hedge funds. There is the exposure or counterparty channel.[362] This channel is closely linked to counterparty and credit risk. There is the asset liquidation or market channel. This channel is closely related to liquidity risk. There is also the critical function or substitutability channel. This channel is closely linked to reputational risk. Each channel has a built-in 'network effect' risk, or the concept of systemic risk transmission through intra-sectoral, cross-sectoral, or cross-border interconnectedness.[363] Systemic risk moving in and through these channels is referred to as contagion.

Contagion can be caused by interconnectedness at an intrabank cross-sectoral or cross-border perspective. Intrabank refers to the connection between banks. Cross-sectoral refers to the connection between banking and the asset management or hedge fund sector. Cross-border refers to the connection between financial institutions in differing jurisdictions. Each of these three dimensions of interconnectedness has a direct and indirect perspective. Direct linkages relate to information that is collected about the connection between financial institutions. This can include mandatorily reported data or balance sheet data about lending and funding risks. Indirect data is data that the supervisor collects from observing the market. This can include security price movements, investor sentiment and perception, and market trends.[364] This research is focused on the cross-sectoral interconnectedness of the hedge fund industry and its direct provision of information to regulators through mandatory disclosure.

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[362] Roncalli and Weisang, *supra* note 65, 11-14.
[363] *Ibid*.
[364] J. Bricco and T. Xu, 'Interconnectedness and Contagion Analysis: A Practical Framework' (2019) IMF Working Paper WP/19/220, 17; available at: https://www.imf.org/en/Publications/WP/Issues/2019/10/11/Interconnectedness-and-Contagion-Analysis-A-Practical-Framework-48717 (date accessed: 4 January 2026).

Contagion can also include informational contagion, where information asymmetry can lead to liquidity shocks that can trigger a systemic reaction.[365] The increasing reliance on advanced technologies in hedge fund operations has heightened the potential for contagion and spillover, as algorithmic trading, real-time data flows, and globally integrated platforms transmit market disturbances with greater speed and reach. These features of contagion serve to highlight two additional dimensions of systemic risk. Firstly, there is a cross-sectional dimension. This dimension focuses on concentration risk and shock transmission through counterparty interconnectedness. Secondly, there is a time dimension. This dimension focuses on macro-financial imbalances and the delay period whereby the contagion of systemic risk flows from the financial markets into the real economy.[366] Contagion is the mechanism by which systemic risk travels outside the financial market and into the real economy. It is also how systemic risk can carry a cross-border impact.

A large hedge fund, or many smaller hedge funds in aggregate, can have such a systemic impact through financial market counterparty connectedness in a repo and other trades. An example of this is the pre-2008 crisis event that caused Bear Stearns to collapse. Bear Stearns operated two leveraged hedge funds: the High-Grade Structured Credit Strategies Enhanced Leverage Fund and Bear Stearns High Grade Structured Credit Strategies Master Fund. Bear Stearns' injected over $1.6 billion into the Enhanced Leverage Fund to keep its leveraged positions from defaulting. However, it could not do so, and both hedge funds filed for bankruptcy.[367] The ramification was that Bear Stearns collapsed and was the first in a line of global bank failures due to interconnectedness and concentration of risk.[368]

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[365] Benoit *et al*, *supra* note 58, 119-121.
[366] Smaga, *supra* note 79*,* 9.
[367] M. Baily, R. Litan, and M. Johnson, 'The Origins of the Financial Crisis' (2008) Fixing Finance Series – Paper 3, Initiative on Business and Public Policy at Brookings 38; available at: https://www.brookings.edu/wp-content/uploads/2016/06/11_origins_crisis_baily_litan.pdf (date accessed: 4 January 2026).
[368] *Ibid*., 38-39.

Contagion is also referred to as a domino effect.[369] This is because contagion cannot occur without an initial systemic shock, which causes transmission at a scale and pace that does not happen under normal conditions.[370] This domino effect means that systemic risk can have a negative knock-on impact on healthy financial institutions, not just the weak ones. Any institution that has not taken the potential for negative externalities into account in its risk management can be vulnerable to contagion.[371] As hedge funds are investors in the market like other institutions, they are on both sides of the contagion fence. Hedge funds can contribute to contagion, or hedge funds can be healthy investors hit by an unhealthy falling domino. This research is focused on the former scenario but recognises that the latter can also occur. While the relationship between leverage, systemic risk, and contagion is important, the real difficulty is in quantifying and measuring the level of interconnectedness and contagion that result from them.[372] This is especially true in the opaque hedge fund industry, as will be addressed in the following section.

2.3.5. Systemically relevant financial institutions

In addition to measuring systemic risk, there is also a regulatory mechanism for identifying individual institutions as systemically relevant. This brings a new dimension to the measurement of systemic risk by regulators and oversight bodies. The methods of measuring systemic risk – which are outlined above in section 2.3.3 – focus on a macro view of systemic

[369] T. Markwat, E. Kole and D. van Dijk, 'Contagion as a Domino Effect in Global Stock Markets' (2009) 33(11) *Journal of Banking & Finance* 1996.
[370] Smaga, *supra* note 77, 11.
[371] *Ibid*., 12.
[372] Z. Liu, S. Quiet, and B. Roth, 'Banking sector interconnectedness: what is it, how can we measure it and why does it matter?' (2015) 55 *Bank of England Quarterly Bulletin* 130.

risk. However, a mechanism also exists that subjectively reviews individual organisations to determine if they pose a systemic risk to the market on their own. As discussed in section 2.3.1, systemic risk is difficult to define or determine *ex ante* a market collapse. However, this mechanism of rating market participants attempts to create an element of certainty around the existence of systemic risk by pinpointing the institutions that represent demonstrable systemic risk. It is important to review this mechanism and to identify whether hedge funds have been placed in the category of being systemically important. This, in turn, helps to determine whether or not leveraged hedge funds are an automatic source of potential systemic risk. By examining how the mechanism classifies financial institutions, it is possible to assess whether similar principles apply to leveraged hedge funds and whether their activities could amplify systemic risk.

The project to identify financial institutions as being systemically important or not started with the Basel Committee and the creation of five risk categories and 13 indicators therein to measure banks' systemic risk post-2008 crisis.[373] Under this method, the Basel Committee selected 75 banks to assess. A total of 30 banks had a result greater than the average result for the 75 banks. Therefore, they were defined as globally systemically important banks (G-SIBs). A similar approach was then created for globally systemically important insurers (G-SIIs) by the International Association of Insurance Supervisors (IAIS).[374] However, there were five categories and 17 corresponding indicators for insurers to reflect the slightly different risk metrics in that industry.[375] There is also a distinction made between domestic

[373] Basel Committee on Banking Supervision, 'Global systemically important banks: revised assessment methodology and the higher loss absorbency requirement' July 2018, 4; available at: https://www.bis.org/bcbs/publ/d445.pdf (Date accessed: 4 January 2026).
[374] In December 2022 the G-SII framework was suspended. See FSB, FSB endorses the IAIS Holistic Framework and discontinues identification of Global Systemically Important Insurers (G-SIIs), available at: https://www.iais.org/2022/12/fsb-endorses-the-iais-holistic-framework-and-discontinues-identification-of-global-systemically-important-insurers-g-siis/ (date accessed: 4 January 2026).
[375] International Association of Insurance Supervisors, 'Global Systemically Important Insurers: Updated Assessment Methodology' 16 June 2016, 14; available at:

(D-SIFI) and global (G-SIFI) SIFIs.[376] Although much focus is placed on the systemic risk that banks pose within the financial system, banks are not the only contributors to this risk. The application of this methodology to non-bank non-insurers, such as hedge funds, is under the combined direction of the Financial Stability Board (FSB) and the International Organization of Securities Commissions (IOSCO). As of December 2025, these organisations have still not yet finalised the assessment methodology for NBNI G-SIFIs, which is not annual like the G-SIB.[377] Under the NBNI G-SIFI methodology, the FSB has categorised financial institutions in terms of their systemic importance. Systemic importance is a measure of the disruption that the distress or failure of a financial institution would have on the financial system. The FSB defines systemic importance with reference to size,[378] interconnectedness,[379] substitutability,[380] complexity,[381] and cross-jurisdictional activity.[382]

https://www.iais.org/uploads/2022/01/160616-Updated-G-SII-Assessment-Methodology-New.pdf (date accessed: 4 January 2026).

[376] Financial Stability Board, 'Progress and Next Steps Towards Ending "Too-Big-To-Fail" (TBTF)' 2 September 2013; available at: https://www.fsb.org/wp-content/uploads/r_130902.pdf?page_moved=1 (date accessed: 4 January 2026). The result of this project is that financial institutions are categorised as (1) Global systemically important banks (G-SIBs); (2) Global systemically important insurers (G-SIIs); or (3) Non-bank non-insurer global systemically important financial institutions (NBNI G-SIFIs).

[377] Financial Stability Board, 'Implementation and Effects of the G20 Financial Regulatory Reforms: 5th Annual Report' 16 October 2019, 8; available at: https://www.fsb.org/wp-content/uploads/P161019.pdf (date accessed: 4 January 2026).

[378] Size refers to assets under management (AUM) and gross notional exposure (GNE).

[379] Interconnectedness relates to balance sheet financial leverage, leverage ratios, the ratio of GNE to net asset value (NAV), collateral to NAV, counterparty credit exposure, and intra-financial system liabilities globally systemically important financial institutions (G-SIFIs), and the nature of investors. Therefore, leverage is folded into a systemic risk assessment of an entire organisation rather than being evaluated on its own.

[380] Substitutability refers to the percentage of trading volume, the percentage of holdings in certain asset classes, and the ratio of NAV to the size of the market.

[381] Complexity refers to the percentage of non-centrally cleared derivatives, the percentage of re-used collateral, the percentage of high-frequency trading (HFT) strategies, liquidity profile, the ratio of unencumbered cash to GNE, the ratio of unencumbered cash to NAV, and the amount of less liquid assets.

[382] Cross-jurisdictional activity refers to the number of jurisdictions in which the fund invests, the number of jurisdictions in which the fund is sold or listed for sale, and the number of jurisdictions where the fund has counterparties. Financial Stability Board, 'Reducing the moral hazard posed by systemically important financial institutions' 20 October 2010, 2; available at: https://www.fsb.org/wp-content/uploads/r_101111a.pdf?page_moved=1 (date accessed: 4 January 2026). Roncalli and Weisang, *supra* note 63, 17.

NBNI-SIFIs were categorised last because they fall within the least well-understood sector of financial markets that potentially represent a systemically important risk. [383] Hedge funds are part of the NBNI-SIFI category, but there is currently no agreed methodology for assessing NBNIs as systemically important. Therefore, no hedge fund has been categorised as an NBNI-SIFI yet.

However, there are two problems with regulatory reform that seeks to identify individual firms as systemically important or to alter capital requirements, such as for banks under Basel. Firstly, focusing on individual firms is not the same as focusing on the entire market. Effective systemic risk regulation requires a focus on the whole system. Identifying particular institutions as systemically risky is completely separate from measuring the accumulated anonymous shocks within a market that can lead to financial paralysis.[384] Secondly, just because a regulatory measure stipulates that it is based on the rationale of combatting systemic risk, it does not mean that the measure actually does successfully combat systemic risk.[385] Therefore, from a theoretical and practical perspective, this methodology does not yet help to ascertain the relationship between hedge funds and systemic risk.

2.3.6. Risk-intensive practices of hedge funds

As discussed in 2.2.4., hedge funds measure their portfolio risk in order to determine the value at risk within their portfolio from potential volatility within the market. Hedge funds

[383] D. Busch and M. van Rijn, 'Towards Single Supervision and Resolution of Systemically Important Non-Bank Financial Institutions in the European Union' (2018) 19 *European Business Organization Law Review* 303. See also, European Banking Authority, 'Guidelines for the identification of globally systemically important institutions' available at: https://www.eba.europa.eu/risk-and-data-analysis/risk-analysis/risk-monitoring/global-systemically-important-institutions-g-siis (date accessed: 4 January 2026).
[384] D. Bryan, M. Rafferty and D. Wigan, 'Capital Unchained: Finance, Intangible Assets and the Double Life of Capital in the Offshore World' (2017) 24 *Review of international political economy* 56.
[385] V. Acharya, L. Pedersen, T. Philippon, and M. Richardson, 'Measuring Systemic Risk' (2017) 30 *The Review of Financial Studies* 2-3.

are not focused on measuring systemic risk. Hedge funds are focused on measuring the risk to the profitability of their portfolio positions. However, risk must be taken in executing their investment strategies within a volatile market. Although a hedge fund views risk from a threat to portfolio value perspective, a regulator views the aggregate risk across all market participants from the perspective of how it may threaten the financial system.

This section aims to address the risk-intensive practices that a hedge fund engages in to make its return, thus acting as a potential source of systemic risk. This section will firstly outline *why* hedge funds take such high risks compared to other market participants. Secondly, the section will explain *where* this risky behaviour takes place. Thirdly, the section will assess *how* hedge funds increase their riskiness.

2.3.6.1. Higher risk-taking market participants

As discussed in Chapter 1, hedge funds are an unrestrained form of asset management. As such, hedge funds combine shorting and leveraging practices into proprietary investment strategies. The extent to which risk-taking features as part of these investment strategies is dependent on several factors. Firstly, the level of assets under management that belong to the hedge fund manager and not the client. Hedge funds can be anywhere on the spectrum of being 100 per cent client money up to 100 per cent hedge fund manager money. Sherman *et al* extensively surveyed the hedge fund industry post-2008 and determined that risk-taking by a hedge fund is substantially influenced by where the hedge fund profile sits on this spectrum. The greater the level of hedge fund managers' money in the fund, the lower the level of

risk-taking.[386] This is because the higher the level of hedge fund manager money in the fund, the less the performance fee incentive to take risk.

A second significant influence on the risk-taking of a hedge fund is the incentive fee that a hedge fund receives for hitting a high-water mark.[387] As discussed in 1.5.2., a '2 and 20' fee structure exists in most hedge funds.[388] The 2 per cent is a management fee and is accrued on the assets under management of the portfolio. It is payable irrespective of the performance of the hedge fund. The 20 per cent is a performance fee that is earned when a hedge fund's performance rises above its previous high. This previous high-performance level is known as the high-water mark. The management and performance fee is paid to the hedge fund's manager. Higher risk-taking is engaged in if a hedge fund is trying to exceed its previous high-water mark. Therefore, risk-taking is incentivised by the performance fee.

A third influence on risk-taking is the formalisation and transparency of risk management practices, internally implemented at the organisational level, that have been introduced since 2008.[389] These risk management practices have been supported by behavioural controls, such as rules surrounding remuneration. Such regulations have been introduced specifically to combat excessive risk-taking.[390] However, such regulatory intervention does not form part of the regulatory analysis of this thesis and therefore is only mentioned as an influence on the risk-taking of hedge funds.

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[386] M. Sherman, P. Lee, and A. Lo, 'Hedge Funds: A Dynamic Industry in Transition' (2015) 7 *Annual Review of Financial Economics* 483.
[387] S. Darolles and C. Gourieroux, 'Performance Fees and Hedge Fund Return Dynamics' (2015) 65 *International Journal of Approximate Reasoning* 45.
[388] See 1.5.2.2.
[389] Financial Stability Board, 'Strengthening Governance Frameworks to Mitigate Misconduct Risk: A Toolkit for Firms and Supervisors' (20 April 2018); available at: https://www.fsb.org/wp-content/uploads/P200418.pdf (date accessed: 4 January 2026).
[390] Financial Stability Board, 'Implementing the FSB Principles for Sound Compensation Practices and their Implementation Standards: Fifth progress report' (4 July 2017), 1; available at: https://www.fsb.org/wp-content/uploads/P040717-6.pdf (date accessed: 4 January 2026).

2.3.6.2. Trading on opaque financial markets

Dark pool trading platforms are venues where market participants can buy and sell large orders without fear of disadvantageously moving the market price of the security being traded. This is made possible because the buyer and seller identities are kept anonymous, and larger trades are broken up into smaller sizes. Although dark pools are usually used by large pension funds that trade daily in large volumes, hedge funds have increased their access to dark pool platforms to benefit from the ability to remain anonymous.[391]

Trading in opaque dark pools in complex off-exchange products is a way to maintain secrecy.[392] This secrecy extends to other market participants and investors in the hedge fund itself.[393] The purpose of maintaining secrecy from other market participants is to ensure that other hedge funds do not engage in herding or usurping the investment opportunity. The purpose of maintaining secrecy is to ensure that investors do not exit the fund without understanding all of the risk elements that are being balanced.[394] However, this secrecy from investors can cause concern about the authenticity and sustainability of returns.[395]

In terms of opaque products and markets, hedge funds trade in derivatives and synthetic products off-exchange as well as on-exchange. Financial products such as OTC derivatives

[391] K. Johnson, 'Regulating Innovation: High Frequency Trading in Dark Pools' (2017) 42(4) *The Journal of Corporation Law* 833.
[392] J. Brugler and C. Comerton-Forde, 'Differential Access to Dark Markets and Execution Outcomes' (2025) 171 *Journal of Financial Economics* 1. Y. Sato, 'Opacity in Financial Markets' (2014) *Swiss Finance Institute Research Paper No. 13-63; a*vailable at: https://ssrn.com/abstract=2371384 (date accessed: 4 January 2026).
[393] *Ibid*., 3.
[394] *Ibid*., 14.
[395] S. Gorovyy, P. Kelly, and O. Kuzmina, 'Does Secrecy Signal Skill? Own-Investor Secrecy and Hedge Fund Performance' (2021) 133 *Journal of Banking & Finance* 1. Z. Smith and M. Mumtaz, 'Hedge Fund Managers and Deceit: Is the Accusation of Performance Manipulation Valid?' (2017) 11(3) *Chinese Management Studies* 389.

and structured products can still be traded bilaterally off-exchange and remain untransparent. Derivatives are not just a source for hedging risk but are a way for hedge funds to trade risk and earn a return. Therefore, an incentive still remains for hedge funds to remain invested in opaque products and markets. In the face of a mass-market move to transparency and exchange-traded products, the question is why hedge funds would want to remain trading in opaque products and markets. The answer is that the opacity premium still exists. This means that value is created for investors by transacting in these products and markets. However, it comes at the price of increased risk-taking.[396]

The financial stability problem with this type of risk-taking is that it is unclear where the risk travels within the financial market, as bilaterally traded securities off-exchange are not transparent. This is the reason why mandatory disclosure regimes have been introduced as a means to combat the issue of opacity, risk-taking, and resulting systemic risk. The nature and use of mandatory disclosure will be evaluated in Chapter 3.

2.3.6.3. Trading of complex or illiquid financial products

The trading of derivatives and leveraged securities, such as repos, by hedge funds is particularly impactful from a portfolio and systemic risk perspective. These complex securities are often traded on margin, which is dependent on liquidity within markets.[397] When margin calls are difficult to meet because pledged assets are illiquid, a process of

[396] C. Argyropoulos, E. Panopoulou and S. Vrontos, 'Downside Risk and Hedge Fund Returns' (2025) 171 *Journal of Banking & Finance* 1. F. Januzzi, A. Bressan and F. Moreira, 'Opacity in Hedge Funds: Does it Create Value for Investors and Managers?' (2019) 17 *Brazilian Business Review* 640.
[397] J. Bian, Z. Da, Z. He, D. Lou, K. Shue, and H. Zhou, 'Margin Trading and Leverage Management' (2021) University of Chicago, Becker Friedman Institute for Economics Working Paper No. 2021-29.

raising cash through a 'fire sale' is engaged. However, the fire sale itself can destabilise security prices and, consequently, the market.[398]

As these complex and illiquid products are traded and pledged in the repo market, it is necessary to understand the onward link to systemic risk. As discussed above, the repo market is closely connected to potential systemic risk from a hedge fund perspective for two reasons.[399] Firstly, the repo market has become the primary market where hedge funds obtain leverage. Secondly, the repo market is the core of how hedge funds finance their short-selling practices.[400] Therefore, the two most defining characteristics of hedge funds are almost exclusively enabled by the repo market.

The potential systemic risk associated with hedge funds using the repo market is often tied to the haircut.[401] If the market becomes volatile, the value of pledged collateral can fall.[402] This means that the divide between the value of the collateral posted by a hedge fund and the size of the loan widens. This means that the pledged collateral must be increased or part of the loan paid down. This will return the trade to its agreed collateral value to the outstanding loan value. Systemic risk emerges from the default risk and the resulting fire-sale of portfolio assets or pledged collateral when the hedge fund borrower cannot fund this realignment.[403] Explained from the hedge fund borrower perspective, collateral is posted via 'initial' and 'variation' margin.[404] The initial margin is represented by the initial collateral posted. Every time the market value of posted collateral falls, additional collateral must be posted as a

[398] M. Oehmke, 'Liquidating Illiquid Collateral' (2014) 149 *Journal of Economic Theory* 183. A. Shliefer and R. Vishney, 'Fire Sales in Finance and Macroeconomics' (2011) 25 *Journal of Economic Perspectives* 29.
[399] See 2.2.3.2.
[400] Gabor, *supra* note 49, 968.
[401] C. Julliard, Z. Liu, S. Seyedan, K. Todorov, K. Yuan, 'What Drives Repo Haircuts? Evidence from the UK Market' (January 30, 2019); available at: https://ssrn.com/abstract=3374969 (date accessed: 4 January 2026).
[402] McVea, s*upra* note 47.
[403] Boissel *et al*, *supra* note 52, 514.
[404] See 2.2.3.2.

variation margin.[405] During turbulent market conditions, constant collateral adjustments need to be made. This frequent call for variation margin to replace the declining collateral value can trigger a 'repo run.'[406] Therefore, there are ultimately two systemic risk transmission channels for repo runs. Firstly, there could be a contraction in the market value of the collateral for all market participants that have posted that same collateral. Secondly, there is the possibility that variation margin calls may cause creditworthiness concerns and ultimately result in counterparty default concerns.[407] With the increasing use of repos by hedge funds, increased pledging of higher percentages of the portfolio as collateral for leverage, and the rising volatility in financial markets, the trading of complex and illiquid assets is arguably storing up a growing potential for systemic impact.[408]

Analysis of the 2008 financial crisis has highlighted how heavily hedge funds participated and relied on short-term securities financing, such as repos, to fund their investment strategies.[409] The repo market has been described as the 'epicentre' of the crisis. Hedge funds placed an overreliance on the value of their collateral and underestimated the extent to which repos could be subject to 'runs', as with bank deposits.[410] The repo market has had structural vulnerabilities and thus fed systemic risk from two perspectives – the transmission and accumulation of risk through repo trading and the materialisation of systemic risk through a 'repo run' event. By virtue of their position as economic owners of posted collateral, the

[405] A. Miglietta, C. Picillo and M. Pietrunti, 'The impact of CCPs' margin policies on repo markets' BIS Working Papers No 515 (October 2015); available at: https://www.bis.org/publ/work515.pdf (date accessed: 4 January 2026).
[406] McVea, *supra* note 54, 12.
[407] *Ibid*., 13.
[408] Bank of England, 'Have hedge funds increased their use of repo borrowing?' (7 February 2020); available at: https://www.bankofengland.co.uk/bank-overground/2020/have-hedge-funds-increased-their-use-of-repo-borrowing (date accessed: 4 January 2026).
[409] FSB, Risk Management Lessons from the Global Banking Crisis of 2008 (21 October 2009); available at: https://www.fsb.org/uploads/r_0910a.pdf (date accessed: 4 January 2026).
[410] *Ibid*., 88. Also, M. Carlson and M. Macchiavelli, 'Emergency Loans and Collateral Upgrades: How Broker-Dealers Used Federal Reserve Credit During the 2008 Financial Crisis' (2020) 137(3) *Journal of Financial Economics* 701. G. Gorton and A. Metrick, 'Securitized Banking and the Run on Repo' (2012) 104(3) *Journal of Financial Economics* 425.

question has been posed whether hedge funds are a primary trigger of repo runs and, thus, triggers of systemic risk.[411]

2.4. Conclusion

This chapter has addressed three significant issues. Firstly, hedge funds have access to different forms of synthetic leverage. Secondly, the impact that synthetic leverage has on portfolio risk. Thirdly, the accumulation and transmission of individual hedge fund leverage and portfolio risk into systemic risk.

In part 2.2, regulatory arbitrage was explained as a catalyst for the structural shift in capital markets that has been migrating from bank-based financial leverage to a market-based synthetic leverage model. The synthetic leverage options available to hedge funds include derivatives and repos. The use of such leveraging instruments has intensified within the hedge fund industry, effectively aligning portfolio risk and leverage risk calculations for hedge funds. In part 2.3, the origins of systemic risk concerning leveraged hedge funds were addressed. This included a review of the definitional problem surrounding systemic risk, identifying the phases in the systemic risk cycle, differentiating between assessing collective industry systemic risk and individual hedge fund systemic risk, highlighting the critical role that interconnectedness plays in creating contagion cross-sectorally and cross-border, and the risk practices that are specific to hedge funds. Chapter 3 will build on this analysis by explaining how mandatory disclosure regimes are used to identify and combat systemic risk.

[411] McVea, *supra* note 47, 177.

Chapter 3 MANDATORY DISCLOSURE AS A MECHANISM FOR IDENTIFYING AND COMBATTING HEDGE FUND SYSTEMIC RISK

3.1. Introduction

This chapter will concentrate on evaluating mandatory disclosure as an appropriate and effective regulatory tool for identifying and combatting systemic risk. Over the previous two chapters, this thesis has sought to clarify the nature of hedge funds, their primary features and the relationship of their leveraging practices to systemic risk. The preceding chapters have demonstrated that hedge fund risk-taking and leverage have often operated under considerable opacity. This opacity has strengthened the post-crisis motives for disclosure-based regulatory intervention in the hedge fund industry, as part of a range of measures introduced to protect market stability and investors. Regulatory intervention is required to remedy the information-related imbalances existing within financial markets. This chapter recognises that there have been many different forms of regulatory intervention to combat systemic risk within the hedge fund industry over the past decade, ranging from reforming remuneration incentives to introducing capital adequacy rules to providing for the liability of delegates and custodians. This chapter will argue that mandatory disclosure is essential to identify and combat systemic risk, but that, in doing so, mandatory disclosure must exhibit certain characteristics, such as being real-time.

This chapter will be divided into five parts. Part 3.1 will introduce the rationales for regulatory intervention as a foundation to the focused discussion on the role of information and its regulation through mandatory disclosure.

Part 3.3 will address the theoretical basis for the role of information. Part 3.3 will address the role of information in efficiently functioning financial markets by reviewing seminal theoretical models, such as the Efficient Market Hypothesis (EMH) and the Capital Asset Pricing Model (CAPM). A common characteristic of both models is that they display information-based assumptions. Whilst the CAPM uses these assumptions to address the efficient functioning of an individual portfolio, the EMH focuses on the market-wide perspective. Therefore, the EMH is the model which the chapter will concentrate on to explain the relationship between information and efficiently functioning markets. This part will demonstrate that, without information disclosure, the potential consequence is that markets will not function efficiently. However, in and of itself, disclosure or transparency is not enough to reduce this outcome. It must be the right data that is disclosed. Effective transparency must be attained through a mandatory disclosure regime, where the purpose of compulsory disclosure of predefined data is to support market-wide intervention to restore efficiency.

Part 3.4 will address the relationship between mandatory disclosure and systemic risk. It will look at a market as an interconnected system and analyse the relationship between mandatory disclosure and systemic risk. The purpose of this part is to argue that mandatory disclosure is only functional in identifying and combatting systemic risk if the disclosed data provides beneficial information and actionable intelligence to a supervisory body. Although not a defined term, actionable intelligence, as a technology-related term, can be viewed as the

gathering and structuring of data to inform and to support timely decision-making. This decision-making should concern risks that the data set can measure. Part 3.5 will identify several design features of an effective mandatory disclosure regime based on a review of existing mandatory disclosure regimes within securities markets. This part will contain a review of the strengths and weaknesses of two market-wide mandatory disclosure regimes under which the hedge fund industry is liable to report. The European Market Infrastructure Regulation (EMIR)[412] and the Securities Financing Transactions Regulation (SFTR)[413] will be reviewed to demonstrate that (1) real-time mandatory disclosure must be present in an effective regime that attempts to identify and to combat systemic risk, and (2) such regimes must focus on both the disclosure of transmission risk through trade reporting and the accumulation, or storage of risk, through position reporting. Therefore, the purpose of this part is to argue the case for enhancing the approach of the existing mandatory disclosure regime[414] towards systemic risk identification and towards the combatting of risk, particularly by including more identifiably effective design criteria.

3.2. Justification for regulatory intervention

The motivations for why regulation is introduced can be extremely diverse and depend to a large extent upon the mandate that a regulator is given. Public concern, industry pressure, or political interest could be seen as motivations for introducing regulatory measures.[415]

[412] 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, [2012] OJ L201/1.
[413] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1.
[414] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Annex IV.
[415] See A. Ogus, *Regulation: Legal Form and Economic Theory* (London: Hart Publishing, 1994) where Ogus breaks regulatory theory into public and private interest theories.

However, this section will restrict its summary of regulatory intervention justifications to those relevant to financial services regulation.[416]

Regulation has been referred to by Baldwin as 'the promulgation of an authoritative set of rules, accompanied by some mechanism, typically a public agency, for monitoring and promoting compliance with these rules.'[417] However, while capturing the essence of regulation, this is by no means the only interpretation. Ogus refers to regulation in much broader terms as a 'form of behavioural control, whatever the origin.'[418]

Although rules are used as a behavioural control restriction, Baldwin and Ogus agree that they may also be employed equally as a facilitative tool.[419] Regulation could be used to prevent socially undesirable behaviour by market participants through the imposition of criminal sanctions, financial penalties or taxes. Similarly, socially or economically desirable activities could be encouraged or facilitated through the granting of financial subsidies or licences.

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[416] See S. Breyer, *Regulation and Its Reform* (Cambridge: Harvard University Press, 1982). Also see S. Breyer, 'Typical Justifications for Regulation' in R. Baldwin, C. Scott & C. Hood (eds.), *A Reader on Regulation* (London: Oxford University Press, 1998), 72. Also, see I. Ayers and J. Braithwaite, *Responsive Regulation* (New York: Oxford University Press, 1992). Also, see J. Black, *Rules and Regulators* (Oxford: Clarendon Press, 1997). Also, Ogus argues that depending on the market failure regulatory intervention may take varying degrees of severity. A market failure may be counteracted by means of information regulation, command and control regulation, a prior approval and licensing regime, use of economic instruments or private regulation. See A. Ogus, *Regulation: Legal Form and Economic Theory* (London: Hart Publishing, 1994) for a full discussion on differing regulatory methods.

[417] See R. Baldwin, C. Scott and C. Hood, *A Reader on Regulation* (London: Oxford University Press, 1998) where regulation is divided into categories – (1) a set of commands or binding set of rules, (2) a form of deliberate state intervention such as command and control or incentives based regulation, and (3) any form of social intervention. See also P. Selznick, 'Focusing Organisational Research on Regulation' in R. Noll ed., *Regulation Policy and the Social Sciences* (University of California Press, 1985), p. 363 which also describes the 'central meaning' of regulation to include 'sustained and focused control exercised by a public agency over activities that are valued by a community.'

[418] A. Ogus, *Regulation: Legal Form and Economic Theory* (London: Hart Publishing, 1994), 1. However, Ogus does make it clear that politically this definition is too broad a concept. See B. M. Mitnick, *The Political Economy of Regulation* (New York: Columbia University Press, 1980) for a wide variety and analysis of the different interpretations and meanings of the term 'regulation'.

[419] R. Baldwin and M. Cave, *Understanding Regulation* (London: Oxford University Press, 1999), 2. See also A. Ogus, *Regulation: Legal Form and Economic Theory* (London: Hart Publishing, 1994) for an analysis of both restrictive and facilitative aspects of regulation as applied to Ogus' two classic systems of economic organization – (1) market system, and (2) collective system.

The predominant justifications or rationales for regulatory intervention include the control of economic rent or excess profits, the control of monopoly power, anti-competitive behaviour and predatory pricing,[420] rationalisation,[421] public goods,[422] scarcity of supply,[423] distributional

[420] In a competitive market a situation may arise where one or more market participants engage in uncompetitive behaviours. This may be in order to drive competitors out of the market or create barriers to entry. A common way of engaging in such behaviour is known as predatory pricing. This is where a competitor within the industry begins to sell goods and services below cost. However, once suppliers have exited the market prices will be increased to the detriment of consumers. This form of anti-competitive behaviour therefore justifies regulation to protect consumers from the negative effects of subsequent higher prices as a result of sustained predatory pricing. Therefore, regulation is used as a restrictive tool in this situation. However, as a precondition to successful predatory pricing a supplier must be strong enough to sustain prolonged revenues below variable costs, and, barriers to re-entry into the market must be so high that the predatory pricer can increase prices after the event to recoup all previous losses. From an economic perspective predatory pricing therefore is a wasteful use of resources and does not benefit society in the long-term. Therefore, regulators must be constantly vigilant in their supervisory of the market in order to detect such undesirable activity.

[421] Rationalisation occurs where there are numerous small and dispersed market participants which are threatened with failure that may benefit from a collective arrangement with a public agency as opposed to individual private law arrangements. Collective agreement leading to the lowering of unit cost is viewed as an economic justification for facilitative intervention in the market. However, there is much debate about whether or not regulatory intervention on this ground is appropriate as from a political or managerial perspective such a joint plan may prove more inefficient. See S. Breyer, *Regulation and Its Reform* (Cambridge: Harvard University Press, 1982), 33 in which he refers to US Federal Power Commission National Power Survey of 1964 to demonstrate the issues that arise when such collective planning is undertaken. Environmental, political, regulatory and managerial problems negate the theoretical benefits of this collective negotiation.

[422] A public good is a commodity in which society as a whole maintains an interest. Ogus refers to the two characteristics of a public good as: an individual's consumption of the good does not reduce that available to another consumer, and, it is not possible or not efficient to exclude what Baldwin calls 'free riders' from using the good. See R. Baldwin and M. Cave, *Understanding Regulation* (London: Oxford University Press, 1999), 13. Also, see A. Ogus, *Regulation: Legal Form and Economic Theory* (London: Hart Publishing, 1994), 33 for a discussion of pure and impure public goods such as national security and electricity respectively. Ogus outlines the example of defense services provided by government in return for people paying taxes. Irrespective of who pays taxes everyone is able to enjoy the benefit of national security in equal amounts. For this reason the distribution of public goods cannot conform to the economic concept of allocative efficiency. Therefore, this is a facilitative social justification for regulatory intervention. The normal rules of supply and demand do not operate with respect to public goods because demand is not determined by consumers' willingness to pay for the good. Although national security is a pure public good the argument also applies to impure public goods such as water and electricity where private operators may exist but where a public agency is charged with ensuring supply is maintained at acceptable quantitative and qualitative levels.

[423] From an economic perspective the supply of goods should not be regulated as price is the mechanism the market uses to distribute goods in short supply. The scarcer a good becomes the higher the price becomes in order to find an equilibrium point where supply equals demand. However, if the good being supplied has some social significance then it may be necessary to regulate supply in the pursuit of that public interest objective. Therefore, such regulatory intervention is facilitative in nature. This tends to be an issue in cyclical industries such as travel or natural gas where regulation is introduced to ensure that year round service or supply is maintained instead of firms opening and closing throughout the year in tandem with the seasonality of demand. See A. Ogus, *Regulation: Legal Form and Economic Theory* (London: Hart Publishing, 1994), 43. The costs imposed on consumers through higher fixed prices are deemed to outweigh the cost caused by the constant opening and closing of operations that may have significant undesirable social effects. However, this justification for regulation may be criticized from an economic perspective as representing an unfair cross-subsidy which is both inefficient and wasteful. However, from a social perspective it nonetheless may be seen as a desirable outcome which would suggest that regulators are likely to prioritise social justifications above economic justifications.

justice,[424] and excessive competition.[425] However, these will not form the basis of our assessment. This thesis is more concerned with the justification of information inadequacy, which is more closely associated with financial regulatory intervention.

The existence of adequate information is essential to a competitive market, but often, regulatory intervention is necessary to compel such efficient levels of disclosure.[426] Such regulatory intervention may be due to information being withheld from the market for political reasons or because its production is too expensive. Breyer explains the reasons why there may be inadequate information in the market. Firstly, where the incentive to produce and disseminate information is somehow curtailed. Information can often be expensive to produce but cheap to disseminate, and where those in control of information feel that its distribution will result in the forbearance of a perceived benefit, then distortion within the

[424] Those in support of distributional justice argue that in certain circumstances economic goals should be superseded by a responsibility to safeguard the welfare of society. See A. Ogus, *Regulation: Legal Form and Economic Theory* (London: Hart Publishing, 1994), 46. Far from being concerned with the efficiency of which wealth is distributed it is a matter of fairness and justice. Also, see R. Nozick, *Anarchy, State and Utopia* (New York: Basic Books, 1974). and V. George and P. Wilding, *Ideology and Social Welfare* (New York: Routledge, 1985).

[425] Excessive competition has been advanced as a reason why such industries as air, road haulage and shipping have experienced periods where prices have been reduced to unprofitable levels in an attempt to squeeze out inefficient firms. Although not in agreement Breyer refers to three specific justifications advanced as support for regulation in such situations. Firstly, under a situation where a natural monopoly exists it may be detrimental to have several competitors enter the market all vying for market share. See R. Baldwin and M. Cave, *Understanding Regulation* (London: Oxford University Press, 1999), 10 where Baldwin defines a natural monopoly as occurring 'when economies of scale available in the production process are so large that the relevant market can be served at the least cost by a single firm. It is accordingly less costly to society to have production carried out by one firm than by many.' Such excessive competition is argued as wasteful and inefficient. See S. Breyer, *Regulation and Its Reform* (Cambridge: Harvard University Press, 1982), 29 for an explanation of why regulation on this ground is opposed. The competitive process should be free and unhindered in order to find its own equilibrium point in the market and determine if in fact a natural monopoly exists or not. Secondly, in industries where demand is cyclical a lack of regulation may lead to economic waste. Such an example may be the holiday travel market where demand in centred on specific seasons. Regulatory intervention in the form of minimum prices to subsidise times of slow demand is tabled as appropriate. Thirdly, in industries that are particularly prone to predatory pricing regulatory intervention on the grounds of excessive competition is appropriate. Such an example may be in the retail industry where large grocers may engage in below cost selling. The existence of a monopoly, seasonality of demand, or predatory pricing will be a specific justification for regulation, the sum of which will support the excess competition rationale for regulation.

[426] See F. Hayek, 'The Use of Knowledge in Society' (1945) 35 *American Economic Review* 519 in which it is explained that for a competitive market to operate efficiently and effectively consumers must have sufficient information at their disposal to make decisions about competing products or services. Also, see R. Baldwin and M. Cave, *Understanding Regulation* (London: Oxford University Press, 1999), 12 where Baldwin states: 'Regulation, by making information more extensively accessible, accurate, and affordable, may protect consumers against information inadequacies and the consequences thereof and may encourage the operation of healthy, competitive markets.'

market will occur. Secondly, in securing a benefit, a party to a contract may omit certain critical pieces of information or even distribute misleading information to the other party. Thirdly, in choosing between competing products, a lay buyer may not be able to evaluate certain characteristics of products, and therefore intervention on their part may be necessary in order for them to make an informed decision. Fourthly, if there is a lack of competition on the supply side, then situations may arise where full information is not given to all participants on the buy side of the market.[427] However, without adequate information, confidence in the market will falter. Therefore, the necessity for an efficient market is the provision of adequate information, and therefore, it serves as a compelling justification for regulatory intervention in financial markets.[428]

3.3. Theoretical basis for the role of information in financial markets

This part of the chapter addresses theories surrounding the role and importance of information in the orderly functioning of financial markets. It will focus on the CAPM and the EMH to demonstrate the theoretical basis for the role of information in the efficient functioning of financial markets. As will be addressed in this part, both models regard a series of information-based assumptions as necessary for markets to function efficiently.

This part will be divided into two sections. By reviewing the assumptions of modern finance theoretical models, the first section will demonstrate the central theoretical basis for the role of information in the orderly running of financial markets. By understanding the nature and

[427] See S. Breyer, 'Typical Justifications for Regulation' in R. Baldwin, C. Scott and C. Hood (eds.), *A Reader on Regulation* (London: Oxford University Press, 1998), 72.
[428] A. Schwartz and L. Wilde, 'Intervening in Markets on the Basis of Imperfect Information: A Legal and Economic Analysis' (1979) 127 *University of Pennsylvania Law Review* 630. Also, see H. Beales, R. Craswell and S. Salop, 'The Efficient Regulation of Consumer Information' (1981) 24 *Journal of Law and Economics* 491.

effects of information in 'efficient' financial markets, it should be possible to understand how information's advertent, or inadvertent, absence may potentially lead to disorderly or inefficient markets or, ultimately, to a market failure. The second section will address the role of disclosure in combatting the disorderly functioning of a market. In demonstrating why mandatory disclosure is the most effective tool to identify and combat a potential information-based market failure, this section will include an assessment of the characteristic features of voluntary and mandatory disclosure regimes generally.

3.3.1. *The role of information-based assumptions in models of efficient capital markets*

In general, modern finance theories seek to understand the forces within capital markets in order to predict market outcomes. To refer to EMH as one instance of such a theoretical model, market outcomes are based upon economic assumptions of perfect competition. In this framework, a perfect balance exists between buy-side and sell-side forces, full information is available to make decisions, and no transaction costs exist. All decision-making is predictable and based on the concept of rationality, a premise which will be further critiqued in this part of the chapter.[429] This aligns with other Law and Economics approaches, which evaluate rules and institutions in terms of efficiency. For example, the Coase Theorem[430] showed that, without transaction costs, private bargaining between rational actors leads to efficient outcomes, a principle later extended by Posner to legal systems. While EMH provides a useful framework, real markets often deviate due to information gaps, transaction costs, and behavioural biases, limiting the predictive power of EMH.

[429] O. Andriychuk, 'The Concept of Perfect Competition as the Law of Economics: Addressing the Homonymy Problem' (2011) 62(4) *Northern Ireland Legal Quarterly* 523-538. D. Langevoort, 'Theories, Assumptions, and Securities Regulation: Market Efficiency Revisited' (1992) 140 *University of Pennsylvania Law Review* 851 – 920. R. Coase, *The Firm, the Market and the Law* (Chicago, University of Chicago Press 1988) 52.
[430] R. Posner, 'An Economic Approach to Legal Procedure' (1973) 2(2) *Journal of Legal Studies* 299. R. Coase, 'The Problem of Social Cost' (1960) 3 *Journal of Law and Economics* 1.

Regulatory intervention seeks to reduce the imbalance when actual outcomes do not align with intended predictions and when self-correcting forces can no longer restore market equilibrium.[431] A relevant practical example to this research is where markets exhibit information asymmetry. As a consequence of information asymmetry, model assumptions no longer hold true in practice. Hence, an understanding of information-based model assumptions and the connection between information-based model assumptions and mandatory disclosure is vital to this research.

Although many models could be chosen to understand the theoretical basis for the role of information in the markets,[432] this part specifically reviews two primary models and their underlying information-based assumptions. The reason for selecting the CAPM and EMH models is threefold. Firstly, the CAPM and the EMH are the two most recognised and cited modern finance theory models which seek to intellectually explicate capital market forces.[433] Secondly, these models explain systematic, or market, risk and how markets operate efficiently. The assumptions of such models are clearly of interest to research into systemic risk and potential disorder, inefficiencies, or failings in hedge funds' leveraging practices.[434] Thirdly, these two models are heavily reliant on information-based assumptions.[435]

The CAPM explains the relationship between systematic risk and the expected return of a particular stock. Systematic risk is the risk inherent in the entire market, that is, the 'market

[431] FSA, 'The Turner Review: A Regulatory Response to the Global Banking Crisis' (2009) 87.
[432] The main modern finance theories are the Capital Asset Pricing Model (CAPM), the efficient market hypothesis (EMH), the Modigliani-Miller theorems (M&M) and the Black- Scholes-Merton model (BSM). See M. Miller, 'The Modigliani-Miller Propositions After Thirty Years' (1988) 2(4) *Journal of Economic Perspectives* 99. A. Bick, 'On the Consistency of the Black-Scholes Model with a General Equilibrium Framework' (1987) 22(3) *Journal of Financial and Quantitative Analysis* 259.
[433] P. O'Sullivan, 'The Capital Asset Pricing Model and the Efficient Markets Hypothesis: The Compelling Fairy Tale of Contemporary Financial Economics' (2018) 47(3) *International Journal of Political Economy* 225.
[434] Laura Garcia-Jorcano, Lidia Sanchis-Marco, 'Systemic-Systematic Risk in Financial System: A Dynamic Ranking Based on Expectiles' (2021) 75 *International Review of Economics & Finance* 330.
[435] O'Sullivan, *supra* note 22, 235.

risk' that a portfolio cannot diversify out of. This systematic risk is closely connected to systemic risk, that is, the risk that a failure of a market participant or sector may impact the entire economy.[436] Although this model is based on several information-based assumptions, the aim of the model is to assess the impact of adding another security to a portfolio. Therefore, it validates the importance of information, but the model does little to address the overall functioning of the market. By comparison, the EMH does address the efficient and orderly functioning of the market. It is therefore the model that this section will particularly focus on.

The CAPM is of importance, but, as will be evaluated within this part, the CAPM can be considered as being less directly applicable to the analysis of market failure.[437] The EMH model will be considered, and extensively referred to, as the most appropriate model for understanding the elements of an effective and stable market.[438]

3.3.1.1. Capital Asset Pricing Model

Until the 1960s, investors did not have a model for explicating several aspects relating to market forces: adjusting the expected return of a diversified portfolio resulting from the inclusion of an additional security, the element of market risk that could not be diversified out of, or the passage of time. The CAPM was introduced by several authors over decades of refinements to link risk and return within portfolios as a theoretical model that could solve this problem.[439] The CAPM determines if a stock price is correctly valued in light of its risk,

[436] W. Sharpe, 'Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk' (1964) 19(3) *The Journal of Finance* 425.
[437] *Ibid*.
[438] E. Fama, 'Efficient Capital Markets: A Review of Theory and Empirical Work' (1970) 25 *The Journal of Finance* 383.
[439] E. Fama and K. French, 'The Capital Asset Pricing Model: Theory and Evidence' (2004) 18(3) *The Journal of Economic Perspectives* 25.

expected return, market risk and passage of time. The CAPM formula represents the relationship between risk and expected return.[440] The greater the risk, the less valuable a security becomes as an addition to a diversified portfolio.[441] The reverse is also true. Put simply, the objective of the CAPM is to determine if adding another stock to a portfolio would deliver a sufficient additional return to validate the increased level of risk that the portfolio would assume.

According to Fama and French, the CAPM is based on key assumptions, including: (1) all transactions in the market are costless, (2) every investor acts rationally to maximise their wealth, (3) every investor acts uniformly and simultaneously, (4) every investor is equally informed and sophisticated, and (5) information is processed and valued efficiently by the marketplace.[442] The information-based assumptions of the CAPM are predicated on market participants being equally informed and that the market has a process to ensure that such information is equally valued.

According to Kahneman and Tversky's prospect theory, the rationality assumption is open to criticism on the grounds that although investors are theoretically loss-averse or wealth-maximising, they are also susceptible to cognitive biases such as overconfidence, herding, and anchoring that often result in behavioural patterns termed as irrational. [443] Hence, investors do not always utilise information in the same way. Rather, utilisation can be viewed as a spectrum with the endpoints of rational and irrational use. The CAPM foundational assumption that all users are at the rational end of the spectrum is flawed.

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[440] J. Glaser, 'Capital Asset Pricing Model: Risk Valuation Judicial Interpretation, and Market Bias' (1995) 50(2) *Business Lawyer* 687-716.
[441] *Ibid*. Also, see Sharpe, *supra* note 25.
[442] Fama and French, *supra* note 28.
[443] D. Kahneman, and A. Tversky, 'Prospect Theory: An Analysis of Decision under Risk' (1979) 47(2) *Econometrica* 263.

An extension of this rationality assumption is that investors act uniformly and simultaneously when information is available to the market. This is not a practical assumption. Market participants have different strategies, triggers, risk tolerances, access to capital, and investment time horizons. The market is more aptly characterised as heterogeneous rather than homogeneous. In fact homogeneity is more likely to align with the potential for market instability.

These assumptions serve to explain diversification practices, in conjunction with reduced risk, in order to achieve a positive return. For example, a hedge fund may keep adding securities to a diversified portfolio, but only as long as the amount of risk is minimised, whilst the expected level of return is still achieved.[444] However, the assumptions also offer insights into the relationship between information and efficient markets.[445] The CAPM can only operate if the market is informationally efficient in terms of production, distribution, availability, and rational use in decision-making.[446] Put another way, if the information is unavailable to all market participants, a disorderly or inefficient market could result.

This foundational CAPM assumption of perfect information is problematic from the perspective that investors do not access, interpret, and use information simultaneously and in the exact same way. Grossman and Stiglitz address this weakness in their seminal research on this issue. They concluded that some degree of informational inefficiency in a market is necessary, as perfect information results in investors refusing to pay for information, as it is

[444] Glaser, *supra* note 29, 693.
[445] William F Sharpe and John Lintner are credited with developing the capital asset pricing model. See Sharpe, *supra* note 25.
[446] J. Gordon and L. Kornhauser, 'Efficient Markets, Costly Information, and Securities Research' (1985) 60 *NYU Law Review* 761. Production of information refers to the gathering of relevant data. Distribution of information refers to the communication of data to buy-side and/or sell-side market participants. Availability of information refers to both public and inside information being accessible. Rational use of information refers to investor expectations and associated actions being predictable.

assumed to be costless, and this is not how markets work in reality. [447] This is evidenced by the fact that it is industry standard for professional investors, such as hedge funds, to purchase research and proprietary data on an ongoing basis to support and inform their investment strategy and execution. This behaviour would be viewed as economically irrational if information were truly costless and universally available as CAPM assumes.

At its essence, the CAPM focuses on assessing a stock's price and its relative suitability to be added to a portfolio. The purpose of the CAPM is not to make comprehensive assessments about overall market efficiency. For this thesis' analysis, it is therefore necessary to review the EMH, which is a closer fit for research on systemic risk because of the EMH's wider view on market efficiency and stability.

3.3.1.2. Efficient Markets Hypothesis

The EMH is a model that states that security prices reflect all available information, making it impossible for any security to be over- or undervalued.[448] The foundational premise of the EMH model is that an efficient market is one in which all market participants have equal access to all price-related information, and all market participants are rational and profit-maximising in their decision-making.[449] The main overlapping feature of CAPM and EMH is that of investor rationality in responding to the information provided by the market. However, as elaborated on below, the assumption of rationality is perhaps one of the most

[447] S. Grossman and J. Stiglitz, 'On the Impossibility of Informationally Efficient Markets' (1980) 70(3) *American Economic Review* 393.
[448] E. Fama, 'Random Walks in Stock Market Prices' (1965) 21 *Financial Analysts Journal* 55. E. Fama, 'Efficient Capital Markets: II' (1991) 46 *The Journal of Finance* 1575.
[449] C. Saari, 'The Efficient Capital Market Hypothesis, Economic Theory and the Regulation of the Securities Industry' (1977) 29(5) *Stanford Law Review* 1031. E. Fama, 'Efficient Capital Markets: A Review of Theory and Empirical Work' (1970) 25 *The Journal of Finance* 384. S. Deakin, 'The Evolution of Theory and Method in Law and Finance' in N. Moloney, E. Ferran, and J. Payne (eds), *The Oxford Handbook of Financial Regulation* (OUP 2015) 18.

criticised aspects of modern finance theories and their application to markets during a crisis.[450]

The EMH's focus on the overall orderly functioning of markets is discerned especially by Fama. Although Fama is not the original author of the EMH theory, he is credited with much of the seminal work in this area since the 1970s.[451] Fama recognised that a single assumption of complete informational efficiency was not practical and he distinguished between "random walks" and "fair games", based on how fully information was reflected in security prices.[452] The fully informed price of each security would be the determining force of efficient resource allocation within the market.[453] This is what Fama referred to as "fair game." A "random walk" was a scenario where informational efficiency was less than full.

Fama stipulated three overarching degrees of market efficiency in the pricing of a security which is being traded in financial markets: weak form, semi-strong form, and strong form.[454] The difference between each form is that the first form includes no information, the second only contains information which is publicly available, and the third reflects all information in the security price, including inside information.[455] Built into these forms of efficiency are assumptions around the adequacy of the information,[456] its timeliness,[457] and the rationality of the party seeking to rely on the information.[458]

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[450] R. Ball, 'The Global Financial Crisis and the Efficient Market Hypothesis: What Have We Learned?' (2009) 21(4) *Journal of Applied Corporate Finance* 8.
[451] E. Fama, 'Efficient Capital Markets: A Review of Theory and Empirical Work' (1970) 25 *The Journal of Finance* 383.
[452] *Ibid*., 389.
[453] *Ibid*., 384.
[454] *Ibid*.
[455] M. Gillen, 'Capital Market Efficiency Assumptions: An Analytical Framework with an Application to Disclosure Laws' (1994) 23(3) *Canadian Business Law Journal* 346.
[456] I. Akintoye, 'Efficient Market Hypothesis and Behavioural Finance: A Review of Literature' (2008) 7(2) *European Journal of Social Science* 15.
[457] R. Ball, 'The Global Financial Crisis and the Efficient Market Hypothesis: What Have We Learned?' (2009) 21(4) *Journal of Applied Corporate Finance* 13.
[458] A. Lo, 'Efficient Markets Hypothesis' in S. Durlauf and L. Blume (eds), *The New Palgrave: A Dictionary Of Economics* (2nd edn, Palgrave Macmillan 2007).

However, Fama's strong form assumptions are not practical. For example, inside information is assumed to be reflected in price. Even the semi-strong informational efficiency assumptions have been challenged on the basis that markets do not really react simultaneously to new publicly available information.[459] They do not represent a true reflection of market dynamics or participant behaviour.

Information is the key variable in market efficiency. Under this model, price reflects all available information in the market. The available information is assumed to be complete, timely in how it is reflected in security prices, and rationally and uniformly used by investors.[460] This thesis proposes that there are several assumptions which encapsulate the model's efficiencies. Firstly, information-production efficiency relates to information being efficiently produced and disseminated to all decision-makers. Secondly, fundamental-valuation efficiency provides that differences in the fundamental value of securities will be exploited immediately once information is disseminated. Thirdly, adjustment efficiency signifies that stock prices adjust quickly after information is disseminated.[461]

This assumption that information is complete, timely, and uniformly acted upon is only theoretical. Information production, transfer, analysis, structuring, and interpretation all cost. This is one of the fundamental flaws in the assumption of the EMH. Furthermore, these stages cannot occur simultaneously. Market friction, liquidity constraints, regulatory delays,

[459] M. Leković, 'Evidence for and Against the Validity of Efficient Market Hypothesis' (2018) 56(3) *Economic Themes* 369.
[460] E. Fama, 'Efficient Capital Markets: A Review of Theory and Empirical Work' (1970) 25 *The Journal of Finance* 383.
[461] D. Langevoort, 'Theories, Assumptions, and Securities Regulation: Market Efficiency Revisited' (1992) 140(3) *University of Pennsylvania Law Review* 851.

required trading approvals, and any number of additional factors make it impossible in reality.

The fundamental problem with the application of the EMH model, and its underlying assumptions, is that EMH provides that all new information in the market is reflected in security prices. In effect, all investors should act predictably through rationally homogeneous decision-making and should uniformly benefit from available information.[462] As recognised by Burton Malkiel, this is not a practical assumption as investors make decisions which are based upon many heterogeneous considerations and biases.[463]

However, it is difficult to accept this assumption of rational homogeneous decision-making when in practice investors often demonstrate systematic cognitive bias, according to behavioural finance theory.[464] Investors are often overconfident, subject to a proclivity to take mental shortcuts, and suffer from confirmation bias.[465] This leads them to act irrationally.

Another fundamental flaw is that the EMH assumes that the market always remains efficient and requires minimal regulatory intervention as the market self-corrects.[466] However, even if theory suggests that a market self-corrects or self-regulates, this research analyses the theoretical propositions in order to set the basis upon which the proposals of the thesis are

[462] B. Malkiel, 'The Efficient Market Hypothesis and Its Critics' (2003) 17(1) *Journal of Economic Perspectives* 72.
[463] *Ibid*.
[464] Kahneman and Tversky, *supra* note 32. Also, N. Barberis, 'Psychology-Based Models of Asset Prices and Trading Volume' in B. Bernheim, S. DellaVigna and D. Laibson (eds), in Handbook of Behavioral Economics: Foundations and Applications (vol 1, Elsevier 2018) 79.
[465] J. Kumar and N. Prince, 'Overconfidence Bias in Investment Decisions: A Systematic Mapping of Literature and Future Research Topics' (2023) *FIIB Business Review* 1; S. Kumar and N. Goyal, 'Behavioural Biases in Investment Decision Making: A Systematic Literature Review' (2015) 7(1) *Qualitative Research in Financial Markets* 88; A. Tversky and D. Kahneman, 'Judgment under Uncertainty: Heuristics and Biases' (1974) 185(4157) *Science* 1124.
[466] R. Nunes, 'The Efficient Market Hypothesis as an Extension of Neoclassical Theory: A Theoretical and Empirical Critique' (2025) 7 *Journal of Economics, Finance and Accounting Studies* 117.

made. In practice, regulatory intervention has become a priority within financial markets. The EMH also ignores the possibility that, in practice, analyses of securities issuers can lead to excess returns, above the market median, for parties with different decision-making processes.[467] Further, the EMH ignores the possibility that different parties to the same transaction may have different levels of information and that such information asymmetry, or unequal bargaining positions, may create price and market instability.[468] Therefore, there is a clear divergence between the information-based assumptions of the EMH and how the assumptions hold true in practice.

The assumption that the EMH contains an internal capability for the market to self-correct is particularly troublesome. An assumption that effectively means that no external correction is required *de facto* means that no regulatory intervention is ever required to bring about a state of market equilibrium. However, the global financial crisis proved that this assumption is incorrect as markets were not able to self-correct. This is a very important point to make for this thesis as it opens the door to the recommendations that this research will make. If informational inefficiency feeds systemic risk and the market cannot self-correct, then external correction in the form of informational-based market intervention is required.

As was the case in the CAPM, it is clear from the assumptions of the EMH that informational efficiency is the crucial element of an efficient market. Market failure is a potential outcome of an absence of information which is complete, timely, and conducive to decision-making. Information would not be produced in a manner to facilitate investor decision-making. Investors would not have sufficient or timely information to make appropriate or rational decisions. Hence, prices of securities in the market would not adjust efficiently. This is what

[467] B. Malkiel, 'The Efficient Market Hypothesis and Its Critics' (2003) 17(1) *Journal of Economic Perspectives* 59.
[468] *Ibid*., 62.

would constitute a market failure.[469] Arguably, this manner of market failure can only be combatted by first reducing the informational inefficiency.

3.3.2. Disclosure and market failure

There are many explanations of the term 'market failure'. A widely held view is that, as an economic concept, market failure epitomises the inefficient distribution of goods and services, largely due to informational inefficiency, within supposedly free and competitive markets.[470] This section will address the connection between disclosure and the prevention of market failure. To assist this analysis, an application of the EMH to salient features of the financial crisis will be undertaken. In accomplishing this objective, this section will be broken into three sub-sections. Firstly, there will be an evaluation of the extent to which the assumptions of the EMH hold true in practice. Secondly, there will be an assessment of voluntary disclosure and its appropriateness for identifying and combatting market failure. Thirdly, there will be an assessment of mandatory disclosure's role in reducing the information-based inefficiencies that can result in market failure.

3.3.2.1. Weaknesses of the EMH in a crisis context

Pre-crisis financial regulation was firmly rooted in, and shaped by, the intellectual framework of modern finance theory.[471] According to Gilson and Kraakman in their analysis of

[469] R. Mihalache and D. Bodislav, 'Government Failure vs. Market Failure. The Implications of Incomplete Information' (2019) 16(2) *Theoretical and Applied Economics* 91. X. Landes and P. Néron, 'Morality and Market Failures: Asymmetry of Information' (2018) 49(4) *Journal of Social Philosophy* 564. P. Barbaroux, 'From Market Failures to Market Opportunities: Managing Innovation under Asymmetric Information' (2014) 3(1) *Journal of Innovation and Entrepreneurship* 1.
[470] For example, see T. Islam, 'Market Failure: Reasons and Its Accomplishments' (2019) 5(12) *International Journal of Economics and Financial Research* 2413.
[471] C. Duffin-Hall, 'Are the Lessons from the Financial Crisis on Using Modern Finance Theory as the Intellectual Framework for Financial Regulation Reflected in Post-Crisis Regulation' (2019) 8 *UCL Journal of Law and Jurisprudence* 92.

informational and fundamental market efficiency prior to the financial crisis, regulatory policymaking arguably operated based on a light-touch approach whereby investor rationality and informational efficiency within markets were assumed to be valid operational assumptions.[472] As discussed above, informational efficiency is central to the EMH. In the years prior to the crisis, regulators maintained the perspective that focusing regulatory change on disclosure would be a way to impact the behaviour of market participants without intervening in the market. Disclosure would provide the information necessary to feed the forces of allocative efficiency within the market. In essence, once a regulator mandated the production and dissemination of information, the market would automatically implement what was necessary to become efficient, to self-regulate, and to self-correct.[473]

As outlined in the Turner Report,[474] this assumption did not hold true in practice for many reasons. Firstly, market efficiency does not always mean that all market participants act rationally. Secondly, there is a difference between individual rationality and collective rationality. Thirdly, behaviour is not always rational. Fourthly, there are limits to additional allocative efficiency because, at a certain point being reached, all the goods and services demanded by the market will have been produced and allocated. Fifthly, markets tend to suffer from herding.[475] Therefore, the assumptions of efficient market theory have not proven effective in preventing market failure.[476]

The inadequacies of the EMH are visible in the kinds of market behaviours which culminated in the financial crisis. Firstly, herding by market participants is an example of changing

[472] R. Gilson and R. Kraakman, 'Market Efficiency after the Financial Crisis: It's Still a Matter of Information Costs' (2014) 100(2) *Virginia Law Review* 313.
[473] Duffin-Hall, *supra* note 60, 97-98.
[474] FSA, 'The Turner Review: A Regulatory Response to the Global Banking Crisis' (2009); available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20090320232953/http://www.fsa.gov.uk/pubs/other/turner_review.pdf (date accessed: 4 January 2026).
[475] *Ibid*., 40-41.
[476] *Ibid*., 45.

behaviour patterns among investors when information availability gives way to following the crowd.[477] This directly challenges assumptions concerning the rationality of investors. The EMH suggests that over- or undervalued securities would be impossible because rational arbitrageurs would correct the price anomaly which would be created by herding. However, this did not happen in the period prior to the financial crisis.

Secondly, as set out in Minsky's seminal work, markets may tend to lean towards instability and crisis in what is now called the financial instability hypothesis.[478] This theory investigates the influence of rising debt levels on systemic behaviour within financial markets. It challenges the assumptions of the EMH by arguing that markets do not consistently internalise lessons from past disruptions or debacles. Over time, this inability diminishes market resilience, increasing the likelihood of periodic financial crises.[479]

Thirdly, the micro-prudential approach to regulation, as promoted by the EMH prior to the crisis, was inadequate because strengthening individual firms was not a guarantee of strength for the entire financial system. For example, if every firm were to simultaneously deleverage its portfolio, it might be beneficial for individual firms, but it could be destabilising at a macro level for the market.[480] Prior to the crisis, the regulatory focus was on micro-prudential rules.[481] This left the macro stability of the financial system exposed to market forces, which represented a regulatory failure on top of a market failure.[482]

[477] Duffin-Hall, *supra* note 60, 108.
[478] H. Minsky, *Stabilizing an Unstable Economy* (NY, McGraw-Hill 2008) 11.
[479] Duffin-Hall, *supra* note 60, 112.
[480] *Ibid*., 114.
[481] *Ibid*., 121.
[482] *Ibid*., 123.

3.3.2.2. EMH and regulation

According to Enriques and Gilotta, who addressed mandatory disclosure from an investor protection perspective rather than from a financial stability perspective, the lessons to be learned from applying any modern finance theory to pre-crisis regulatory rules are: (1) the rationality of market participants cannot be assumed. Therefore, the assumption that the market self-regulates, based on the actions of rational investors, restoring efficiency to the market, while leaving little to be supervised, is incorrect; (2) information should not only be mandatorily disclosed to investors for the purposes of investor protection, but should also be disclosed appropriately to regulators for the purposes of actively ensuring financial stability at a macro-level; and (3) information-based macro-prudential regulation facilitates supervisors with standardised actionable intelligence to ensure the type of market stability that the EMH was mistakenly assumed to deliver. This is the heart of the connection between the EMH and regulation – regulatory intervention is necessary because the theoretical position that a market self-corrects or self-regulates is inaccurate. Arguably, these inadequacies of the EMH model reflect the very reason for regulators introducing mandatory disclosure with structured supervisory oversight.[483]

The impact of the EMH on pre-crisis regulation, through the acceptance by regulators of its assumptions, was that there was increased impetus towards deregulatory measures. The informational efficiency assumption, as epitomised by EMH, was being given an increasingly wide application. Gilson and Kraakman state that:

> 'ECMH was hijacked by a powerful political clientele during the Reagan era, if not before, and was transformed, at least in the eyes of the public, from a narrow but

[483] L. Enriques and S. Gilotta, 'Disclosure and Financial Market Regulation' in Niamh Moloney, Eilís Ferran, and Jennifer Payne (eds), *The Oxford Handbook of Financial Regulation* (Oxford, OUP 2015), 520-525.

important academic theory about the informational underpinnings of market prices into a broad ideological justification for preferring market outcomes over regulation. In this sense, the ECMH was itself the subject of an artificial bubble.'[484]

Therefore, regulators focused on micro-prudential regulatory intervention at the firm level, rather than regulating at the macro, or system-wide, level.[485] Regulators aimed to protect individual investors and regulated firms, and not the financial stability of the market, as this was the built-in assumption of the EMH.[486] This stability, along with the market's ability to self-regulate and to find an equilibrium efficiency point, was assumed to be by-products of the EMH if: (1) market participants were given all available information and (2) all individual institutions were stable.[487]

Many regulators have been vocal about this misplaced trust in economic assumptions of market efficiency. In the aftermath of the financial crisis, Martin Wheatley, the then Head of Consumer and Markets Business Unit at the UK Financial Services Authority (FSA), said that this flawed intellectual reasoning needed to be turned on its head. The then chairman of the FSA and author of the Turner Review on the financial crisis, Lord Adair Turner, said that '[t]he pre-crisis delusion was that the financial system, subject to the then defined rules, had an inherent tendency towards efficient and stable risk dispersion.'[488] EMH was criticised because the availability of information was not translating into predictable market participant behaviour. Specifically, market participants were exiting the OTC and derivative markets

[484] R. Gilson and R. Kraakman, 'Market Efficiency after the Financial Crisis: It's Still a Matter of Information Costs' (2014) 100(2) *Virginia Law Review* 315.
[485] S. Hanson, A. Kashyap and J. Stein, 'A Macroprudential Approach to Financial Regulation' (2011) 25(1) *Journal of Economic Perspectives* 3.
[486] FSA, 'The Turner Review: A Regulatory Response to the Global Banking Crisis' (2009) 87.
[487] R. Mokal, 'Liquidity, Systemic Risk, and the Bankruptcy Treatment of Financial Contracts' 10 *Brooklyn Journal of Corporate, Financial & Commercial Law* 21. C. Borio, 'Rediscovering the Macroeconomic Roots of Financial Stability Policy: Journey, Challenges, and a Way Forward' (2011) 3 *Annual Review of Financial Economics* 88.
[488] I. Moosa, *Contemporary Issues In The Post-Crisis Regulatory Landscape* (World Scientific Publishing Company 2016) 126. P. O'Regan, *Financial Information Analysis: The Role of Accounting Information in Modern Society* (3rd edn, Routledge 2015) 81.

rather than trading based on available information. Therefore, regulators, industry and academia viewed EMH as a 'casualty' of the financial crisis, because its assumptions about information being connected to efficiency did not hold true in practice.[489]

In summary, when assessing the weaknesses of the EMH, the global financial crisis showed that the absence of informational efficiency can potentially lead to disorderly markets and, ultimately, to market failure. Therefore, disclosure should reduce this inefficiency.

3.3.3. Disclosure regimes

There are many incentives for information disclosure. It can be seen as a public good and should be regulated. Externalities, or the imperfect availability of information, are eradicated by ensuring that all parties have access to all information. A strong rationale for regulatory intervention is the problem of agency, whereby managers' interests differ from those of investors. A further significant rationale for regulatory intervention is to ensure standardisation of information, so that investors can understand the information being disclosed.[490] However, according to Enriques and Gilotta, the problem with disclosure – in all its forms – is that few rationales for regulatory intervention, if any, give guidance on how to design a disclosure-based model. Moreover, there is little guidance provided on what exactly should be disclosed.[491] Enriques and Gilotta argue that this can lead to ill-designed rules and create a high cost to those who are required to disclose.

[489] *Ibid*.
[490] L. Enriques and S. Gilotta, 'Disclosure and Financial Market Regulation' in Niamh Moloney, Eilís Ferran, and Jennifer Payne (eds), *The Oxford Handbook of Financial Regulation* (Oxford, OUP 2015), 520.
[491] *Ibid*., 525.

There are generally two alternative information-based regimes that are available to a regulator when intervening in the market – a voluntary disclosure regime and a mandatory disclosure regime. In the interests of completeness, it is necessary for this research to firstly address voluntary disclosure regimes and briefly explain why voluntary disclosure is not the most appropriate way to intervene in relation to a market failure such as the global financial crisis. A brief review of the features of a mandatory disclosure regime will subsequently be undertaken.

3.3.3.1. Voluntary disclosure

This sub-section will seek to identify important characteristics of voluntary disclosure, as utilised in different areas of compliance beyond the regulation of hedge fund activities. The purpose of the sub-section will be to establish voluntary disclosure's suitability in identifying and combatting information-based market failures more broadly, not only in respect of hedge funds.

Voluntary disclosure is most commonly associated with two primary areas. Firstly, there can be voluntary disclosure by supply-side market participants to demand-side customers and other market participants. This can include transparency of corporate governance structures, or environmental, social and governance (ESG) issues, or transparency with customers or investors concerning risks to which they are exposed.[492] Such voluntary disclosures are found in annual financial reports and specific disclosure documents. These voluntary regimes can be broken into two sub-categories. One example is where entities are subject to the 'comply or explain' requirement, meaning that any instance of non-compliance must be accompanied

[492] R. Boateng, V. Tawiah, and G. Tackie, 'Corporate Governance and Voluntary Disclosures in Annual Reports: A Post-International Financial Reporting Standard Adoption Evidence From an Emerging Cpital Market' (2022) 30(2) *International Journal of Accounting & Information Management* 252.

by a formal explanation to the regulator. Those entities not subject to this requirement are not obligated to provide such justification.[493]

The purely voluntary regime, such as those found in self-regulatory frameworks, is the more uncommon and has low levels of reporting.[494] The 'comply or explain' version of voluntary disclosure is not without its own criticisms and limitations. Most notably, Ho refers to: (1) voluntary disclosure being usually focused on qualitative rather than quantitative metrics; (2) the purpose of 'comply or explain' being the use of the threat of reputational damage to market participants in order to compel disclosure and to inform investors. The purpose is not to ensure financial stability; (3) it is only through an auditing process that voluntary disclosures can be validated and assured; and (4) the timing and consistency of such reporting significantly varies.[495]

The 'comply or explain' voluntary disclosure approach has been adopted within EU financial services regulation through the Sustainable Finance Disclosure Regulation (SFDR).[496] Article 4(1)(a) gives market participants the ability to disclose on their websites any factors that they consider as having a principal impact on sustainability. ESMA found in a 'one year on' survey of national competent authorities regarding this voluntary disclosure regime that the level of compliance across EU member states varied significantly.[497] The resulting implication of such significant variance – reinforcing the criticisms offered by Ho – is that a

[493] V. Harper Ho, ''Comply or Explain' and the Future of Nonfinancial Reporting' (2017) 21(2) *Lewis & Clark Law Review* 318.
[494] J. Short and M. Toffel, 'Making Self-Regulation More Than Merely Symbolic: The Critical Role of the Legal Environment' (2010) 55(3) *Administrative Science Quarterly* 361.
[495] *Ibid.*, 326-327.
[496] For example, see Article 4(1)(a) of Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability‐related disclosures in the financial services sector, [2019] OJ L317/1.
[497] Joint ESAs' Report on the extent of voluntary disclosure of principal adverse impact under the SFDR, p. 5, 28 July 2022; available at: https://www.esma.europa.eu/sites/default/files/library/jc_2022_35_-_joint_esas_report_on_the_extent_of_voluntary_disclosures_of_pai_under_sfdr.pdf (date accessed: 4 January 2026).

voluntary disclosure regime is not appropriate for supporting decisions about identifying and combatting information-based market failure because of the lack of complete data.

Secondly, voluntary disclosure can be made by a market participant to a regulator. However, the nature of this type of disclosure is to allow market participants to raise an error on their part to a regulator concerning previously submitted reports. Such examples can be observed in voluntary disclosure rules of tax authorities or financial regulators to enable the resubmission of financial statements that assess tax liability.[498]

For the purposes of this thesis, it can be argued that this type of voluntary disclosure is not suitable for identifying and combatting market failure. The voluntary disclosure approach places the onus on an individual market participant to report an error. Voluntary disclosure is not therefore, focused on market-wide risks. The voluntary disclosures of individual market participants cannot necessarily be aggregated with those of other participants. The only aggregation that takes place is to deliver an aggregate view of reported errors to the program supervisor.[499] For example, if several financial institutions voluntarily report calculation errors in their own trading data, the regulator may compile these into a summary showing how many errors were reported overall. However, this summary would not analyse whether similar errors occurred across the market as a whole or indicate a systemic risk in the market.

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[498] D. Benedek, M. Grote, G. Jackson, M. Markevych, L. Sofrona and C. Waerzeggers, 'Voluntary Disclosure Programs — Design, Principles, and Implementation Considerations' (2022) International Monetary Fund Technical Note and Manual 22/01; available at: https://www.imf.org/-/media/Files/Publications/TNM/2022/English/TNMEA2022002.ashx (date accessed: 4 January 2026). Also, see Organisation for Economic Co-operation and Development (OECD), 'Offshore Voluntary Disclosure — Comparative Analysis, Guidance and Policy Advice' (2010); available at: https://www.oecd.org/ctp/exchange-of-tax-information/46244704.pdf (date accessed: 4 January 2026).

[499] D. Benedek, M. Grote, G. Jackson, M. Markevych, L. Sofrona and C. Waerzeggers, 'Voluntary Disclosure Programs — Design, Principles, and Implementation Considerations' IMF Technical Notes and Manuals TNM/2022/002, 21; available at: https://www.google.ie/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjN6arml-_6AhUrQ0EAHXpPBlwQFnoECA0QAQ&url=https%3A%2F%2Fwww.imf.org%2F-%2Fmedia%2FFiles%2FPublications%2FTNM%2F2022%2FEnglish%2FTNMEA2022002.ashx&usg=AOvVaw2KCblpTNYDLQC4Sm2Kong6 (date accessed: 4 January 2026).

As a consequence, wider views of the market cannot be sufficiently attained through this category of reporting. Arguably, a mandatory disclosure regime is a more suitable mechanism to identify and combat market failure.

3.3.3.2. Mandatory disclosure

Mandatory disclosure is a key foundational tool in the regulation of financial services.[500] In combatting market failures, mandatory disclosure supports three broad objectives. Firstly, mandatory disclosure protects investors and creates confidence in the marketplace.[501] This is especially important in any market of institutional and retail investors. Secondly, mandatory disclosure ensures that agency costs are minimised by making corporate governance arrangements transparent. A firm's management structure will be much more likely to act in a way that it 'should', if the firm is under an obligation to disclose data.[502] Thirdly, mandatory disclosure influences market pricing and the efficient functioning of financial markets. Volatility, liquidity, cost of capital and financial stability are all linked to price accuracy.[503] Policymakers internationally, and within the EU, have set mandatory disclosure as a staple in the pursuit of investor protection and financial stability outcomes.[504]

Mandatory disclosure can be categorised as either public or private.[505] Public disclosure refers to information which is disclosed to the market, whereas private disclosure refers to

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[500] L. Enriques and S. Gilotta, 'Disclosure and Financial Market Regulation' in N. Moloney, E. Ferran, and J. Payne (eds), *The Oxford Handbook of Financial Regulation* (Oxford, OUP 2015) 512.
[501] J. Seligman, 'The Historical Need for a Mandatory Corporate Disclosure System' (1983) 9 *The Journal of Corporation Law* 1.
[502] M. Fox, 'Required Disclosure and Corporate Governance' (1999) 62 *Law and Contemporary Problems* 113, 118-20.
[503] Enriques and Gilotta, *supra* note 89, 519.
[504] O. Ben-Shahar and C. Schneider, 'The Failure of Mandated Disclosure' (2011) 159 *University of Pennsylvania Law Review* 647, 681-4.
[505] J. Daníelsson, A. Taylor, JP. Zigrand, 'Highwaymen or Heroes: Should Hedge Funds be Regulated?: A Survey' (2005) 1(4) *Journal of Financial Stability* 522.

information disclosed to the regulator.[506] Public disclosure facilitates market discipline and investor protection by requiring the timely and accurate release of information concerning an entity or security.[507] Private disclosure facilitates the provision of information to regulatory authorities, who can then make decisions surrounding market intervention.[508]

The argument for mandatory disclosure is based on alleviating the likelihood of market failure, specifically through mandating the disclosure of standardised data sets by market participants to a regulator. Of importance to this research is systemic market failure, where regulators must understand the market's interconnectedness, resulting from how firms are linked to one another through their trades and risk exposures.[509] Therefore, regulators need to ensure that they have access to the necessary data sets that will allow them to understand emerging risks from traded products and the emerging risks with the counterparties that trade the products. In assessing this potential for emerging risks, exposure and concentration information must be mandatorily disclosed to a regulator for the purpose of aggregation across the market. This will enable the identification of institutions with similar exposures and concentrations.[510] It will facilitate an understanding of the risk-based relationship between these connected market participants. However, regulators face significant challenges in determining the information required to effectively supervise the market and to ensure that any burgeoning market failure is identified and combatted.[511]

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[506] *Ibid*.
[507] I. Goldstein and L. Yang, 'Information Disclosure in Financial Markets' (2017) 9 *Annual Review of Financial Economics* 101.
[508] S. Kothari, 'The role of financial reporting in reducing financial risks in the market' (2000) 44 Conference Series 89-112; available at: https://www.bostonfed.org/-/media/Documents/conference/44/cf44_6.pdf (date accessed: 4 January 2026).
[509] H. Allen, 'A New Philosophy for Financial Stability Regulation' (2013) 45 *Loyola University Chicago Law Journal* 229.
[510] E. Becker, *Knowledge Capture in Financial Regulation: Data-, Information- and Knowledge-Asymmetries in the US Financial Crisis* (Berlin, Springer 2016).
[511] D. Awrey and K. Judge, 'Why Financial Regulation Keeps Falling Short' (2020) 61(7) *Boston College Law Review* 2295.

3.4. The relationship of mandatory disclosure to systemic risk

Before addressing the regulation of the hedge fund industry's systemic risk, the relationship between mandatory disclosure and systemic risk should be considered. Disclosure on its own does not identify or combat systemic risk. There has been some discussion in the aftermath of the global financial crisis as to whether disclosure-based regulatory intervention has resulted in a more stable and resilient financial system. Hasty or disproportionate regulatory intervention, public policy pressure, and regulation based on past risks have been cited as reasons for this.[512] Moreover, mandatory disclosure is not a behavioural control. Mandatory disclosure cannot, of itself, ensure the rationality of decision-making and the stabilising of disorderly or inefficient markets. In part 3.3, the focus is on the relationship between mandatory disclosure and systemic risk. To achieve this aim, there will be one section that focuses on defining the challenges that exist in this relationship.

3.4.1. Defining the challenge

This section will be divided into three sub-sections. Firstly, the section will introduce the idea of a financial system as opposed to a financial market. Viewing the market as a system helps understand the connection of the financial market to systemic risk. Secondly, the section will summarise the issue of interconnectedness as a key driver behind systemic risk. Interconnectedness between market participants arises from the transfer, accumulation and storage of risk. Understanding the causes of interconnectedness and the nature of the data to be disclosed is crucial to understanding systemic risk itself. The risk arising from interconnectedness can only be combatted by accurately structuring disclosed data. This data

[512] *Ibid*., 2300.

structuring is necessary to identify the counterparties, markets and security products where potential systemic risk exists. Without such structuring, the data may not be sufficient to support intervention in the market. Thirdly, the section will highlight key regulatory challenges in using mandatory disclosure regimes to derive such actionable intelligence. This actionable intelligence is vital to identifying and combatting systemic risk related to the interconnectedness arising from securities trading in the market.

3.4.1.1. *Financial markets as a system*

Neave outlines that all financial systems – meaning the financial system that operates in each country – are made up of the same three elements, but in different quantities or levels of importance. These three elements are markets, intermediaries, and internally provided financing.[513] 'Markets' encompass capital and money markets. 'Intermediaries' refer to financial institutions raising funds for lending or reinvesting. 'Internally provided financing' refers to private funding by one part of a private organisation to another to facilitate its activities.[514] The financial system essentially acts as a marketplace. It is an intermediary in the flow of money from depositors to borrowers and in the flow of capital from investors to securities issuers. This accessing of markets and intermediation is a mechanism for either raising funds or exchanging risk. Although many different trading instruments exist within the marketplace, all trading instruments serve these two fundamental purposes.

Prior to the 2000s, interconnectedness in the financial system was relatively straightforward. Banks and other financial intermediaries connected primarily through traditional lending and borrowing relationships. Systemic risk at this stage was largely contained within individual

[513] E. Neave, *Modern Financial Systems: Theory and Applications* (NJ, Wiley 2009) 9.
[514] *Ibid*., 29.

institutions or market segments, and regulators generally had sufficient information to monitor exposures and maintain financial stability.

During the early to mid-2000s, the financial system became increasingly complex. The rise of over-the-counter (OTC) derivatives, credit default swaps (CDS), collateralized debt obligations (CDO), and off-balance-sheet activities created a dense web of interconnected counterparties. Risks were dispersed across the system in a way that obscured their true location. This made it difficult to determine whether they were being transferred, diversified or concentrated. Information on trading volumes, leverage, liquidity, and exposures of market participants remained limited. Regulators lacked granular, uniform, and timely data to fully assess emerging systemic risks.

Applying this theory to the practical scenario of the financial crisis, it is clear that systemic risk developed around complex derivative products, trading in opaque markets, off-balance-sheet transactions, and firms deemed to be part of the shadow banking sector.[515] As OTC markets and complex products evolved, risks were dispersed into the market amongst counterparties in a web-like fashion. The interconnection of counterparties and the use of synthetic positions effectively camouflaged the true location of systemically important macro-prudential risks, such as credit risk or the institutional connections of counterparties trading them. By the late 2000s, immediately prior to the financial crisis, these interconnections had become highly opaque. Information on subprime loans was unreliable, undermining the assessment of CDS and CDO exposures. Hedge funds, connected as investors to banks and their derivative products, further embedded risk within the financial system. Regulatory authorities could not determine the concentration of risk, and the system became vulnerable to cascading failures.

[515] R. Johnston, E. Psalida, P. de Imus, J. Gobat, M. Goswami, C. Mulder, and F. Vazquez, 'Addressing Information Gaps' (2009) IMF Staff Position Note SPN/09/06; available at: https://www.imf.org/external/pubs/ft/spn/2009/spn0906.pdf (date accessed: 4 January 2026).

Prior to the 2010s, there was simply an absence of information needed to make decisions that could ensure financial stability.[516] Regulators could not tell therefore if the risk was being diversified by the market or being concentrated. There was an absence of granularity or uniformity of institutionally reported data needed to make these assessments, and to highlight these burgeoning risks. As well as information not existing, there was insufficient information on many factors, from trading volumes, the concentration of OTCs, liquidity, leverage levels, and exposure of non-banking financial institutions.[517] There was limited information on high-frequency trading of credit default swaps (CDS) and collateralized debt obligations (CDO). Unquantifiable false information on subprime loans accordingly invalidated the information on CDS and CDO risk exposure data concerning banks' combined on- and off-balance-sheet positions.[518] This lack of information contributed to systemic risk materialising within financial markets and to the failure of regulators to prevent it. With collapses such as Lehman Brothers and Bear Stearns, the interconnectedness of banks through their derivative trading positions and exposures was highlighted by academic commentary as being at the heart of this systemic threat.[519] Hedge funds were connected as investors to banks and their CDO and CDS products. Within this system, hedge funds acted as counterparties in financial transactions with banks.

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[516] Committee of European Banking Supervisors, 'CEBS Report on Banks' Transparency on activities and Products Affected by the Recent Market Turmoil' (2008); available at: https://www.lexology.com/library/detail.aspx?g=2d3f65a4-1d90-4bc9-8b5f-ece6f674c63a (date accessed: 4 January 2026). Counterparty Risk Management Policy Group, 'Containing Systemic Risk: The Road to Reform, Report III' (2008); available at: https://uk.practicallaw.thomsonreuters.com/4-382-9132?transitionType=Default&contextData=(sc.Default)&firstPage=true (date accessed: 4 January 2026).

[517] See non-exhaustive list of reports where information gaps have been highlighted by international institutions contained in IMF Staff Position Note, 'Addressing Information Gaps' (2009) SPN/09/06, 24; available at: https://www.imf.org/external/pubs/ft/spn/2009/spn0906.pdf (date accessed: 4 January 2026).

[518] IMF Staff Position Note, 'Addressing Information Gaps' (2009) SPN/09/06, 6; available at: https://www.imf.org/external/pubs/ft/spn/2009/spn0906.pdf (date accessed: 4 January 2026).

[519] H. Scott, 'Interconnectedness and Contagion' (2012) SSRN Electronic Journal; available at: https://www.aei.org/wp-content/uploads/2013/01/-interconnectedness-and-contagion-by-hal-scott_153927406281.pdf (date accessed: 4 January 2026).

As outlined by Kaufmann and Weber, the transparency requirements that are introduced in the aftermath of a financial crisis can eventually take on several objectives.[520] In the wake of learnings from the global financial crisis, Kaufmann and Weber advance a three-dimensional concept of transparency, as applied to financial regulation, to rebuild trust in the marketplace. The first dimension is the institutional aspect of procedures and decision-making. Transparency represents an anchor for financial regulation because of its ability to instil trust through the provision of legal certainty. The second dimension is that transparency provides the 'substantive backbone of financial regulation'. The third dimension is the imposition of accountability requirements on financial system actors in order to maintain confidence and trust in the financial system.[521]

The concept of being able to see is at the heart of rules on disclosure – being able to see where risk has been concentrated, who is being incentivised to take the risk, or if there is sufficient protection against the crystallisation of such a risk. In terms of being a supporting mechanism to financial stability, regulators use disclosure to compel firms to disclose information to enable risk to be identified and mitigated. What gives legitimacy to the disclosure is the purpose that disclosure serves.

3.4.1.2. Interconnectedness

For Edwin Neave, the functions referred to as the financial system include 'clearing and settlement, payments, pooling resources, acting as a store of value, transferring financial resources across regions and through time, managing and transferring risks, developing

[520] C. Kaufmann and R. Weber, 'The Role of Transparency in Financial Regulation' (2010) 13(3) *Journal of International Economic Law* 779. T. Cottier, J. Jackson, and R. Lastra, *International Law in Financial Regulation and Monetary Affairs* (Oxford, OUP 2012).
[521] R. Lastra and H. Shams, 'Public Accountability in the Financial Sector' in E. Ferran and C. Goodhart, *Regulating Financial Services and Markets in the Twentieth First Century* (Oxford, Hart Publishing 2001).

transactions information, and managing incentives.'[522] Banks, funds, insurance firms, and retail investors can all feature in each of these functions. However, the financial system can be viewed as more than a set of institutions and markets interacting. A financial system consists of interactions and interlinkages between markets, institutions, participants and functions. The concept of a financial system must take account of interactions within, and between, functions and participants.[523] Any identification or combatting of systemic risk must include an analysis and evaluation of the interconnectedness of the entire financial system as the primary source of the transfer, accumulation and storing of systemic risk.[524]

Analysing each function or behaviour in isolation is unhelpful in providing insights about where systemic risks can emerge from. For instance, clearing and settlement are not just a function performed by banks.[525] It is a function performed by banks for many clients in many industries, including the fund industry. Banks may operate payment systems, but banks may be instructed by a funds client to pay an investor its redemption proceeds. The pooling of funds may be managed at a bank, but the funds represent the investment proceeds of many institutions, pension assets and, ultimately, retail investors in a fund vehicle.[526] Analysing one group of institutions, one market, one group of investors, or one product, may be a way that the complexity of the financial system can be broken down in order for academics and practitioners to understand it piecemeal.[527] However, that is not the approach that will lead to a broad-based identification of systemic risk.

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[522] Neave, *supra* note 102.
[523] D. Crane, K. Froot, S. Mason, A. Perold, R. Merton, Z. Bodie, E. Sirri, and P. Tufano, *The Global Financial System: A Functional Perspective* (Boston, Harvard Business School Press 1995).
[524] O. Williamson, *Markets and Hierarchies: Analysis and Antitrust Implications* (NY, Free Press 1975) as developed further in E. Neave, *The Economic Organisation of a Financial System* (London, Routledge 1991) and E. Neave, *Financial Systems: Principles and Organisation* (London, Routledge 1998).
[525] Neave, *supra* note 102, 16.
[526] *Ibid*., 18.
[527] S. Schwarcz, 'Regulating Financial Change: A Functional Approach' (2016) 100(4) *Minnesota Law Review* 1441, 1469.

Identifying and combatting systemic risk therefore requires: (1) an understanding that interconnectedness links with concentration risk, which is a key trigger of systemic risk, and (2) an understanding that interconnectedness links industries, so that systemic risk is more than a hedge fund industry issue. Although this research is focused on hedge fund systemic risk, it must be acknowledged that interconnectedness is a wider, cross-jurisdictional and cross-sectoral issue.

3.4.1.3. Regulatory challenges in using mandatory disclosure to identify and combat systemic risk

A regulator's primary purpose is to supervise the market to ensure market participants are protected and that the financial system remains stable and functioning.[528] In ensuring financial stability, regulators are concerned with several types of risks resulting from interconnectedness. These risks include, *inter alia*, credit risk, concentration risk, liquidity risk and contagion risk.[529] Systemic risk acts as an umbrella category comprising all of these macro-prudential risks. However, without access to data sets concerning these risks, a regulator cannot effectively supervise the risk associated with interconnectedness. This is primarily why mandatory disclosure regimes are introduced. They enable regulators to create quantitatively measurable aggregate indicators that, if appropriately calibrated, allow potential systemic events or emerging risks to be anticipated.[530]

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[528] Financial Condustc Authority, 'Our approach to supervision' 19 March 2024; available at: https://www.fca.org.uk/publications/corporate-documents/our-approach-to-supervision#:~:text=Our%20supervision%20work%20aims%20to,Retail%20markets (data accessed: 4 January 2026).

[529] A. Jenkins, 'Financial Regulation, Systemic Risk, and the Audit of Financial Contagion' (2011) Committee on Capital Market Regulation; available at: https://capmktsreg.org/wp-content/uploads/2022/11/2012.11.20_Interconnectedness_and_Contagion-1.pdf? (date accessed: 4 January 2026). Credit risk is the risk that a financial institution defaults on the debt it has borrowed. Concentration risk is the risk that exists when a portfolio is exposed to a single counterparty. Liquidity risk is the risk that an institution will not have sufficient funds to be able to meet its short term cash requirements. Contagion risk is the risk that difficulties experienced at one institution may spill over to another institution because of the trading relationship between those two institutions.

[530] M. Beville, D. Falaschetti, and M. Orlando, 'An Information Market Proposal for Regulating Systemic Risk' (2010) 12 *Journal of Business Law* 849.

Two additional notable challenges can also be recognised. Firstly, as systemic risk concerns the financial system's stability, it is referred to as a macro-prudential issue. However, a question that regulators struggle with is whether such a risk is being combatted effectively through macro-prudential regulation.[531] For example, macro-prudential regulation of systemically important financial institutions (SIFIs) has become a major focus of regulatory reform.[532] Still, macro-prudential regulation does not take account of all trade or exposure-based elements which contribute to systemic risk, and which could be disclosed. The issue is whether it is most effective to identify and combat systemic risk at the individual firm level or to do so at the market or aggregate level. Therefore, systematic regulation of systemic risk has been proposed.[533] Such a proposal would mean designing and enforcing a consistent regulatory framework that monitors, limits, and mitigates risks that could destabilise the financial system as a whole, rather than just focusing on individual firms in isolation. Such a systematic approach would have to be based on increased transparency at the individual firm level. Increasing transparency of individual firms can contribute to gaining the overall data needed to correct market failures and potential consequent crises.

The second challenge concerns how regulatory fragmentation can result in reporting fragmentation. Where supervisory responsibilities are divided across authorities, regulated entities and regulatory regimes, there can be divergent reporting standards. This can result in duplication, inconsistency, and reduced data comparability. Empirical research shows that regulatory fragmentation across multiple agencies exacerbates the complexity and

[531] S. Schwarcz, 'Systematic Regulation of Systemic Risk' (2019) 1 *Wisconsin Law Review* 2.
[532] *Ibid*. Also, see Bank of England report 'Financial Stability in Focus: The FPC's macroprudential approach to operational resilience' 27 March 2024, available at: https://www.bankofengland.co.uk/financial-stability-in-focus/2024/march-2024 (date accessed: 4 January 2026). Also, see 2.3.5.
[533] Schwarcz, *supra* note 120, 3.

inconsistency of disclosure requirements for firms facing overlapping rules.[534] Arguably, the issue with current regulatory reporting fragmentation is that systemic risk is a combination of risk that is transmitted, risk that is accumulated, and risk that is stored. Transmission of risk relates to transactions executed within financial markets. Risk accumulation relates to the growing of risk at a firm through the increasing of a position in a particular security. The store of risk refers to netted risk position that is held by a firm. The trigger of a systemic risk event can occur in any one of these three key areas of transmission, accumulation and storage.[535]

A data-based understanding of how risk moves and resides is essential. Granular high-quality data[536] must be captured to determine exposures and flows of risk at all three stages. Without transaction-level data that is aggregated and structured, it is difficult to trace how systemic risk propagates between market participants. Without position-level data, the build-up of concentrated risk exposures cannot be observed in real time. It would not be possible to determine where systemic risk was concealed.[537] Finally, without accurate data on net holdings, the true scale of systemic risk retained within the financial system would remain obscured from the view of regulators. It is in the structuring and connection of these data points that a regulator can form a coherent, system-wide view of evolving systemic risk and intervene before they crystallise into uncontrollable systemic events.[538]

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[534] J. Kalmenovitz, M. Lowry, and E. Volkova, Regulatory Fragmentation Working Paper (December 2022); available at: https://www.aeaweb.org/conference/2023/program/paper/7r638aZ5 (date accessed: 4 January 2026).
[535] P. Smaga, 'The Concept of Systemic Risk' (2014) SRC Special Paper No. 5, 1.
[536] Bank of England, Shining a light on hidden leverage: using transaction level data to monitor leveraged positions in the non-bank financial system, (June 2025); available at: https://www.bankofengland.co.uk/bank-overground/2025/shining-a-light-on-hidden-leverage-using-transaction-level-data-to-monitor-leveraged-positions (date accessed: 4 January 2026).
[537] *Ibid*.
[538] ESRB, EU Non-bank Financial Intermediation Risk Monitor 2025; available at: https://www.bankingsupervision.europa.eu/activities/srep/2025/html/ssm.srep202511_aggregatedresults2025.en.html (date accessed: 4 January 2026).

Arguably, reporting fragmentation impairs effective disclosure and this can, in turn, hinder the detection of systemic risk. The transfer of risk can be ascertained by mandatory disclosure regimes, which are designed to capture individual transactions.[539] The accumulation or store of risk can be determined by mandatory disclosure regimes, which are designed to capture position data.[540] Together, these two data sets can more accurately assess the potential building of systemic risk within a sector. However, the challenge is in acquiring accurate and timely information to support regulatory intervention. Even if transaction data is available in real-time, the accumulation or store of risk data may only be available up to six months in arrears because regulators need time to analyse, clean, structure and interpret submitted data.[541] Individual transaction data would need to be aggregated and structured in real-time to be able to identify where systemic risk was located. This location of risk would need to be identified in real-time in order to combat its materialisation within the same timeframe. Aggregating such data from separate disclosure regimes will be a difficult, if not an illusory, objective. [542]

Opacity and the lack of transparency can catalyse arbitrage if there are no means of supporting systemic risk-related regulatory intervention.[543] Various market actors have exploited regulatory fragmentation and the resulting arbitrage opportunities, as evinced by the pre-crisis shadow banking industry. Such market participants have not been under obligations to disclose data, and regulators have not been able to aggregate shadow banks' risk transfer,

[539] ESMA, New report sheds light on quality and use of regulatory data across EU (April 2024); available at: https://www.esma.europa.eu/press-news/esma-news/new-report-sheds-light-quality-and-use-regulatory-data-across-eu (date accessed: 4 January 2026).
[540] *Ibid*.
[541] ECB, Annual Report on Supervisory Activities 2024; available at: https://www.bankingsupervision.europa.eu/press/other-publications/annual-report/html/ssm.ar2024~700cba1314.en.html (date accessed: 4 January 2026).
[542] ECB, Financial Stability Review 2025 on fragmented and incomplete data; available at: https://www.ecb.europa.eu/press/financial-stability-publications/fsr/html/ecb.fsr202511~263b5810d4.en.html (date accessed: 4 January 2026).
[543] M. Mies, 'Bank opacity, systemic risk and financial stability' (2024) 70 *Journal of Financial Stability* 1

accumulation and storage with other sectors. This perpetuates the potential of systemic risk and the inability of a regulator to identify or combat it through disclosure-based tools. Therefore, in trying to combat systemic risk through regulatory fragmentation, the arguable result is that it has simply moved to a different part of the market through regulatory arbitrage. [544] Regulatory reform and the imposition of mandatory disclosure regimes by regulators seek to align the treatment of common risks across the market, which are being regulated under different regimes. Systemic risk is a cross-sectoral and cross-border issue. Regulatory fragmentation into silos arguably translates into ineffective regulatory reporting fragmentation. Therefore, alignment of regimes is of paramount importance.

Financial stability can be framed in terms of ensuring 'resilience' within the financial system. Although much regulatory intervention has been aimed at promoting a more resilient financial system, there is still a question concerning whether such intervention through transparency has achieved this outcome.[545] Systemic risk in financial markets, as measured through the SRISK methodology, is arguably higher today than at any point post-global financial crisis.[546] This provides some telling context as to the current challenge in implementing effective mandatory disclosure in the interests of financial stability.

3.5. Mandatory disclosure and the hedge funds industry

This part of the chapter focuses on the mandatory disclosure regimes under which hedge funds must currently report security trades. Having established that a mandatory disclosure regime is the most appropriate disclosure-based approach to identify and combat systemic

[544] Awrey and Judge, supra note 100, 2298.
[545] *Ibid*., 2297.
[546] FSB, Evaluation of the effects of too-big-to-fail reforms (June 2020); available at: https://www.fsb.org/uploads/P280620-1.pdf (datd accessed: 4 January 2026).

risk, it is necessary to ask three questions. Firstly, do the existing securities market mandatory disclosure regimes which are applicable to hedge funds exhibit certain characteristics? Secondly, are existing mandatory disclosure regimes insufficient in identifying and combatting systemic risk, and why? Thirdly, if existing regimes are insufficient, then how can a stronger mandatory disclosure regime potentially be created to address systemic risk?

As discussed in Chapter 2, hedge fund systemic risk is linked to the investment products that hedge funds invest in. This systemic risk has phases of transfer or transmission, accumulation, and crystallisation or materialisation.[547] Therefore, based on the analysis in Chapter 2, mandatory disclosure that supports financial stability needs to exhibit three distinct characteristics: (1) identification of the transfer of risk through individual trades, and, the store of risk in existing financial positions, (2) aggregation of this data across the market to understand interconnectedness and the locations of burgeoning systemic risk, and (3) be in a real-time format to counteract the sudden and unexpected nature of systemic risk materialisation.[548]

This part will be broken into two sections. Section 3.4.1 will review the mandatory disclosure regimes of the European Market Infrastructure Regulation (EMIR)[549] and the Securities Financing Transactions Regulation (SFTR).[550] The purpose for selecting these two disclosure regimes is twofold. Firstly, as discussed in Chapter 2, hedge fund leverage is primarily accessed through derivatives and repos.[551] EMIR and SFTR are the Regulations that govern the reporting requirements in these two markets and hence apply to the hedge fund industry.

[547] See 2.3.2.
[548] *Ibid*.
[549] 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, [2012] OJ L201/1.
[550] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1.
[551] See 2.2.3.

Secondly, both disclosure regimes have a self-stated purpose of contributing to the maintenance of financial stability.[552] Section 3.4.2 will critically evaluate the extent to which the characteristics identified within EMIR and SFTR align with the abovementioned design criteria identified. Further, this part will introduce the argument for updating the Alternative Investment Fund Managers Directive (AIFMD) mandatory disclosure regime.[553] This will lay a foundation for a more in-depth discussion of this regime as they apply to the hedge fund industry in Chapter 4.

3.5.1. Identifying mandatory disclosure characteristics

The anticipated outcomes of reporting are crucial to considering the most appropriate design characteristics of a mandatory disclosure regime. In effect, the design of a disclosure regime can be predicated on what types of information are being sought by the regime in question. From a hedge fund perspective, mandatory disclosure is most frequently associated with achieving financial stability. Hence, information disclosure must take into account several considerations. Firstly, in order to support financial stability, what standardised data sets should be required? This helps to identify the transfer of risk through market trading. Secondly, should these data sets be submitted to the market or to the regulator? This facilitates the aggregation process that needs to take place to understand interconnectedness. Thirdly, should these data sets need to be submitted and assessed in real-time or not? Fourthly, should these data sets be useful in their submitted state or should they need to be

[552] 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, [2012] OJ L201/1, recital 3. Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1, Recital 2.
[553] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, p. 73. Regulation (EU) No 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, [2013] OJ L83/1, p. 71–95.

aggregated and structured into actionable intelligence? Fifthly, what type of action may be appropriate based on the structuring of submitted data to ensure financial stability? The third to fifth questions should help a regulator to identify and combat systemic risk that materialises unexpectedly. This section will ask these five questions of both EMIR and SFTR.

3.5.1.1. EMIR

The European Market Infrastructure Regulation (EMIR) is the EU framework introduced following the global financial crisis in 2012 to increase transparency and reduce systemic risk in the over-the-counter (OTC) derivatives market. EMIR applies to the reporting of the entire spectrum of derivative products.[554] This includes swaps, contracts for difference, futures, forwards and options. Such reporting is mandatory, irrespective of whether the derivative was traded on a regulated market, an unregulated market, or a third-country market.[555] All financial and non-financial counterparties trading either over-the-counter (OTC) or exchange-traded (ETD) derivatives contracts must report their trades' details to an authorised EU or third-country Trade Repository (TR). This report includes all of the trade details, including date, time, currency, collateralisation, and a range of valuation requirements. Such reports must be submitted T+1, which means before the end of the date after the trade date.[556] This submitted data to a TR can also be inspected by several bodies, including the national competent authority, ESMA and the ESRB.

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[554] 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, [2012] OJ L201/1, Recital 66 and Article 1.
[555] 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, [2012] OJ L201/1, Article 1(1)-(2). Also, see P. Brandt, 'EMIR Regulations continue to impact derivatives markets in 2014' (2014) 131 *Banking Law Journal* 269.
[556] Regulation (EU) 2017/104 of 19 October 2016 amending Delegated Regulation (EU) No 148/2013 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories with regard to regulatory technical standards on the minimum details of the data to be reported to trade repositories, [2017] OJ L 17/1, Article 9(1).

EMIR set out requirements for the reporting, clearing, and risk management of derivatives. It also established rules for central counterparties (CCPs) that net such risk, and TRs that collect, centrally store, and maintaining the records of derivatives traded.[557] The need to reduce systemic risk is central to EMIR. Throughout its recitals, it is clearly stated that systemic risk is reduced through the mandatory transparency and mandatory central clearing (for exchange-traded derivatives) measures.[558] For bilaterally negotiated non-centrally cleared derivative trades (over-the-counter trades), there is an additional requirement of risk mitigation.[559] However, this research is only concerned with an analysis of the mandatory disclosure elements of those systemic risk reduction measures.

The overarching reporting requirement of EMIR is stated as:

> 'Counterparties and CCPs shall ensure that the details of any derivative contract they have concluded and of any modification or termination of the contract are reported to a trade repository registered in accordance with Article 55 or recognised in accordance with Article 77. The details shall be reported no later than the working day following the conclusion, modification or termination of the contract.'[560]

The purpose of having near real-time disclosure is to increase transparency within derivative markets in order to facilitate the reconciliation and netting of risk associated with such trading. This reduces risk within derivative markets, specifically systemic risk. However, as

[557] G. Ferrarini and P. Saguato, 'Reforming Securities and Derivatives Trading in the EU: From EMIR to MIFIR' (2013) 13(2) *Journal of Corporate Law Studies* 319.
[558] 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, [2012] OJ L201/1, Recitals 7, 8, 15, 21, 29, 31, 37, 38, 41, and 43.
[559] 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, [2012] OJ L201/1, Recitals 4, 23, 24, 25, 30, and 31.
[560] 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, [2012] OJ L201/1, Article 9(1).

stated above, the report is made after all modifications. Such modifications may take weeks to agree, and therefore, in reality, trades are very often reported several weeks after their initial trade date.[561] Therefore, two issues exist. Firstly, not all counterparties or derivative trades are within the scope of the reporting requirement. Exemptions are available from a national competent authority.[562] Hence, what is reported is not a full picture of the market. Secondly, for in-scope trades, a complete real-time data set of all derivative market trades – as entered into day-by-day – does not exist. Only when trades are concluded and no longer subject to modification are they reported T+1.

The reporting of the trade details can be delegated.[563] Such delegation can be to a bank, an authorised clearing house, or a third-party service provider. The reason why such a delegation may be considered is because of the complexity involved in the daily reporting process and the breadth of data fields that must be collected and verified. Such processes are often not within the expertise of market participants, such as hedge funds, as their trades will be passed to a broker to be executed in the market. Hence, visibility of delegation arrangements is important in ensuring an effective disclosure regime.

The reports of trade details are in a standardised format, updated by the EMIR Refit Regulation.[564] This standardised format requires in excess of 200 pieces of information per trade. These include, *inter alia*, the counterparty Legal Entity Identifier (LEI), the direction of

[561] ESMA Q&A, 'Implementation of the Regulation (EU) No 648/2012 on OTC derivatives, central counterparties and trade repositories (EMIR)' 19 November 2021, p. 86-88; available at: https://www.esma.europa.eu/sites/default/files/library/esma70-1861941480-52_qa_on_emir_implementation.pdf (date accessed: 4 January 2026).
[562] *Ibid*., 88 and 118.
[563] 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, [2012] OJ L201/1, Article 9(1).
[564] For the new reporting format under the EMIR Refit Regulations which applies from 2024, see Regulation (EU) 2022/1860 of 10 June 2022 laying down implementing technical standards for the application of Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to the standards, formats, frequency and methods and arrangements for reporting, [2022] OJ L262/68.

the trade, collateralisation of the trade, the classification of the derivative, and a Unique Trade Identifier (UTI).[565] The purpose of this UTI is to give every derivative trade a unique identifier that is then used to match trades to net down risk. As both counterparties to a trade are responsible for reporting, these trades must be matched in order to prevent duplication in reporting.[566] The purpose of this standardisation is to increase compliance levels within the industry in light of the complexity of the reporting process and required data sets.

The significance of data quality and trade matching issues has led to updates in the fields required to be completed under the new EMIR Refit Regulation. However, complying with these updated requirements has proven challenging.[567] The EMIR Refit Regulation has significantly expanded and restructured reporting requirements in terms of the number of fields and the systems and governance frameworks of firms. Challenges have resulted in sourcing and reconciling new UTI and LEI identifiers, maintaining data quality, and ensuring consistent reporting across the EU regimes. Overall, EMIR Refit has transformed trade reporting into a complex data management and validation exercise requiring strong traceability of the data, higher levels of accuracy, and enhanced integration across multiple EU-wide systems.[568]

[565] Regulation (EU) 2022/1860 of 10 June 2022 laying down implementing technical standards for the application of Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to the standards, formats, frequency and methods and arrangements for reporting, [2022] OJ L262/68, Annex Table 1, which contains a full list of fields.
[566] 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, [2012] OJ L201/1, Article 9(2).
[567] ESMA, Final Report: Guidelines for reporting under EMIR, 14 December 2022, p. 49, 51, 56; available at: https://www.esma.europa.eu/sites/default/files/library/esma74-362-2281_final_report_guidelines_emir_refit.pdf (date accessed: 4 January 2026).
[568] ESMA, EMIR Refit Guidelines; available at: https://www.esma.europa.eu/data-reporting/emir-reporting? (date accessed: 4 January 2026).

The reporting of trades must be made to one of two parties. In the first instance, it must be made to an authorised TR.[569] This TR will be authorised by ESMA to collect and maintain records of both exchange-traded and OTC derivative transactions entered into by counterparties. Alternatively, if a TR is not available, then the report must be made directly to ESMA.[570] There is no reporting to the national competent authority or the market. ESMA does maintain a public register, but it only relates to information concerning the classification of derivative contracts and the organisations that have been authorised as a CCP.[571] This requirement reinforces how systemic risk is an issue of EU concern, rather than a merely national concern at the Member State level. ESMA's mandate in supervising the market, and the crossover with delivering EMIR's self-stated objective of combatting systemic risk, places ESMA in a central position in guaranteeing transparency.

The reduction of systemic risk can be achieved through a combination of EMIR's requirement of near real-time reporting (once modifications are concluded), matching of individually reported trades, the reporting of collateralisation of each trade, and ultimately the netting of risk at the CCP level.

3.5.1.2. SFTR

[569] 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, [2012] OJ L201/1.
[570] 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, [2012] OJ L201/1, Article 9(3).
[571] 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, [2012] OJ L201/1, Article 2(1) states that "'CCP' means a legal person that interposes itself between the counterparties to the contracts traded on one or more financial markets, becoming the buyer to every seller and the seller to every buyer."

The Securities Financing Transactions Regulation (SFTR) is closely linked to EMIR in that its goal is to increase transparency within securities financing markets.[572] SFTR covers transactions that are not considered derivatives. Therefore, it covers securities such as repos, margin lending and securities lending.[573] It applies similar rules to the trading of these securities as EMIR applies to the trading of derivatives.

The promotion of financial stability is a focal aim of the SFTR.[574] This financial stability outcome is achieved through the reporting of securities financing transactions to a TR and the safeguarding of client assets. This research focuses on the mandatory disclosure aspect of these measures introduced to ensure financial stability.[575]

The reporting requirement of SFTR is stated as:

> 'Counterparties to SFTs shall report the details of any SFT they have concluded, as well as any modification or termination thereof, to a trade repository registered in accordance with Article 5 or recognised in accordance with Article 19. Those details shall be reported no later than the working day following the conclusion, modification or termination of the transaction.'[576]

[572] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1.
[573] H. Nabilou and A. Prüm, 'Shadow Banking in Europe: Idiosyncrasies and Their Implications for Financial Regulation' (2019) 10(4) *European Journal of Risk Regulation* 781.
[574] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1, Recitals 9, 12, 13, and 21.
[575] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1, Article 4
[576] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1, Article 4(1).

Therefore, similar to EMIR, all required trade details must be submitted to an authorised TR, in near real-time, in accordance with the implementing technical standard.[577] However, the reality is that trades are often reported and matched several days or weeks after the execution process begins because the trade gets modified.[578] Although this ensures matching and reconciliation, this is counter to the 'working day' definition, albeit generalised, within SFTR. In line with those introduced by EMIR, standardised data sets must be submitted to a TR or, in the absence of such, directly to ESMA.[579] The fields that must be reported include, *inter alia*, the LEI, the UTI, and the trade data particulars.[580]

This standardised approach to reporting is intended to create uniformity across the EU and certainty in achieving compliance. As counterparties reporting on the same trade may be located in different EU jurisdictions, this standardisation facilitates the reconciliation and matching process at the centre of the disclosure regime. The standardisation is also being aligned with that of EMIR to address shared strategic supervisory priorities such as, *inter alia*, the use of common TRs, accuracy and security of reported data, and the consistency of reported information.[581] There are many challenges with trade reporting under SFTR that are similar to the challenges identified for EMIR. Trade data quality, the process for generating

[577] Regulation (EU) 2019/363 of 13 December 2018 laying down implementing technical standards with regard to the format and frequency of reports on the details of securities financing transactions (SFTs) to trade repositories in accordance with Regulation (EU) 2015/2365 of the European Parliament and of the Council and amending Commission Implementing Regulation (EU) No 1247/2012 with regard to the use of reporting codes in the reporting of derivative contracts, [2019] OJ L 81/85.
[578] ESMA, Questions and Answers On SFTR data reporting, 19 July 2022, p. 13; available at: https://www.esma.europa.eu/sites/default/files/library/esma74-362-893_qas_on_sftr_data_reporting.pdf (date accessed: 4 January 2026)
[579] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1, Article 4(5).
[580] Regulation (EU) 2019/363 of 13 December 2018 laying down implementing technical standards with regard to the format and frequency of reports on the details of securities financing transactions (SFTs) to trade repositories in accordance with Regulation (EU) 2015/2365 of the European Parliament and of the Council and amending Commission Implementing Regulation (EU) No 1247/2012 with regard to the use of reporting codes in the reporting of derivative contracts, [2019] OJ L 81/85, Annex 1, Table 1, which contains a full list of fields.
[581] ESMA, EMIR and SFTR data quality report 2021, 1 April 2022, p. 4; available at: https://www.esma.europa.eu/sites/default/files/library/esma74-47-607_2021_emir_and_sftr_dq_report.pdf (date accessed: 4 January 2026).

UTIs, the number of fields that must be completed, and the difficulty in obtaining the required information in an opaque market function, such as prime brokerage, are major challenges for this new regulation.

There is no SFTR reporting to the national competent authority or the market. However, as in the case of EMIR, a number of supervisory bodies, including the national competent authority, can inspect data of a TR.[582] However, it is worth noting that no aggregated view of the panel of authorised TRs seems to exist for the purposes of SFTR. It is therefore unclear how an inspecting body would identify or combat systemic risk based on this inspection right. Although there are instances where data is aggregated and reported, such as the TR's responsibility to publish aggregate positions in each security category, there is no obligation on ESMA for this aggregation and reporting to be in real time. Pursuant to SFTR, each TR needs only to make access to data available to ESMA should ESMA want to view the data to execute its own mandate.[583]

In summation, it is evident that EMIR and SFTR are similar in terms of their requirement for near real-time reporting – to a TR or direct to ESMA – on a trade-by-trade basis, for purposes of ensuring financial stability. However, a critical evaluation of these requirements is necessary to understand the extent to which EMIR and SFTR may be improved to achieve their self-stated purpose of combatting systemic risk to ensure financial stability.

[582] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1, Article 32(2)(3),
[583] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1, Article 12(2).

3.5.2. Critical evaluation of disclosure characteristics against design criteria

This section will critically evaluate key aspects of the mandatory disclosure regime of EMIR and SFTR by focusing on the design strengths and weaknesses that are evident in the pursuit of financial stability outcomes. This section will argue that both regimes exhibit the same strengths of requiring trade-by-trade reporting on a real-time basis. However, both the EMIR and SFTR regimes also exhibit the same weakness of only requiring disclosure on a trade-by-trade basis. EMIR and SFTR do not require real-time disclosure of information on the accumulated size of a fund's trading position, which is added to by individual trades. The thesis has already emphasised how a focus on individual transactions fails to capture growing systemic vulnerabilities. This analysis will lay a foundation for assessing the disclosure requirements under AIFMD's mandatory disclosure regime in Chapter 4 and proposing the amendment of its mandatory disclosure regime to more effectively deliver financial stability, based on enhanced reporting and supervisory intervention.

In the immediate aftermath of the 2008 financial crisis, the G20 Pittsburgh Summit of 2009 set a regulatory agenda to bring the opaque over-the-counter (OTC) sector on-exchange through central clearing.[584] As part of this agenda, and as mentioned above, all standardised OTC derivative contracts were mandated to be cleared through central counterparties (CCPs).[585] The contracts were also to be reported to a TR. For the purposes of this research, the near real-time reporting of individual trade data represented a major step forward in the regulatory agenda against systemic risk. The content and frequency of reporting constituted a significant strength of a mandatory disclosure regime.[586]

[584] G20 Leaders Statement: The Pittsburgh Summit September 24-25, 2009, Pittsburgh; available at: http://www.g20.utoronto.ca/2009/2009communique0925.html (date accessed: 4 January 2026).
[585] ECB, 'Looking back at OTC derivative reforms – objectives, progress and gaps' August 2016, available at: https://www.ecb.europa.eu/pub/pdf/other/eb201608_article02.en.pdf (date accessed: 4 January 2026).
[586] *Ibid*., subsection 1 and 3.

SFTR introduced EMIR-like reporting requirements for securities financing transactions. SFTR required the reporting of similar data points to an authorised TR. Reporting fields included the time and date of the trade, the Legal Entity Identifier details, the type of counterparties involved in the trade, and collateral details.[587] It is common for EMIR and SFTR reporting to be made to the same TR, of which the list of approved TRs under each Regulation is virtually identical.[588] Both are required to be reported T + 1. However, this data is on a trade-by-trade basis. Total accumulated trading positions or leverage levels of the fund are not reported.[589] The information that must be submitted to a TR includes, *inter alia*, the collateral used and its value, restrictions on re-hypothecation of the collateral, cost of the transaction, haircut, currency and maturity.[590] The format and frequency of reporting under SFTR are similar to how derivatives transactions are reported under EMIR. Therefore, as a potential systemic risk identification and combatting mechanism, SFTR exhibits the same strengths as EMIR from a mandatory disclosure regime perspective.

It is evident that EMIR and SFTR demonstrate key attributes of what may be expected of an effectively designed mandatory disclosure regime seeking financial stability outcomes. Both regimes mandate disclosure of individual trade data sets. The regimes also mandate this disclosure in near real-time. In parallel, technology solutions are increasingly being

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[587] See list of SFTR reporting fields at: https://www.esma.europa.eu/sites/default/files/library/2016-1409_sftr_tables_cp_version.xlsx (date accessed: 4 January 2026).

[588] See list of ESMA approved Trade Repositories under EMIR and SFTR at https://www.esma.europa.eu/supervision/trade-repositories (date accessed: 4 January 2026).

[589] A. Johnston, 'Regulating Hedge Funds for Systemic Stability: The EU's Approach' (2015) 21 *European Law Journal* 771. Also, ESMA, 'Report on securities financing transactions and leverage in the EU' 4 October 2016; available at: https://www.esma.europa.eu/sites/default/files/library/2016-1415_-_report_on_sfts_procyclicality_and_leverage.pdf (date accessed: 4 January 2026).

[590] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1, Article 4. Also, see H. McVea, 'Restoring Regulatory Credibility and Preventing 'Repo Runs': A Cautionary Tale' (2019) 30 *European Business Law Review* 18.

developed in reporting and supervision, resulting in mandated formats and frequency of reporting being increasingly well-embedded in the functioning of the market.[591] This thesis seeks to take a combined view of both paths of evolution – technology and regulation – in order to propose a solution specifically for the hedge fund industry and associated systemic risk.

Paradoxically, the fact that EMIR and SFTR focus on the reporting of individual trade data is both a weakness and a strength. The daily reporting of individual financing trades may give a sense of transmission or accumulation of systemic risk. However, a determination of systemic risk can only be conclusively made by viewing how a transmission adds to an existing risk accumulation. Disclosure of individual trade data only gives transparency in relation to the transfer or transmission of systemic risk. However, as discussed in 2.3.2, systemic risk includes transmission and accumulation risk. The accumulation of risk can only be seen through the transparency of funds' trading positions and leverage levels. Put another way, the weakness of EMIR and SFTR is that they do not facilitate transparency surrounding the accumulation of systemic risk because neither EMIR nor SFTR mandate the disclosure of position or leverage data. This lack of granularity of data also makes it very challenging to extract meaningful intelligence from the aggregation of the reported data sets that are reported.[592]

[591] J. McCarthy, 'The Regulation of RegTech and SupTech in Finance: Ensuring Consistency in Principle and in Practice' (2023) 31(2) *Journal of Financial Regulation and Compliance* 186.

[592] ESRB opinion to ESMA on securities financing transactions and leverage under Article 29 of the SFTR, October 2016, p. 16; available at: https://www.esrb.europa.eu/pub/pdf/other/20161004_esrbopinion.en.pdf (date accessed: 4 January 2026). It is important to note that the ESRB focuses on the solution of international agreement on margin and haircut requirements as a way to combat systemic risk. There are many different ways to combat systemic risk. However, this research focuses on how to do this from a reporting perspective. However, one of the proposals of this research is the use of reported data to support a real-time circuit breaker regime. A circuit breaker regime, not based solely on price, but also upon margin and haircut limits may be appropriate.

A further limitation of this issue is that not all trades or counterparties need to report under SFTR or EMIR. Exemptions can be given by national competent authorities. Furthermore, trades may be modified several times and therefore, may not be reported for days or weeks after execution. All these issues weaken the ability of reported data to represent a complete picture of the security trading on a particular day. The question is how systemic risk can be identified and combatted without a full data set, and when it is, in fact, not real-time.

EMIR operates a clearing threshold and position matching process.[593] The clearing threshold is a notional amount of OTC derivatives above which a firm must centrally clear certain trades through a clearing house, rather than just negotiating and trading bilaterally between the counterparties. The position matching or reconciliation process requires counterparties to regularly compare their OTC positions to ensure details such as notional value, maturity, and valuation are correct. Together, these rules reduce systemic risk by pushing large exposures into safer clearing structures and by ensuring accurate, consistent records between trading partners. A reporting requirement is placed on counterparties who have a net exposure above the threshold.[594] The position matching is completed by the TR, not reported by the counterparty. Reported exposures are cleared through a CCP. This process is event-driven, which means that it does not track how the exposures ebb and flow due to other forces at play within the market on a daily basis. Also, the clearing process is designed to address the net exposure between the two trading counterparties. It is not designed to act as a mechanism for assessing the entire market, although sector-wide analysis can be undertaken. A criticism of the EMIR clearing process is that central counterparty interoperability, or lack thereof, is a

[593] 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, [2012] OJ L201/1, Articles 10 and 11.
[594] 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, [2012] OJ L201/1, Article 10(1).

systemic risk.[595] This is because there are many CCPs that can be used across, *inter alia*, the EU, UK, and US. However, members of one CCP can trade with members of another CCP. This puts CCPs, participants and markets at risk.[596]

The weakness of this approach is arguably in the scope. The EMIR and CCP approach to netting risk exposure primarily focuses on individual events, such as the execution or clearing of specific trades. This event-driven focus means that the framework does not track the total accumulated risk across the market over time. As a result, it provides limited insight into where the overall store of risk is located and how it is evolving, which can ultimately obscure a view of emerging systemic risk. Netting risk is a different perspective from aggregating risk. This is also visible when reported data under EMIR is aggregated to determine sectoral net positions. When aggregated, it can result in significant discrepancies.[597] Such discrepancies refer to inconsistencies and mismatches that appear when EMIR-reported data is aggregated to assess sector-wide net positions, rather than looking at individual counterparty exposures.

The ability to see transmission and accumulation, the ability to see granular transactions and positions, the ability to have data sets without time-lags, and the balance between too much and too little data all need to be considered. Focusing on individual transactions does not give a view of burgeoning systemic risk.[598] This creates a question concerning the ability of a

[595] L. Veraart and I. Aldasoro, 'Systemic Risk in Markets with Multiple Central Counterparties' (2025) 35 *Mathematical Finance* 214. I. Aldasoro and L. Veraart, Systemic Risk in Markets with Multiple Central Counterparties (BIS Working Paper No 1052, 21 November 2022).
[596] ESRB, 'CCP interoperability arrangements', January 2019, p. 4; available at: https://www.esrb.europa.eu/pub/pdf/reports/esrb.report190131_CCP_interoperability_arrangements~99908a78e7.en.pdf (date accessed: 4 January 2026).
[597] Office for National Statistics, 'Potential application of the European Market Infrastructure Regulation (EMIR) data in the national accounts: flow of funds', 26 November 2019, p. 10-16; available at: https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/articles/potentialapplicationoftheeuropeanmarketinfrastructureregulationemirdatainthenationalaccounts/flowoffunds (date accessed: 4 January 2026).
[598] *Ibid*., 19.

mandatory disclosure regime to identify and combat systemic risk when no aggregated view of systemic risk in the market exists. The creation of a regime based on netting each trade at a micro-level and the reliance on theoretical economic forces to maintain stability at a macro-level seems analogous to the fatal assumptions which underpinned regulators' use of the EMH prior to the financial crisis.[599]

From an SFTR perspective, the only type of aggregation undertaken is by the TR. This aggregation takes place at the security level and must take place on a regular basis.[600] These TRs must make this information accessible to bodies such as ESMA, the ESRB and national competent authorities of jurisdictions where a trading venue is used to transact.[601] However, to identify and combat systemic risk, these bodies should arguably require aggregate figures to be reported to them by the TRs. Requiring aggregated disclosure to be reported to a supervisor is a very different prospect from making aggregated data available for access by a supervisor, if required or on request. Therefore, EMIR and SFTR arguably exhibit aggregation weaknesses that run contrary to the desired design characteristics of a systemic risk-focused mandatory disclosure regime.

In summation, in support of financial stability outcomes, EMIR and SFTR mandatory disclosure regimes require reporting on a near real-time basis. The regimes also require the reporting of individual trades and a particular perspective on aggregation. They also have some important flaws due to their focus on individual trades. Further, not all trades are captured under these reporting regimes. It must ultimately be remembered that the design of a

[599] Moosa, *supra* note 77.
[600] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1, Article 12.
[601] Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012, [2015] OJ L337/1, Article 12(2)(a)-(m).

mandatory disclosure regime is crucial to identifying systemic risk and extracting actionable intelligence.

3.6. Conclusion

This chapter focused on addressing the relationship between information, mandatory disclosure regimes and systemic risk identification. EMIR and SFTR were used as examples of existing EU disclosure regimes that were informative in the analysis of mandatory disclosure regimes. In Part 3.2, the justifications for regulatory intervention were discussed. Parts 3.3 and 3.4, it was demonstrated that information is a key element of a functioning market, and that market failure abounds in its absence. The EMH demonstrates the importance of information but also exhibits weakness in the macro-level assumptions upon which it is based. Therefore, regulatory intervention is required to remedy the information-related imbalances that exist in practice within financial markets. In Part 3.5, mandatory disclosure was discussed as the most appropriate regulatory intervention mechanism to combat information-based market failure. The challenge of interconnectedness and its connection to systemic risk can only be identified and combatted through mandatory disclosure. Therefore, transparency can be viewed as supporting the outcome of financial stability rather than being an outcome in its own right. In Part 3.6, mandatory disclosure regime design was analysed from two perspectives. Firstly, to determine a set of theoretical design criteria that enable the effective identification of systemic risk. Secondly, to identify those design characteristics inherent in EMIR and SFTR. Both sets of criteria were then compared in order to determine what design elements are necessary as this thesis moves forward to evaluating the mandatory disclosure regime of AIFMD. Both regimes exhibited essential qualities of reporting trades in real-time. However, in practice, many exemptions

exist, and trades are not always reported in real-time. Both regimes exhibit the same weakness as that of the EMH in that they focus on micro-level issues and rely on the macro-level to take care of itself by default. Both regimes allow inspection of data, but crucially place little focus on aggregation, despite the strategic priority of aligning the EMIR and SFTR mandatory disclosure regimes. In reviewing AIFMD's mandatory disclosure regime and proposing amendments to enable the identification and combatting of systemic risk, these issues must be taken into account. Strengths of being trade-driven and near real-time must be built upon. Weaknesses of the lack of position reporting, aggregation, and real-time intervention in the market must be rectified. With this in mind, the next chapter will take the analytical observations of this chapter regarding mandatory disclosure and apply them to an analysis of AIFMD's Annex IV mandatory disclosure regime.

Chapter 4 THE AIFMD MANDATORY DISCLOSURE REGIME, AS AMENDED

4.1. Introduction

This chapter will focus on the mandatory disclosure regime in AIFMD and especially the changes introduced to the AIFMD[602] mandatory disclosure regime by the Level 1 text of AIFMD II, which has a transposition deadline of 16th April 2026.[603] The rationale for this focus is that an assessment can be made as to whether, or not, these changes help AIFMD to achieve its self-stated purpose of identifying and combatting systemic risk, based on the current format, frequency and timing of reporting as prescribed by AIFMD.

Over the course of the preceding chapters, this thesis has sought to lay a foundation for the hypothesis that systemic risk exists within the hedge fund industry through risky and opaque trading practices and the resulting concentration of risk through accumulated portfolio positions. As has been emphasised throughout this thesis, information asymmetry and opacity are at the centre of regulatory concerns around the hedge fund industry. Therefore, information disclosure has become a core component of regulatory change in the identification and combatting of systemic risk. Regulators have implemented other mechanisms to identify and combat systemic risk, ranging from introducing capital adequacy requirements to regulating the remuneration structure of risk-takers. However, the argument of this thesis centres on the use of mandatory disclosure as a mechanism to facilitate this

[602] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1.
[603] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj.

outcome. Therefore, this chapter will focus on the Annex IV mandatory disclosure regime of the Alternative Investment Fund Managers Directive (AIFMD),[604] its relationship to systemic risk and the impact of changes made to this regime through the approval of AIFMD II.

This chapter will be divided into two parts. Part 4.2 will introduce AIFMD as the foremost EU disclosure framework impacting hedge fund activities and will focus on explaining the Annex IV mandatory disclosure regime. The purpose is to give an overview of the relationship between the required disclosure obligations and the concerns of systemic risk. However, as part of this analysis, it is important to identify which elements of the reporting regime are connected to the issue of systemic risk and which are provided for other reasons, such as fund identification. Not all data provided is of systemic relevance, and much stationary or static data is captured.[605] It is the changing data that is of most benefit. The changing data can be used to extract actionable intelligence or useful additional information. Although not a defined term, actionable intelligence is generally regarded as the gathering and structuring of relevant data to inform and support timely decision-making.[606] The timeframe in which this actionable intelligence can be produced is critical and will also be addressed in this part of the chapter.

Part 4.2 seeks to highlight the key reporting metrics of systemic relevance, such as leverage and liquidity. The level of detail, how and when data is reported, and the ability of a regulator

[604] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, p. 73. Regulation (EU) No 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, [2013] OJ L83/1, p. 71 – 95.
[605] Static data is how information sets that do not change are referred to. This can include fund identification information. This information is not relevant to systemic risk because it does not change and it cannot be aggregated.
[606] See 3.4.

to identify or combat systemic risk, based on this submitted data, will be addressed.[607] Part 4.2 also reviews the identified weaknesses of current AIFMD reporting requirements. This first part will demonstrate that: (1) AIFMD's self-stated purpose of combatting systemic risk through the Annex IV mandatory disclosure regime is achievable and does provide for the disclosure of appropriate data sets for the EU hedge fund industry; and (2) AIFMD's *ex post facto* reporting mechanisms, coupled with its annual, semi-annual or quarterly reporting frequency, are inadequate to facilitate actionable intelligence. In its current format and frequency, AIFMD's mandatory disclosure regime only serves to identify and combat systemic risk long after risk has already materialised.

Part 4.3 of the chapter will consider the changes that have been made to the mandatory disclosure regime through the agreement reached in the Level 1 text of AIFMD II. Several changes address data granularity, information gathering and sharing, reporting frequency, and the relationship between AIFMD and Undertakings for Collective Investment in Transferable Securities (UCITS) Directive.[608] As a Directive represents a framework, it should be noted that the details of the changes will only be fully known after ESMA has drafted regulatory technical standards (RTS) and implementing technical standards (ITS). As of the point of submission of this thesis, ESMA had drafted RTS concerning liquidity management tools and loan origination. However, it had not published any RTS or ITS on the timing, frequency or

[607] By way of comparison, there is much similarity with the US equivalent, found under the Form PF reporting requirements. ESMA has an alignment with the US approach. Although not part of this research, this alignment may provide a useful foundation for future developments that could allow for a global approach to monitoring and combatting systemic risk. See Form PF: Reporting Form for Investment Advisers to Private Funds and Certain Commodity Pool Operators and Commodity Trading Advisors, available at: https://www.sec.gov/files/formpf.pdf (date accessed: 5 January 2026).

[608] Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), [2009] OJ L302/32. Also, Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions, [2014] OJ L257/186.

format of mandatory disclosure.[609] Indeed, ESMA has said there will be delays in producing the range of RTS agreed under AIFMD II, and it has now created a list of those RTS which are essential and those which are non-essential.[610] The focus of this assessment will be on the changes to the reporting regime, but a brief summary of additional changes will also be provided insofar as these changes concern elements that will have an influence on reporting. The purpose is to give an overview of how reporting will be changed, how ESMA has been empowered and delegated to in order to make the required changes, and the extent to which ESMA has extensive abilities in which ESMA may introduce changes in relation to the frequency, timing and format of reporting. Part 4.3 will demonstrate that the door has been opened to ESMA to amend the frequency, timing and format of regulatory reporting going forward. This discretion could provide a significant opportunity for systemic risk to be identified and combatted more efficiently and effectively.

The argument of this chapter is that AIFMD II has been introduced to deal with weaknesses in *inter alia* the reporting requirements of Annex IV. This is important to the overall thesis arguments, because AIFMD II has the ability to facilitate the necessary frequency, timing and format changes which will be proposed in Chapter 5 and at the culmination of this thesis. The amended wording of AIFMD II now gives ESMA the unrestricted ability to amend the frequency, timing and format of reporting through updated RTS and ITS, which are due for submission to the European Commission on 16 April 2027. The RTS can be used by ESMA to change the frequency and timing of reporting to real-time. The ITS can be used by ESMA

[609] ESMA has published implementing rules on Liquidity Management Tools for funds in October 2025. See ESMA, Final Report: Draft Regulatory Technical Standards on open-ended loan-originating AIFs under the AIFMD (October 2025); available at: https://www.esma.europa.eu/sites/default/files/2025-04/ESMA34-1985693317-1259_Final_Report_on_the_Draft_Regulatory_Technical_Standards_on_Liquidity_Management_Tools_under_the_AIFMD_and_UCITS_Directive.pdf (date accessed: 5 January 2026).

[610] European Commission, De-prioritisation of Level 2 acts in financial services legislation (October 2025); available at: https://finance.ec.europa.eu/document/download/a35c9e5a-5fd3-4108-a3b6-aec9e149ddd4_en?filename=251001-level-2-esas-simplification-letter_en.pdf (date accessed: 5 January 2026).

to change the reporting from template-based push reporting to a live feed-based pull reporting format.

4.2. AIFMD's mandatory disclosure regime and its relationship to systemic risk

Ahead of addressing the AIFMD, it is informative to consider how harmonisation—particularly in relation to regulatory reporting—has developed within EU financial services. Harmonisation of reporting rules has long been recognised as an effective mechanism for reducing uncertainty, promoting stability, managing regulatory complexity, facilitating predictable outcomes, and establishing a baseline of common financial resilience across Member States. In particular, harmonised mandatory disclosure enables regulators to receive comparable data sets, based on shared definitions and calculation methodologies, which can be aggregated, structured, and interpreted consistently. This approach to regulatory convergence formed part of the Financial Services Action Plan (FSAP) developed by the European Commission and published in 1999, which laid important foundations for the subsequent integration of EU financial markets.[611]

In order to deliver on the FSAP by the end of 2003, an EU advisory committee, chaired by Alexandre Lamfalussy, published a report on the legislative process and enhancements that could be made to help deliver a more integrated European financial market.[612] This report has

[611] European Commission, Implementing the framework for financial markets: Action Plan (Commission Communication COM(1999)) 232 final, 11 May 1999; available at: https://eur-lex.europa.eu/EN/legal-content/summary/financial-services-action-plan-fsap.html (date accessed: 5 January 2026).
[612] Alexandre Lamfalussy, Final Report of The Committee of Wise Men on the Regulation of European Securities Markets (February 2001); available at: https://www.esma.europa.eu/sites/default/files/library/2015/11/lamfalussy_report.pdf (date accessed: 5 January 2025).

come to be known as the Lamfalussy Process, a process to guide the implementation of EU legislation. This process included four levels: firstly, the European Parliament and Council adopt a basic legal proposal of the Commission; secondly, Commission may adopt technical implementing standards and regulatory technical standards with the assistance of European Supervisory Authorities; thirdly, national supervisorory committees can advise the Commission on guidelines for the adoption and implementation of Level 1 and 2 measures; and fourthly, the Commission is empowered to ensure the correct enforcement of the EU rules by national comptent authorities. This process has been applied by the European Securities and Markets Authority (ESMA) in the regulation of the hedge fund industry.

At Level 1, a framework Directive is provided, which outlines the broad regulatory obligations. An example of this is AIFMD.[613] At Level 2, a detailed Regulation provides the interpretation and reporting format along with Implementing Technical Standards and Regulatory Technical Standards. An example of this is AIFMR.[614] At Level 3, reporting is addressed through ESMA Guidelines, ESMA Opinions, and periodically updated ESMA Questions and Answers. Such guidance has been created for the alternative investment industry, the industry to which the reporting obligation applies.[615] At Level 4, ESMA is given greater powers to promote national competent authorities' convergence in enforcing the

[613] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, p. 73.
[614] Regulation (EU) No 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, [2013] OJ L83/1, p. 71 – 95.
[615] ESMA Final Report: Guidelines on reporting obligations under Articles 3(3)(d) and 24(1), (2) and (4) of the AIFMD, available at: https://www.esma.europa.eu/sites/default/files/library/2015/11/2013-1339_final_report_on_esma_guidelines_on_aifmd_reporting_for_publication_revised.pdf (date accessed: 5 January 2026). ESMA Opinion: Collection of information for the effective monitoring of systemic risk under Article 24(5), first sub-paragraph, of the AIFMD, available at: https://www.esma.europa.eu/sites/default/files/library/2015/11/2013-esma-1340_opinion_on_collection_of_information_under_aifmd_for_publication.pdf (date accessed: 5 January 2026).
ESMA Questions and Answers: Application of the AIFMD, available at: https://www.esma.europa.eu/sites/default/files/library/esma34-32-352_qa_aifmd.pdf (date accessed: 5 January 2026).

regulation of AIFMs. This is visible in recital 69 of AIFMD, where it states that 'appropriate cooperation arrangements for the purpose of systemic risk oversight and in line with international standards should be in place between the competent authorities of the Member States.' Moreover, ESMA facilitates the exchange of information between competent authorities of Member States when it concerns the stability of the market.[616] This section will detail the obligations therein, drawing particular attention to the reporting obligations most connected to the issue of systemic risk. In doing so, this part will be divided into four sections.

The first section will present an introduction to AIFMD and its self-stated purpose of combatting systemic risk. The second section will discuss the structure of AIFMD's mandatory disclosure regime. The third section will review the Annex IV data reporting requirements. The fourth section will identify weaknesses in this regime as identified in the AIFMD II proposal. The argument of this part is that AIFMD's self-stated purpose of combatting systemic risk through the Annex IV mandatory disclosure regime is based on the requirement for appropriate data sets, but that it is not practically possible to achieve this based on the original prescribed frequency, timing and format. This analysis will then allow the question to be posed as to whether or not the changes introduced by AIFMD II open the door for ESMA to introduce updated provisions in relation to frequency, timing and format of reporting, so as to practically reduce systemic risk. This will be addressed in the following part.

[616] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Recital 63 and Articles 25(1), 36(1)(b), 42(1)(b), and 53(1).

4.2.1. AIFMD and its self-stated purpose to combat systemic risk

This section will be divided into two sub-sections. Firstly, a review of the wording of AIFMD will be undertaken to summarise its financial stability self-stated purpose. Secondly, a critical evaluation of this purpose will be given. This will highlight the objectives of AIFMD, but also draw attention to the potential shortcomings in those purposes being achieved.

4.2.1.1. AIFMD's purposes and connection to systemic risk

After the publication of the proposed AIFMD in April 2009, there was intense political negotiation and compromise before an agreement was secured on a draft AIFMD text in October 2010, which was subsequently presented for approval.[617] On 2 December 2010, an initial request for technical advice was made by the European Commission for a proposal on the detailed regulation of alternative investment funds within the EU.[618] This request had originally been made to the Committee of European Securities Regulators (CESR), the predecessor to ESMA, and was worded as follows:

> 'CESR is requested to advise the Commission on the content of the obligation to register with national competent authorities for the entities described in Article 3(2).'

> 'CESR is requested to advise the Commission on suitable mechanisms for national competent authorities in order to gather information from these entities in order to effectively monitor systemic risk as set forth in Article 3(3). To that end, CESR is

[617] House of Lords, The post-crisis EU financial regulatory framework: do the pieces fit? - European Union Committee, 27 January 2015; available at: https://publications.parliament.uk/pa/ld201415/ldselect/ldeucom/103/10308.htm? (date accessed: 5 January 2026).

[618] ESMA, Final report: ESMA's technical advice to the European Commission on possible implementing measures of the Alternative Investment Fund Managers Directive, 16 November 2011, ESMA/2011/379, 7; available at: https://www.esma.europa.eu/sites/default/files/library/2015/11/2011_379.pdf (date accessed: 5 January 2026).

> requested to specify the content, the format, and modalities of the transmission of the information to be provided to competent authorities. CESR is invited to consider the consistency with its advice regarding the Issue 25 (reporting obligations to competent authorities).'[619]

Hence, the initial advice request from the European Commission to CESR placed systemic risk as the key rationale for requiring entities to register under AIFMD and to report information to their national competent authority.

When the draft AIFMD text was approved, there was a clear reference to a systemic risk objective. It was for the stated purpose of ensuring 'stability and integrity of the financial system' that ESMA was given the authorisation to 'impose additional reporting requirements' where it was deemed appropriate and to provide guidelines.[620] As part of the objective relating to systemic risk, AIFMD applies to two levels of Alternative Investment Fund Manager (AIFM). A threshold AIF value is set, above which the AIFM is subject to the full scope of AIFMD. A more lenient regime applies to sub-threshold AIFMs. Recital 17 states that whilst these AIFMs 'are unlikely to have individually significant consequences for financial stability, it is possible that aggregation causes their activities to give rise to systemic risks.' This implies that above-threshold AIFMs may individually be seen as a systemic risk and therefore caught as full-scope firms. Therefore, systemic risk is centrally tied to AIFMD's application to AIFMs, either individually or collectively. In addressing the

[619] *Ibid*., 21.
[620] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Articles 24(5), 47(5)(a), and 47(6)(a).

difference between the two levels of application of AIFMD, a central objective of AIFMD is related to ensuring financial stability and systemic risk.[621]

AIFMD applies in its full scope to AIFMs above a defined size, which is €100 million in assets under management (AUM) for a leveraged Alternative Investment Fund (AIF) or €500 million for an unleveraged AIF.[622] The reason for having leverage attached to the definition of an AIF is straightforward. The AIFMD was designed to catch all funds that were not authorised as UCITS funds. To avoid a scenario where funds tried to circumvent rules by having a lower level of assets under management and using leverage to magnify performance, it was decided to factor in the use of leverage. As private equity funds usually did not use leverage, but hedge funds did, this use of leverage seemed appropriate to ensure the definition of AIF applied to the two major sectors in the AIF sector. Although there is no leverage limit set by AIFMD, an AIFM must set a maximum leverage level for each AIF that it manages, including the impact of rehypothecation[623] on leverage, because of the potential impact on systemic risk. Leverage levels could be imposed by a national competent authority if leverage is causing the build-up of systemic risk within a financial system.[624]

A second level of application is a 'lighter regime' applicable to AIFMs that are below the abovementioned thresholds. In addressing the difference between the two AIFMD regime

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[621] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Recitals 17 and 69.

[622] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 15(4)(d).

[623] This is the practice whereby a financial counterparty that receives assets as collateral for a transaction, uses those assets to generate a profit for itself during the period that they are posted as collateral. See, Brumm, M. Grill, F. Kübler, and K. Schmedders, 'Re-use of collateral: leverage, volatility, and welfare' European Central Banking Working Paper Series No. 2218/December 2018; available at: https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2218.en.pdf (date accessed: 10 January 2026).

[624] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 25(3).

levels, a central defining characteristic relates to financial stability and systemic risk.[625] Threshold conditions for a lighter regime are established by the Recitals, albeit not a binding element of AIFMD. These conditions reflect the emphasis on financial stability and systemic risk represented by all sizes of AIF. Recital 17 provides that:

> '[A]lthough the activities of the AIFMs concerned are unlikely to have individually significant consequences for financial stability, it is possible that aggregation causes their activities to give rise to systemic risks. Consequently, those AIFMs should not be subject to full authorisation but to registration in their home Member States and should, inter alia, provide their competent authorities with relevant information regarding the main instruments in which they are trading and on the principal exposures and most important concentrations of the AIFs they manage.'

Therefore, systemic risk is being considered as an individual factor of larger AIFMs but also as an aggregated consideration of smaller AIFMs.

Diminishing systemic risk is placed within the overall objectives of AIFMD, stated as 'the internal market, investor protection and the effective monitoring of systemic risk.'[626] The objective of financial stability and systemic risk is specifically linked to the issue of hedge funds being leveraged.[627] Further, the effective monitoring of systemic risk is linked to the reporting of leverage levels by AIFMs, irrespective of whether they are EU or non-EU,

[625] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Recital 17.
[626] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Recitals 88 and 90.
[627] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Recital 49-51, Article 25(3), 25(7)-(8).

full-scope or lighter-scope.[628] This reporting of leverage levels is encapsulated within a mandatory disclosure regime requirement to the competent authority of the home Member State of an AIFM.[629] The reporting regime was hence created 'to provide information in order to allow effective monitoring of systemic risk.'[630] Therefore, AIFMD's objectives create a clear relationship between hedge funds, leverage and systemic risk.

4.2.1.2. The political context of AIFMD

Systemic risk became a prevalent concern across the financial system in the aftermath of the global financial crisis. Any unregulated sector, such as shadow banking or hedge funds, was the target of intense debate concerning its contribution to systemic risk. Many in industry and academia referred to AIFMD as having been politically motivated.[631] This political motivation was based on the view that non-regulated sectors contribute to the systemic risk of the banking industry through their interconnectedness. Nabilou refers to two opposing global political views on AIFMD in his assessment of the 'market-making' versus 'market-shaping' roles that hedge funds play.[632] Nabilou explains that the UK, and tangentially the US, view hedge funds as market-making and providing liquidity. Therefore, these jurisdictions did not view hedge funds as representing a systemic risk in need of regulation. However, France,

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[628] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Recital 79.
[629] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 3(3)(d).
[630] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 3(6)(b).
[631] J. Buckley and D. Howarth, 'Internal Market: Regulating the so-Called 'Vultures of Capitalism'' (2011) 49 *Journal of Common Market Studies* 123. E. Ferran, 'After the Crisis: The Regulation of Hedge Funds and Private Equity in the EU' (2011) 12(2) *European Business Organization Law Review* 397. P. Marshall, 'Europe's Classic Exercise in Defending Its Interests', Financial Times, 18 May 2009, p. 9.
[632] H. Nabilou, 'The Alternative Investment Fund Managers Directive and Hedge Funds' Systemic Risk Regulation in the EU' Position Paper of 10 November 2013, 4; available at: https://ssrn.com/abstract=2352373 (date accessed: 5 January 2026).

Germany and Italy, which are not hedge fund centres, saw the industry as a powerful, market-shaping, but unregulated player.[633] These countries' politicians were strongly in favour of increased regulatory intervention in the name of systemic risk prevention. This was further compounded by the advent of new regulatory bodies, such as ESMA and the ESRB, that were being viewed as aggressively looking for opportunities to expand their reach and power in the name of regulating systemic risk.[634]

Arguably, different countries see hedge funds as an advantage or disadvantage. Hedge funds can provide liquidity to a market in which funds are major participants, or hedge funds can be seen as having enough size to disrupt an entire market if they change strategy.[635] Perhaps, as it has not been conclusively stated by regulators that hedge funds are systemically important, AIFMD's stated purpose of monitoring and combatting such risk may be perceived as overstated. However, they are surely systemically relevant due to their interconnectedness within financial markets. AIFMD's adoption may have reflected post-2007 financial crisis political views between differing perspectives, more so than actual economic facts about the systemic risk posed by the hedge fund industry.[636] However, such an argument seems moot, over a decade past AIFMD's implementation. A more current argument is whether or not AIFMD is at a hinge point in terms of being able to introduce change to the frequency, timing

[633] *Ibid*., 4-5.
[634] J. Buckley and D. Howarth, 'Internal Market: Regulating the so-Called 'Vultures of Capitalism'' (2011) 49 *Journal of Common Market Studies* 128. P. Athanassiou, 'The AIFM Directive: An Overview of the Final Rules' (2011) 26(5) *Journal of International Banking Law and Regulation* 242.
[635] F. Ferrara, T. Linzert, B. Nguyen, I. Rahmouni-Rousseau, M. Skrzypińska and L. Vaz Cruz, 'Hedge funds: good or bad for market functioning?' The ECB Blog 23 September 2024; available at: https://www.ecb.europa.eu/press/blog/date/2024/html/ecb.blog20240923~d859db790b.en.html (date accessed: 5 January 2026).
[636] A. Ang, S. Gorovyy and G. van Inwegen, 'Hedge Fund Leverage' (2011) 102(1) *Journal of Financial Economics* 121. N. Papageorgiou and F. Salmon, 'The Role of Hedge Funds in the Banking Crisis: Victim Or Culprit' in Greg N. Gregoriou (ed), *The Banking Crisis Handbook*, (Boca Raton, FL: CRC Press, Taylor & Francis Group, 2010). N. Boyson, C. Stahel and R. Stulz, 'Hedge Fund Contagion and Liquidity Shocks' (2010) 65(5) *Journal of Finance* 1814.

and format of Annex IV reporting in order to effectively deliver upon its self-stated purpose of monitoring and combatting systemic risk.

4.2.2. AIFMD's mandatory disclosure regime

AIFMD's reporting requirement is rooted in Article 3(3)(d), which provides that AIFMs must:

> 'regularly provide the competent authorities of their home Member State with information on the main instruments in which they are trading and on the principal exposures and most important concentrations of the AIFs that they manage in order to enable the competent authorities to monitor systemic risk effectively.'

These reporting requirements are then elaborated on in a Level 2 Regulation.[637] According to Article 110, the regularity of the reporting depends on the size of the AIF and can be annual, semi-annual, or quarterly.[638] The discussion that follows will be broken into two sub-sections that address the requirements of these two levels of rules.

4.2.2.1. Framework reporting requirements

The mandatory disclosure requirements within AIFMD are primarily contained in Article 24. Article 24 is made up of two types of data requirements: firstly, those data sets that must be

[637] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj.
[638] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 110.

reported regularly,[639] and secondly, those data sets that can be requested outside the routine schedule of reporting to a competent authority.[640] Each of these categories will be addressed to give an overview of the scope of AIFMD reporting requirements as applicable to varying types of data sets.

Firstly, Article 24(1) provides that the AIFM must regularly report to their home Member State competent authority in relation to 'information on the main instruments in which it is trading, on markets of which it is a member or where it actively trades, and on the principal exposures and most important concentrations of each of the AIFs it manages.' The information submitted must include details about the instruments traded, markets in which the AIFM is a member or where it trades, and the principal exposure and concentrations of each AIF that it manages, both domiciled in the EU and domiciled in a third country but marketed into the EU.[641] Therefore, in the first instance, it is clear that AIFMD is accomplishing more than just regulating AIFMs; it is also regulating AIFs.

For each AIF that it manages, an AIFM must capture and report the total percentage of fund assets which are subject to any form of special arrangements, such as those arising from the assets being illiquid.[642] It must also capture and report any new arrangements for managing

[639] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(2).
[640] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(3).
[641] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(1). In order to ensure the uniformity of the reporting process across Member States ESMA has created a reporting template that all AIFMs must adhere to. See ESMA Approved AIFMD Reporting Format, available at: https://www.esma.europa.eu/sites/default/files/library/2015/11/2013-1359_consolidated_aifmd_reporting_template-v1.1_revised.xlsx (date accessed: 5 January 2026).
[642] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(2)(a).

the liquidity of each AIF and its risk profile.[643] Risk management is a significant requirement of reporting, and an AIFM must report the system by which it manages the market risk, liquidity risk, counterparty risk, and operational risk of each AIF it manages.[644] Also, any other material risks of the main categories of assets that its funds are invested in must be disclosed.[645] This must be supported by stress testing undertaken in accordance with the requirements detailed under Articles 15(3) and 16(1) and reporting of the calculated results.[646]

Secondly, not all data must be provided regularly. There is data that the AIFM need only provide on request by the home Member State competent authority. The data sets that only need to be available on request include (1) annual reports, (2) additional data sets that help in monitoring systemic risk, and (3) data relating to leverage.[647]

In relation to annual reports, this includes a detailed list of each AIF managed by the AIFM, whether it is EU-domiciled, or third-country-domiciled but marketed into the EU.[648] There are annual reporting requirements already provided for under Article 22 which must be adhered to. These include the obligation to make annual reports available to investors and the competent authority upon request. Article 22 sets a requirement for each AIF to prepare an

[643] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(2)(b).
[644] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(2)(c).
[645] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(2)(d).
[646] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(2)(e). Stress testing must be performed in accordance with point (b) of Article 15(3) and the second subparagraph of Article 16(1).
[647] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(3)-(5).
[648] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(3)(a)-(b).

annual report.[649] The contents of the annual report are also outlined, but generally comply with the requirements of accounting rules in the jurisdiction where the AIF is based.[650] Article 24(3) requires that these reports must be provided to a competent authority of a home Member State on request.

Additional data that assists in the monitoring of systemic risk is addressed in Article 24(5), which further provides that additional requests for information may be made of an AIFM by a competent authority of a home Member State if it believes the additional request for information is in the interests of monitoring systemic risk. If such a request is made, ESMA must be informed of the additionally imposed requirements.[651] Further, in exceptional situations where financial stability or sustainable long-term growth is of concern to the home Member State, ESMA is entitled to require the competent authority of the Member State to impose additional reporting requirements.[652]

Data relating to leverage includes the requirement that AIFMs must capture and maintain information concerning the degree to which leverage is employed by each AIF if it is employed on a substantial basis. This leverage figure must also be broken down between leverage in the form of borrowing of cash or securities and leverage employed through the use of over-the-counter (OTC) and other derivatives products, identifying the five largest

[649] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 22 provides for annual AIF reports.
[650] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 22(1)-(3).
[651] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(5).
[652] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(5).

sources of leverage.[653] Further, the AIFM must be able to demonstrate the extent to which the assets of the funds it manages have been reused under leveraging arrangements.[654] However, at no point does the wording of the obligation elaborate any further on how to define leverage or how to clarify exactly what a leveraging arrangement is. At this stage, the wording merely creates a framework for monitoring and reporting clear micro and macro systemic risks. However, by means of a delegated act adopted by the European Commission,[655] there have been further specifications on when leverage is to be employed and used on a substantial basis and how to fulfil the reporting obligations of Article 24.[656] This detail is found in the Alternative Investment Fund Managers Regulation (AIFMR).[657]

4.2.2.2. Detailed reporting requirements of AIFMR

Chapter V of AIFMR addresses disclosure requirements and, pursuant to Article 110, provides that every AIFM must provide a breakdown of the main financial instruments that the funds it manages invest in. The AIFM must further detail each AIF's investment strategy in doing so. It must also report on the geographic and sectoral breakdown of its investments in pursuing the relevant investment strategy.[658] Additionally, this must be supplemented by

[653] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(2)(4).
[654] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Recitals 49 and, 80 and Article 24(4).
[655] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Pursuant to Articles 56, 57 and 58.
[656] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(6)(a)-(b).
[657] Regulation (EU) No 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, [2013] OJ L83/1.
[658] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(1)(a).

information on the specific markets[659] being traded by each AIF under management, as well as evidence of the diversification within the portfolio in relation to its principal exposures and concentrations.[660]

AIFMR also provides that AIFMs must capture and report the percentage of each AIF's assets, subject to special arrangements[661] due to their illiquid nature, and any new methods employed to manage fund liquidity.[662] The systems used to monitor market risk, liquidity risk, counterparty risk and operational risk must all be outlined clearly.[663] Risk profiling of all AIFs must be undertaken, reactions to risk stimulus, investment profiles, redemption profiles, expected returns to risk, volatility ranges, shorting arrangements performance data, and stress testing scenarios and results must all be captured and reported.[664]

AIFMR continues that information must be provided on the main asset categories of each AIF, and that this includes all long and short positions, with associated turnover and

[659] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(1)(b).
[660] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(1)(c).
[661] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(2)(a).
[662] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(2)(b).
[663] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(2)(c).
[664] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(2)(d)(i)-(ii).

performance data for the reporting period.[665] Periodic stress testing must also be undertaken on this data.[666]

The above information required by Article 110(1)-(2) must be compiled and reported by AIFMs in ESMA's predetermined template on a half-yearly basis, if the AIF's assets under management exceed the threshold of either €100 million for hedge funds or €500 million for private equity funds but do not exceed €1 billion.[667] There is a quarterly reporting obligation if the AIF's assets under management exceed €1 billion.[668] The reporting obligation is also quarterly if an AIF's total assets under management, including any assets acquired through the use of leverage, exceed €500 million, in respect of that AIF.[669] There is an annual reporting obligation frequency in respect of an unleveraged AIF, such as a private equity fund, which invests in non-listed companies and issuers for the sole purpose of acquiring control.[670]

However, under Article 110(4), a national competent authority has the power to determine that, in order to perform its function as a regulator, it is appropriate for AIFMs to report information on a more frequent basis than what is outlined above in Article 110(3).[671] Article

[665] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(2)(e).
[666] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(2)(f).
[667] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(3)(a).
[668] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(3)(b).
[669] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(3)(c).
[670] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(3)(d).
[671] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(4).

110(4) simply states that '[b]y way of derogation from paragraph 3, the competent authority of the home Member State of the AIFM may deem it appropriate and necessary for the exercise of its function to require all or part of the information to be reported on a more frequent basis.' Therefore, there is a pre-existing mechanism within AIFMD for higher frequency reporting. This gives rise to the possibility for reporting to be transferred to a real-time model. However, it is at the instigation and discretion of the competent authorities of each Member State.

AIFMs that manage one or more AIFs that employ leverage on a substantial basis, as per the definition contained in Article 111, must report the information required by Article 24(2).[672] Article 111 provides that the substantial basis means the calculation of leverage in accordance with what is known as the 'commitment method'. Article 8 of AIFMR details this calculation methodology, but the focus is on turning exposures of derivatives into an equivalent position in the underlying asset.[673] AIFMs must provide the requisite information in accordance with the pro forma reporting template set out in Annex IV.[674] Annex IV of AIFMD Level 2 contains the suggested reporting template.[675]

From its investigation of the Level 2 Regulation wording, this thesis makes some important observations regarding regulatory reporting. Firstly, AIFMR is implemented by way of Regulation, thereby having a direct effect across Member States. In effect, Article 110's

[672] Regulation (EU) No 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, [2013] OJ L83/1, Article110(5).
[673] Regulation (EU) No 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, [2013] OJ L83/1, Article 8(2)(a).
[674] Regulation (EU) No 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, [2013] OJ L83/1, Article 110(6).
[675] Regulation (EU) No 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, [2013] OJ L83/1.

wording is identical to the domestic laws of each Member State. It also ensures that, in turn, the reporting template remains identical across Member States. Secondly, national competent authorities are given specific authorisation to deviate from these rules in specific circumstances. As noted above in respect of Article 110(4), a national competent authority may make an assessment that it would be appropriate to introduce more frequent or more intrusive requirements. To facilitate more thorough or rigorous requirements, such a provision could open the door to real-time reporting with minimal additional regulatory wording change in AIFMD. Therefore, Level 2 sets a maximum level of harmonisation across the EU and thereby ensures that its strength as a measure to combat systemic risk is not diminished by Member State-level discretion.

As reiterated throughout the chapter and across the thesis, this research is focused on the requirement for disclosure of information that can contribute to the identification and combatting of systemic risk. Furthermore, it is focused on evaluating the extent to which the frequency of reporting inhibits the identification and combatting of systemic risk. In supporting the argument of this part, the next section will identify the elements of the reporting obligation contained in the Annex IV template, which could be viewed as weaknesses and which could potentially have a profound impact on the effectiveness of systemic risk monitoring.

4.2.3. Annex IV summary

Comparing the U.S. and EU approaches to hedge fund regulation is informative because both jurisdictions sought to increase transparency and monitor systemic risk in the aftermath of the

global financial crisis. Understanding the U.S. experience provides context for the objectives and mechanisms that shaped the EU's AIFMD framework.

Although not the primary focus of this summary, it is instructive to examine the introduction of hedge fund regulatory reporting in the U.S. just prior to the approval of the AIFMD in the EU. In 2010, the U.S. regulatory system was overhauled by the Dodd-Frank Act, with a major emphasis on disclosure of opaque investment vehicles and practices.[676] Part of the overhaul included a focus on private funds relying on the Section 3(c)(1) or 3(c)(7) exemption from registration as investment companies under the Investment Company Act, 1940.[677] Such vehicles were generally managed by registered investment advisors, but their reporting did not include private fund elements. Pursuant to Dodd-Frank requirements, the Securities and Exchange Commission (SEC), which regulates the securities markets, and the Commodities Futures Trading Commission (CFTC), which regulates the derivatives markets, were required to introduce regulatory reporting rules for SEC or CFTC-registered investment advisors to private funds that had no reporting requirements because of the exemption they relied upon. Therefore, Form PF was introduced as a requirement on the investment advisor for fund vehicles that it managed. Form PF was introduced as the method by which investment advisors would submit data sets to the Financial Stability Oversight Council (FSOC),[678] which was set up under Dodd-Frank to perform the single task of ensuring US financial market stability. Hence, the ultimate purpose of the Form PF reporting requirements was to enable FSOC to make assessments about systemic risk.[679]

[676] Dodd-Frank Wall Street Reform and Consumer Protection Act, 2010, commonly referred to as Dodd–Frank. This act of the US Congress was enacted on July 21, 2010. This act was introduced in the aftermath of the 2007 financial crisis in response to widespread calls for increased regulation of the financial services industry. The purpose of Dodd–Frank was to improve US financial stability and consumer protection. It introduced many rules, such as the Volker rule, that placed limits on the risk-taking of banks.
[677] Investment Company Act, 1940.
[678] FSOC was set up under Dodd-Frank to perform the single task of ensuring US financial market stability.
[679] Dodd-Frank Wall Street Reform and Consumer Protection Act, 2010, Sections 404 and 406.

In January 2011, Form PF was introduced, which created a template for investment advisers to submit data which regulators aggregated to determine if private funds or their investment advisors were posing a systemic risk.[680] This regulatory development reflected a concern around obtaining consistent and comparable data to monitor potential systemic vulnerabilities within private funds. While the US approach centred on a single federal filing to support systemic risk oversight, similar regulatory concerns were emerging in Europe. Later in 2011, AIFMD's mandatory disclosure regime was delivered through Annex IV, the template containing all data set reporting obligations to be implemented by all EU Member States. Annex IV of AIFMD concerns the provision of information concerning the marketing of an AIF outside its home Member State into other EU Member States. In the context of the AIFMD mandatory disclosure regime, the reference to Annex IV reporting refers to the reporting template found in Annex IV of AIFMR. This 25-page template must be used by all reporting entities.[681] Unlike Form PF, which directs data to be submitted to a single US federal regulator, the Annex IV framework embeds these reporting obligations within the complexity of the EU's multi-jurisdictional regulatory architecture.

4.2.3.1. Fostering harmonisation in Annex IV through ESMA guidance

[680] Ropes & Gray Alert (October 2014), "Regulatory Reporting Under AIFMD – an Update and Comparison to SEC's Form PF", London. It is worth noting that whilst neither the EU nor the US have said they based their rules on discussions or modelled wording on the others' set of requirements, each has referred extensively to the others' reporting template. However, global hedge fund bodies have encouraged an alignment initiative. This alignment is due to the current internationalisation of the hedge fund industry. Identifying and combatting systemic risk is most effective if done on an aligned global scale. However, neither ESMA nor the SEC have affirmed that their rules on discussions or modelled wording were based on each other's set of requirements. Nonetheless, each has referred extensively to the others' reporting templates. The key differences whereby ESMA diverges from the SEC relate to risk methodologies, the embedding of derivatives in leverage assessments, stress testing approaches, rehypothecation of collateral, and the granularity of where risk is concentrated.

[681] Regulation (EU) No 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, [2013] OJ L83/1, p. 71-95.

Annex IV's required data sets are extremely complex and subject to definitional interpretation. To assist with the interpretation and implementation of these regulatory reporting obligations, guidelines were published to explain issues such as the means of calculation of each required disclosure.[682] The ESMA guidelines are updated periodically and published to ensure a common, uniform, and consistent application of AIFMD's reporting obligations by AIFMs across Member States. The guidelines contain specific worked examples of reporting obligations, instructions for completing the Annex IV reporting template, and the calculation of exposures and limits. These guidelines are to be incorporated by national competent authorities into their supervisory regimes.[683] However, ESMA has allowed for deviation from these guidelines on a 'comply or explain' basis.[684]

ESMA also periodically updates a non-legally binding set of Questions & Answers.[685] The purpose of this document is to further enhance the common supervisory approaches and practices necessary to effectively apply AIFMD across the EU. By answering questions from industry and regulators on issues regarding the practical implementation of AIFMD, ESMA's Questions & Answers achieves its purpose of being a convergence tool.[686] Section III is devoted to reporting questions. Such questions concern *inter alia* confirmation of reporting dates, elements included in calculations, application to non-EU AIFMs, and how to complete the Annex IV template.

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[682] ESMA, 'Guidelines on reporting obligations under Articles 3(3)(d) and 24(1), (2) and (4) of the AIFMD, ESMA/2014/869EN' 8th August 2014, available at: https://www.esma.europa.eu/document/guidelines-reporting-obligations-under-articles-33d-and-241-2-and-4-aifmd (date accessed: 5 January 2026).
[683] *Ibid*., para 5.
[684] *Ibid*., para 7.
[685] ESMA, 'Questions and Answers, Application of AIFMD' 5 October 2017, available at: https://www.esma.europa.eu/sites/default/files/library/esma34-32-352_qa_aifmd.pdf (date accessed: 5 January 2026).
[686] D. Zetzsche, 'The Anatomy of European Investment Fund Law' in W. Birdthistle and J. Morley (eds), *Research Handbook on the Regulation of Mutual Funds* (Edward Elgar Publishing, 2018).

EU-wide guidance applicable to all Member States ensures consistency of application across the EU and the accompanying international coordination of standardisation.[687] This consistency is crucial to the development of a coherent mandatory disclosure regime that can fulfil the mandate of identifying and combatting a cross-jurisdictional challenge of systemic risk.

Annex IV builds upon this purpose by requiring data sets to be disclosed by AIFMs to the regulator for every AIF that they manage. The origins of AIFMD's purpose may be found in political motivation.[688] However, that does not diminish the value of this objective in any way or the manner in which it is provided for through a mandatory disclosure regime. The EU has proved this by diverging from the US Form PF model in terms of risk definitions, calculation methodologies and market structure.

4.2.3.2. AIFMD Reporting through Annex IV

For ESMA to aggregate data within the hedge fund industry, data sets submitted by hedge funds must be made in a uniform format. Therefore, to ensure the uniformity of the reporting process across Member States, ESMA has created a reporting template that all AIFMs must adhere to.[689] This template consists of four types of data sets. Firstly, AIFM-specific information, as provided for under Article 24(1). This is largely stationary data concerning the AIFM and includes reporting codes, flags, identifiers such as Legal Entity Identifiers

[687] H. Marjosola, 'Regulating Financial Markets under Uncertainty: The EU Approach' (2014) 39(3) *European Law Review* 338.
[688] House of Lords, *supra* note 16. Chapter 4: The EU Financial Regulatory Framework in Detail.
[689] Regulation (EU) No 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, [2013] OJ L83/1, Annex IV. Also, see ESMA Approved AIFMD Reporting Format, available at: https://www.esma.europa.eu/sites/default/files/library/2015/11/2013-1359_consolidated_aifmd_reporting_template-v1.1_revised.xlsx (date accessed: 5 January 2026).

(LEI) and Bank Identifier Codes (BIC), and reporting assumptions. Elements of this information that are updated each reporting period include dates, the top five principal markets traded in on behalf of AIFs, the top five instruments traded on behalf of AIFs, and the assets under management (AUM) value of each AIF.[690]

The second data set required is AIF-specific information, as requested under Article 24(1). This includes additional stationary or static data concerning the AIF, such as reporting codes, flags, and identifiers of the fund, which are requested from the Committee on Uniform Securities Identification Procedures numbers (CUSIP) to International Securities Identification Numbers (ISIN).[691]

Share class identification codes are also required to be submitted, along with details of the master fund that any feeder fund flows into. Data must also be submitted in relation to any prime brokers used, the base currency of the fund, the top three jurisdictions where funds are sourced, a breakdown of the investment strategy of each AIF, the top ten principal exposures, the five most important concentrations of each AIF, and the geographical focus of each AIF.[692]

The third data set required is AIF-specific information as requested under Article 24(2). This includes data surrounding the investments traded by each AIF and their individual exposures across all asset types. Further, the turnover value in these asset types must be reported for the period. Both the long and the short positions must be detailed. The risk profile of each AIF must be outlined, with specific data being submitted concerning the top five counterparty

[690] Guidelines on reporting obligations under Articles 3(3)(d) and 24(1), (2) and (4) of the AIFMD, ESMA/2014/869EN, 8th August 2014. p. 9-12.: available at: https://www.esma.europa.eu/sites/default/files/library/2015/11/2014-869.pdf (date accessed: 5 January 2026).
[691] *Ibid*.
[692] *Ibid*., 12-22.

exposures of each AIF. Data must also be submitted surrounding the liquidity profile of each AIF, investor redemptions, special arrangements and preferential treatment, and a breakdown of the ownership of the units in each AIF.[693]

The fourth set of data required is AIF-specific information as requested under Article 24(4). This includes information on rehypothecation, borrowing and exposure risks of each AIF, leverage limits used, and the top five sources of borrowed cash or securities.[694]

Before turning to these data sets in detail, it is necessary to clarify their relationship to the Annex IV reporting categories identified above. The four data sets outlined in subsection 4.2.3.2 reflect the formal legal structure of Annex IV reporting as set out in Articles 24(1), 24(2) and 24(4) AIFMD. By contrast, subsections 4.2.3.3 to 4.2.3.6 do not introduce additional or separate reporting obligations. Rather, they reorganise the same Annex IV data set disclosures into functional groupings — namely, fund overview data, fund trading activity data, fund risk profile data and fund expected return data — in order to analyse how the information reported under Annex IV is utilised by regulators for the purposes of systemic risk monitoring and market oversight.

4.2.3.3. Fund overview data set

Reporting data often represents a snapshot in time. Annex IV provides for certain data sets to be reported, which represent the position at a point in time for the funds managed. These key indicators of risk and exposure are central to how aggregated data represents the state of the

[693] *Ibid*., 22-31.
[694] *Ibid*., 31-56. Also, see AIFMD Regulatory Reporting, Irish Funds Industry Association, August 2014, available at: https://files.irishfunds.ie/1433089309-2014-8-Guide-aifmd-reporting-guide-presentation.pdf (date accessed: 5 January 2026). M. McDonald, 'Containing Systemic Risk: New Developments in Trans-Atlantic Hedge Fund Regulation' (2011) 34 *Loyola of Los Angeles International and Comparative Law Review* 237.

hedge fund industry. The data sets reported include data around assets under management (AUM), net asset values (NAV), beneficial owners, special arrangements, borrowings, and rates of return.[695]

Under Annex IV, an AIFM has an obligation to report the AUM of each AIF that it manages.[696] The calculation of AUM for the purposes of this report is the fund's total exposures. This includes assets at their gross value and derivative positions, which are valued in accordance with a pre-set conversion methodology. The conversion usually equates to the notional value or underlying market value of the reference assets.

Under Annex IV, an AIFM is required to report the strategy that each AIF is following, providing a 'percentage of NAV' breakdown where the fund is following multiple strategies concurrently.[697] Moreover, under Annex IV, an AIFM is required to identify the beneficial owners of the shares issued in each AIF that it manages. Data must then be produced and reported to verify: (i) the top 10 exposures and top five largest portfolio concentrations; (ii) professional clients or retail investors; and (iii) various categories of investors such as insurance corporations and pension plans.[698] Obtaining information on ultimate beneficial owners can be difficult if an investment is through fund-of-fund structures or omnibus accounts, and therefore, such data is reported only where it is known.[699]

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[695] Regulation (EU) No 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, [2013] OJ L83/1, Recitals 72, 77, 86, 90, and 91.
[696] Regulation (EU) No 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, [2013] OJ L83/1, p. 71.
[697] Regulation (EU) No 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, [2013] OJ L83/1, p. 72-73.
[698] Regulation (EU) No 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, [2013] OJ L83/1, p. 74-78.
[699] A fund-of-fund structure is where an investor invests into a fund in its own name, which, in turn, invests in its own name into another fund. No underlying investor names into the underlying fund are released to the receiving fund (the fund-of-funds). An omnibus account is the same concept for a direct investment into a fund.

Further, under Annex IV, an AIFM is obliged to report the percentage of each AIF's NAV that is subject to a special arrangement or preferential treatment.[700] A special arrangement can include, but is not limited to, a side pocket, an investment gate provision, or a provision suspending dealing when assets become illiquid. Preferential treatment can include, but is not limited to, arrangements granted to investors such as different reports, different liquidity terms, or different fee structures.

In relation to borrowing, Annex IV provides that an AIFM is obliged to report the total borrowings of each AIF that it manages.[701] This includes all cash financing, both drawn and undrawn, which the fund has access to, plus any borrowings embedded in derivatives products traded. If the financing has yet to be drawn down, the AIFM must report details about how long the financing facility is available to the AIF.

Further to borrowing, under Annex IV, an AIFM must report the leverage of each AIF that it manages.[702] Leverage must be calculated using two industry-accepted methodologies: the gross method and the commitment method. The difference between these two methodologies for determining leverage is that the gross method does not take into account any netting or hedging of positions, whereas the commitment method does.

Investors first pool their funds in a single omnibus account in their own names, and the omnibus account is the named investor into the fund.

[700] Regulation (EU) No 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, [2013] OJ L83/1, p. 90.

[701] Regulation (EU) No 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, [2013] OJ L83/1, p. 91.

[702] Regulation (EU) No 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, [2013] OJ L83/1, p. 92.

Under Annex IV, an AIFM is obliged to report the monthly gross return or Internal Rate of Return for each AIF that it manages.[703] This calculation is gross of management and performance fees.

4.2.3.4. Fund trading activity data set

A second data set that is necessary for assessments to be made about the risk exposure of the market to hedge funds relates to the activity that funds are engaging in. Reported and aggregated trading patterns and strategies can provide useful information in relation to burgeoning systemic risks.[704]

Under the strategy section of the Annex IV template, AIFMs are required to report the total number of high-frequency trades (HFT) executed and their corresponding market value of the buys and sells for each AIF that it manages.[705] Further, under Annex IV, an AIFM is obliged to report the value of turnover in the fund's base currency for each AIF that it manages.[706] This means that the AIFM must report the total sum of the market values of all buy trades and all sell trades of assets and notional values of derivatives during the period of the report. [707]

[703] Regulation (EU) No 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, [2013] OJ L83/1, p. 86, 92-93.
[704] Regulation (EU) No 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, [2013] OJ L83/1, p. 72 – 77.
[705] Regulation (EU) No 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, [2013] OJ L83/1, p. 73.
[706] Regulation (EU) No 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, [2013] OJ L83/1, p. 71-72.
[707] Regulation (EU) No 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, [2013] OJ L83/1, p. 80, 84.

An AIFM is also obliged to report on trading and clearing mechanisms. This requires the AIFM to provide details on whether securities and derivatives were traded on a regulated exchange or OTC, volumes traded, and market values.

Further, under Annex IV, an AIFM is obliged to report the value of total cash borrowings. This is the total of unsecured and secured cash borrowing, all collateralised or secured cash borrowing via a prime broker, or collateralised or secured cash borrowing through a repo or reverse repo trade. Any borrowings through the use of embedded derivatives must also be reported.

4.2.3.5. Fund risk profile data set

Existing positions and exposures within the financial markets are an important indicator of where risk lies. This information can indicate where concentrations of risk exist. Under Annex IV, an AIFM is obliged to report data on the fund's long and short exposures.[708] A list of the top 10 exposures must be submitted, detailed by sub-asset type and by currency of the exposure. These exposures are calculated in accordance with ESMA's guidance on the meaning of sub-asset type, which clarifies that cash should be included in the submission. However, loans held by the fund as assets should only be reported at their notional value and not at their market value.

Also, under Annex IV, an AIFM must report details of the mark-to-market value of collateral and other credit support, divided by cash, securities and other collateral, including letters of

[708] Regulation (EU) No 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, [2013] OJ L83/1, p. 78-83.

credit, posted to counterparties, as at the last business day of the reporting period.[709] This is understood to mean all collateral held by counterparties, as opposed to the amount of collateral held that is equal to margin requirements. Under AIFMD, an AIFM is obliged to report the total unhedged long and short exposures by currency and convert them into the base currency of the fund itself for all of the AIFs that it manages. Also, under Annex IV, an AIFM is obliged to capture the following risk data for the AIFs that it manages: (i) Net Equity Delta; (ii) Net DV01 in <5yrs, 5-15yrs and >15yrs maturity buckets; and (iii) Net CS01 in <5yrs, 5-15yrs and >15yrs maturity buckets.[710] The results of these risk measures must be reported on the Annex IV Reporting template. Further to this, under Annex IV, a regulator is empowered to request an AIFM to report the results of VaR testing which it has calculated for any purpose whatsoever. Under Annex IV, an AIFM is obliged to report details of the top five mark-to-market counterparty exposures by percentage of NAV for each AIF that it manages.[711] This calculation must be the net total of any collateral posted and must include counterparties to which the fund is exposed and counterparties that are exposed to the fund. Annex IV also requires an AIFM to report stress testing results and provide the results of stress tests. Non-European Economic Area AIFMs are not subject to these reporting requirements. This stress testing requirement is crucial as part of systemic risk monitoring to gain broader views of potential market vulnerabilities. Lastly, under Annex IV, an AIFM is obliged to report the percentage of collateral rehypothecated by counterparties holding the collateral.[712] The systemic risk connected to rehypothecation is an increasing risk as more

[709] Regulation (EU) No 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, [2013] OJ L83/1, p. 87.
[710] Regulation (EU) No 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, [2013] OJ L83/1, p. 70.
[711] Regulation (EU) No 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, [2013] OJ L83/1, p. 88.
[712] It is unclear if this calculation needs to be performed as an average over the reporting period or per the last day of the reporting period.

counterparties use solutions such as the repo market, where they pledge collateral for access to credit.

4.2.3.6. Fund expected return data set

When regulating for systemic risk, a regulator may be predisposed towards looking to the future and attempting to predict accumulation and materialisation. It is therefore crucial that part of the mandatory disclosure requirements of firms be focused on predictive data sets. Under Annex IV, an AIFM is obliged to submit several different predictive data sets. Firstly, an AIFM must submit its expected annual investment return or internal rate of return under what it considers normal market conditions.[713] AIFMs have flexibility in their reporting obligations and may calculate an expected return based on either prior performance and market conditions, or they may report a targeted return. Secondly, an AIFM is obliged to calculate the percentage of each AIF's portfolio that is reasonably capable of being liquidated at its carrying value.[714] This liquidation must be possible within a specific time period. This obligation also includes the reporting of unencumbered cash within the fund's bank accounts. Thirdly, an AIFM is obliged to calculate the percentage of each AIF's NAV that its investors are entitled to redeem within a specified liquidity time period.[715] An AIFM may impose gates where it is entitled to do so to ensure the liquidity of the fund.

[713] Regulation (EU) No 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, [2013] OJ L83/1, p. 92.
[714] Regulation (EU) No 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, [2013] OJ L83/1, p. 89.
[715] Regulation (EU) No 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, [2013] OJ L83/1, p. 89.

4.2.4. The reporting weaknesses identified by the AIFMD II proposal

Having outlined the requirements of Annex IV, this section now turns to its identified weaknesses, focusing primarily on the AIFMD II proposal and its potential to address these shortcomings. In doing so, the analysis will examine how the proposed amendments seek to overcome the limitations of the original AIFMD, providing a foundation for evaluating whether the final approved text of AIFMD II is likely to effectively resolve the weaknesses. It will be demonstrated that AIFMD does not have the ability to achieve its self-stated purpose of identifying and combatting systemic risk. The bigger concern for systemic risk is that the Annex IV mandatory disclosure regime does not accurately request all relevant data sets. It is incomplete in its ability to use submitted data to analyse systemic risk. Furthermore, the regime does not operate on the right timeframe to be able to identify and combat systemic risk in a way to neutralise it. However, AIFMD II may provide an avenue to address these weaknesses and move closer to this outcome, specifically by ESMA developing regulatory and implementing technical standards at Level 2.

In the explanatory memorandum to the AIFMD II proposal,[716] the European Commission specifically referred to the key objective of the revised Directive as being the improvement of reported data and macro-prudential supervision in the interests of financial stability.[717] It is within this context that the proposal identified several reporting issues to be addressed in

[716] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final; available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52021PC0721 (date accessed: 5 January 2026).
[717] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final, 2.

order to deliver an 'integrated data collection system that would deliver accurate, comparable, and timely data to European and national supervisory authorities.'[718]

The explanatory memorandum and recitals to the proposal identified several weaknesses in the Annex IV reporting regime. These weaknesses are categorised into four main themes. Firstly, the lack of effective macro-prudential monitoring and supervision due to the lack of granularity of reported data sets.[719] Annex IV had limitations on the scope of exposures required to be reported. Only the largest exposures and counterparty trades were captured by the reporting requirement.[720] From a supervisory perspective, the problem is that data sets were incomplete, and hence, there could be too much potential deviation in deriving appropriate actionable intelligence. As argued in this thesis, from a supervisory perspective, the problem is that accuracy and completeness require a full portfolio of data to be reported in all its granularity.

Secondly, the proposal recognised duplication of reporting and a need for increased standardisation and coherence across EU financial services reporting regimes.[721] The weakness concerns the poor alignment and reporting synergy needed to identify and combat systemic risk. European Supervisory Agencies (ESAs) together with the European Central

[718] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final, 4.
[719] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final, 2.
[720] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final, Recital 17.
[721] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final, Explanatory Memorandum. Also, see Article 20b(1)(a) and 69b(2)(a).

Bank (ECB) and national competent authorities 'should assess the data needs of the different supervisory authorities so that the changes to the supervisory reporting template for AIFMs are effective.'[722] The example used in the proposal was the poor synergy between the AIFMD and UCITS reporting regimes, the two halves of the asset or fund management industry. An extension of this reporting inefficiency can be seen in the reporting of overlapping data to respective regulatory authorities.[723] The view of this thesis is that to achieve greater standardisation and harmonisation of reporting obligations across EU Regulations, more power should be delegated to the Commission to adopt regulatory and implementing standards drafted by ESMA.[724]

Thirdly, the Annex IV reporting template and reporting process are now a decade old and in need of updating and streamlining in order to 'improve efficiency and reduce administrative burdens for AIFMs.'[725] As has been referred to by this research, the validation of data set identifiers, the calculation methodologies used, the data consistency checks, and the technological solutions used by AIFMs to complete and submit reports have all developed over the past decade.[726]

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[722] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final, 2, 11. See Recital 16.

[723] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final, 10.

[724] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final, Recitals 18-19.

[725] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final, Recital 16.

[726] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final. See reference to changing digital environment under Regulatory fitness and simplification. See reference to issues of consistency of information in recital 18. See reference to more effective use of standardised data from the reporting process in Recital 32.

Fourthly, the AIFMD II proposal stated that 'the information gathering and sharing through supervisory reporting could be improved.'[727] This is a critical issue as systemic risk can only be identified and combatted at a cross-sectoral and cross-jurisdictional level. Therefore, information gathering and sharing are core to AIFMD fulfilling its self-stated purpose of ensuring financial stability.

Interestingly, the observed weaknesses addressed in the AIFMD II proposal do not directly state that the frequency, timing and format of the submitted reports are a primary concern. However, it is the argument of this thesis that the first fundamental problem with AIFMD's ability to identify and combat systemic risk lies in the frequency of reporting. It is not clear why this is not expressly addressed in the amendments, but since harmonisation and standardisation are at the heart of the proposal, it could be argued that the proposal focuses on existing areas of divergence between Member States and between connected regulatory regimes such as UCITS and AIFMD. Currently, there is harmonisation and standardisation in relation to reporting frequency and timing of reporting. Hence, it may not have been seen as an area that needed change.

However, through the lens of identifying and combatting systemic risk, this thesis points to its omission as a significant issue at the centre of whether AIFMD can achieve its self-stated purposes. For instance, annual, semi-annual or quarterly reporting takes time to process. ESMA has acknowledged that it has issues with the accuracy, completeness and timeliness of

[727] Proposal for a Directive of the European Parliament and of the Council of 25 November 2021 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds COM(2021) 721 final, Recital 16.

data collected,[728] particularly as ESMA refers to the accuracy, completeness and timeliness of information provided by each AIFM for the AIFs it manages.

4.3. Changes introduced by AIFMD II

This part will be divided into three sections. The first section will outline the structure of AIFMD II. The second section will provide an overview of the changes introduced by AIFMD II in relation to reporting. The third section will synopsise other changes introduced by AIFMD II. This part will argue that these approved changes represent a significant step forward in solidifying how the Annex IV requirements are being oriented towards more effective reduction of systemic risk.

AIFMD II was published in the Official Journal of the European Union on 26th March 2024 and entered into force on 15th April 2024.[729] This means that AIFMD II will fully apply EU-wide from 16th April 2026. Member States were given a 24-month transposition period before coming into effect once approved. ESMA will have a 36-month period to draft its technical standards.[730] Therefore, at the time of submitting this thesis, it will still be another year before the current reporting regime sees any meaningful change.

[728] ESMA, 'ESMA Report on Trends, Risks and Vulnerabilities No. 1, 2018' p. 40, available at: https://www.esma.europa.eu/sites/default/files/library/esma50-165-538_report_on_trends_risks_and_vulnerabilities_no.1_2018.pdf (date accessed: 10 January 2026).
[729] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj.
[730] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 24('5a)-('5b), Article 20a(5)-(6) and Article 3(1).

The changes introduced by AIFMD II apply to a broad range of topics. However, this part will concentrate on the most salient aspects with respect to systemic risk, particularly reporting, but also delegation and loan origination. Each of these will be addressed in turn to demonstrate how AIFMD is being improved and strengthened in order to better identify and combat systemic risk. The objective of this analysis is to understand the scope for implementing new disclosure and reporting techniques, as well as the potential need for further legislative changes. Section 4.3.1 will assess the reporting changes. Changes to the UCITS reporting regime will be assessed in this section because AIFMD II also provides for amendments to the UCITS Directive.[731] This is a very appropriate inclusion as the asset management industry has always been made up of two halves – UCITS and AIFs (previously known as non-UCITS).

4.3.1. Structure of AIFMD II

Level 1 framework directives provide high-level changes and allocate the responsibility for providing more detailed Level 2 and 3 rules. Hence, AIFMD II is short and relatively simplistic in its form and content. Article 1 of AIFMD II introduces the changes to AIFMD. Article 2 introduces changes to the UCITS Directive. Both of these provisions will be addressed below. This analysis of the changes introduced by AIFMD II highlights how the amendments aim to strengthen the asset management industry by addressing the key risk categories that contribute to systemic risk.

[731] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 2.

It is important to recognise the relevance of the Annexes to AIFMD II. However, while the Annexes are not essential to the review of systemic risk or mandatory reporting, the Annexes are being summarised here to provide a complete assessment of AIFMD II Annexes. Annex I now explicitly adds loan origination and servicing securitisation special purpose entities to the 'other function' that an AIFM may perform, meaning AIFMs must understand these expanded roles to ensure compliance and avoid regulatory risk.[732] Annex II inserts a new Annex V into AIFMD. Annex II provides a list of nine liquidity management tools that an open-ended AIFM may use and which include (1) suspension of subscriptions, repurchases and redemptions, (2) redemption gates, (3) extension of notice periods, (4) redemption fees, (5) swing pricing, (6) dual pricing, (7) anti-dilution levy, (8) redemptions in kind, and (9) side pockets.[733] Annex IV lists the same set of liquidity management tools for UCITS funds.[734] Annex III has new wording concerning procedures and conditions for the repurchase and redemption of units in the fund. It also details the circumstances in which subscription, repurchase and redemption may be suspended or other liquidity management tools activated.[735]

4.3.2. Regulatory reporting amendments

[732] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Annex I.
[733] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Annex II.
[734] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Annex IV.
[735] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Annex III.

The most relevant AIFMD II changes for this research are the changes to the reporting regime. Article 24 of AIFMD, on reporting obligations to competent authorities, is amended to require an AIFM to report all markets, instruments and exposures of the AIF it manages instead of just the top 5.[736] It must also report the market risk, liquidity risk, counterparty risk, operational risk, leverage employed by the AIF, and delegation arrangements concerning portfolio or risk management. The information concerning the delegation of portfolio or risk management must include delegate names, domicile, full-time staff needed to monitor delegates, human and technical resources to monitor the delegation, details of due diligence carried out as part of the delegation, commencement and expiry dates of the delegation and sub-delegation arrangements, and more granular details on functions sub-delegated.[737]

The high-level changes to the wording of the AIFMD at Level 1 will need to be further developed in detail through a Level 2 Regulatory Technical Standard (RTS). Changes to the Annex IV reporting template and its reporting format will need to be detailed in an Implementing Technical Standards (ITS). Therefore, much of the Level 2 detail in RTS and ITS under AIFMD II is not yet available and remains delayed at the time of submitting this thesis. The ITS and RTS requirements will apply from 16 April 2027, and a revised Annex IV template is due to be published in advance of that date.[738] This timeline will help define a set of amendment options for implementing real-time reporting, which can then inform the design of existing circuit breaker regimes discussed in Chapter 5.

4.3.2.1. Level 1 reporting changes

[736] AIFMD art. 24(1) as amended by AIFMD II art. 1(12)(a).
[737] AIFMD art. 24(2) as amended by AIFMD II art. 1(12)(b).
[738] AIFMD art. 24(5) as replaced by AIFMD II art. 1(12)(d).

Article 24 of AIFMD is dedicated to reporting requirements. Article 1(12) of AIFMD II updates the reporting requirements in several key ways. Article 24(1) is replaced by Article 1(12)(a), in which amendments require a report to be made on all markets in which the AIFM trades, rather than just principal markets.[739] It also requires reporting in markets where the AIFM is a member rather than just markets where the AIFM has traded. It also requires the reporting of all exposures rather than just the principal exposures. As was explained in the earlier chapters, systemic risk can be the accumulation of smaller risks as well as the crystallisation of larger risks. By only reporting the largest risks, the potential impact of smaller exposures of a fund may risk ignoring systemic risk triggers. The significance of the Level 1 changes is that the reporting of smaller exposures enables a more precise view of aggregation and the emergence of burgeoning risk in interconnected markets.

Article 24(2)(c)-(d) of AIFMD is replaced by Article 1(12)(b)(i) and now requires that reporting must reflect the total amount of leverage used by the AIF.[740] Also, delegation arrangements that concern portfolio or risk management must be reported. Such arrangements must include identification information of the delegates, number of full-time employees they have, a list and description of their activities concerning portfolio and risk management, the amount of assets subject to portfolio or risk management, the number of full-time employees at the AIFM that monitor the activities of the delegate, information relating to the due diligence carried out on the delegates and any concerns raised, any sub-delegation arrangements put in place, and details of the portfolio and risk management activities undertaken by the sub-delegates, the date of commencement and expiry of any sub-delegation arrangements.

[739] AIFMD art. 24(1) as replaced by AFIMD II art. 1(12)(a).
[740] AIFMD art. 24(2)(c)-(d) as replaced by AIFMD II art. 1(12)(b)(i).

As leverage is clearly connected to systemic risk, the monitoring of leverage is a crucial element of monitoring systemic risk in the market.[741] Delegation arrangements are very common in the investment industry. However, local or global exposure by delegating functions to unqualified or unresourced parties is a risk, especially when delegates may be more focused on making a fee from management or performance rather than the protection of assets.

Article 1(12)(b)(ii) inserts a new sub-section (f) into Article 24(2), which requires the reporting of a list of Member States in which units or shares of each AIF are marketed by the AIFM or a distributor acting on its behalf.[742] The significance of this data is that it facilitates the exchange of information between competent authorities. It also provides for the circumstances where Member States are connected through the distribution of AIFs. Finally, one of ESMA's core pillars is that it is enabled to fulfil responsibilities of safeguarding stability and recognising potential risks arising from connectedness.

Although not overtly apparent from the changes to Article 24 reporting contained in Article 1 of AIFMD II, there are arguably three overlapping themes in relation to changes introduced by AIFMD II to the Annex IV reporting regime, based on the non-legally binding recitals to the Directive. Whilst the recitals may not hold the same level of significance or statutory force as the Articles, they do provide an explanation of the objectives of the legislation.

Firstly, the changes seek to address the lack of accuracy or completeness of submitted data sets. This is about content and format. AIFMD II gives ESMA the power to broaden reporting obligations to include 'a full portfolio disclosure to supervisors on a periodic basis'

[741] See 1.5.3.
[742] AIFMD art. 24(2)(f) as inserted by AIFMD II art. 1(12)(b)(ii).

being made to supervisors.[743] This would mark a significant move away from the current reporting requirement, where only the very largest positions and exposures are reportable. Secondly, ESMA is given the power to adjust the content, forms and data standards, reporting frequency, and timing of reporting by AIFMs to create greater levels of standardisation.[744] Therefore, the reforms allow for an enhanced degree of implementation, progressing from a previous approach which was based on the set content and format for reporting of larger exposures. ESMA must suggest ways to reduce duplicate data, inconsistencies in reporting across the AIF and UCITS sectors, and overlapping data.[745] This will be done in conjunction with the European Central Bank and the other European Supervisory Authorities.[746] This will then feed into the establishment of the common data space envisaged under the Digital Finance Strategy, which applies cross-sectorally.[747]

Thirdly, AIFMD II provides mirrored updates to AIFMD and UCITS from a reporting perspective.[748] Systemic risk is not a single jurisdiction issue, nor is it a single sector issue. In order to ensure financial stability outcomes, a broader and more complete harmonisation and standardisation across AIFMD and UCITS reporting obligations should be undertaken to support the effective monitoring and sharing of industry data sets. AIFMD II states that '[t]o

[743] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 26.
[744] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recitals 27, 59 and 60.
[745] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 58.
[746] AIFMD art. 69-a as inserted by AIFMD II art. 25(2)(a).
[747] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a Digital Finance Strategy for the EU (COM/2020/591 final). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a European strategy for data (COM/2020/66 final).
[748] AIFMD art. 24 as amended by AIFMD II art. 1(12). Also, UCITS art. 20, as inserted by AIFMD II art. 2(7).

support market monitoring by the supervisory authorities, the information gathering and sharing through supervisory reporting should be improved by subjecting UCITS to supervisory reporting obligations.'[749] Therefore, the European Commission is acknowledging the alignment that needs to exist between the AIF and UCITS sectors of the asset or fund management industry.

4.3.2.2. Level 2 ESMA delegated responsibilities and delivery timelines

Article 24(5) is amended by Article 1(12)(c) to provide the authority for ESMA as follows:

> 'In exceptional circumstances, and where required in order to ensure the stability and integrity of the financial system or to promote long-term sustainable growth, ESMA after consulting the ESRB may request the competent authorities of the home Member State of the AIFM to impose additional reporting requirements.'

The rationale for this imposition is that it is in the interest of ensuring financial stability. Such an intervention can only be done after ESMA has consulted with the ESRB). The rationale for this change lies in the need to place systemic risk at the centre of the reporting, but to have additional input from the organisation, which has a specific mandate of ensuring financial stability. The partnership of ESMA and the ESRB means that the ESRB can advise ESMA and assist in its stress testing of systemic risk as ESMA prepares its advice to the European Commission.

[749] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 57.

Article 1(12)(d) inserts a new Article 24(5a) requiring ESMA to develop the draft regulatory technical standards (RTS) necessary to give effect to these changes. It also specifically gives ESMA the authority under Article 24(5a)(c) to specify the reporting frequency and timing. ESMA is given until 16 April 2027 to draft RTS for submission to the European Commission, who are empowered to adopt such to supplement AIFMD II. This is one of the key AIFMD II amendments of importance to this research.

ESMA is being given authority to propose the format, frequency and timing rules by which the abovementioned changes are introduced. ESMA can propose such changes to how reporting is done and how often it is submitted, without requiring that these changes be mandatory. Any deficiencies of the existing Annex IV reporting regime in monitoring or combatting systemic risk may now be addressed by the authority accorded to ESMA. Therefore, what ESMA does now at Level 2 may determine if AIFMD can achieve its own self-stated purposes or whether AIFMD continues to require reporting that can neither monitor nor combat systemic risk *ex ante*.

Article 1(12)(d) also inserts a new Article 24(5b) requiring ESMA to draft implementing technical standards (ITS) concerning (a) the format and data standards for reporting, (b) the identifiers needed for such data sets, (c) the method and arrangement for submission of reports which will improve the standardisation and efficient sharing of data between competent authorities, and (d) the template used for reporting purposes. These draft ITS must also be submitted to the European Commission by 16 April 2027, which is empowered to adopt them to support AIFMD II. The significance of this insertion is that it provides the mechanism by which format, frequency and timing can be changed by ESMA.

ESMA has been given the authority to draft an RTS which would allow a change in the frequency and timing of reports. However, the implementation format of these reports would be introduced by an ITS. The drafting of both of these rules has been delegated to ESMA with no limitation or restriction on what can be proposed to the European Commission. Hence, a significant window of opportunity exists to give AIFMD II the ability to allow the regime to achieve its self-stated aim of identifying and combatting systemic risk. ESMA will be given 36 months from the entry into force of the Directive to develop these technical standards.[750] ESMA then does not have to review these reporting requirements for another 60 months.[751]

As will be discussed in Chapter 5, a change in reporting format to a live feed and the change in frequency and timing to real-time can effectively be introduced in the coming years. However, it is not the Member State competent authorities, the European Commission or the ESRB that are at the centre of this opportunity. ESMA is central to how the Annex IV regime changes to ensure systemic risk is monitored and combatted within the investment industry going forward.

4.3.3. Other changes introduced by AIFMD II

Apart from reporting, there are various changes introduced by AIFMD II which are complementary in contributing to AIFMD II's enhancement of the existing framework. These other provisions may not be directed exclusively towards reporting, but they are integral to the reformed regime that AIFMD II is aiming to achieve. These provisions concern

[750] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 3(1).
[751] AIFMD art. 7(‘8) as inserted by AIFMD II art. 1(3)(d).

authorisation, conflicts of interest, delegation, depositaries, disclosure to investors, liquidity management, loan origination and marketing. Each will be briefly summarised in this section.

4.3.3.1. Authorisation

AIFMD has been updated to require additional granularity in terms of an AIFM, its resources and the persons conducting business on its behalf. Therefore, as part of the application for authorisation, more detail must be provided in relation to (1) the role, title and level of seniority of each person conducting the AIFM's business, (2) reporting lines and responsibilities of such persons inside and outside the AIFM, (3) an overview of the time that each person devotes to each aspect of their responsibilities, and (4) a description of both human and technical support required by the AIFM to comply with the requirements of AIFMD, (5) a description of both human and technical support required by the AIFM to supervise its delegates, (6) a description of the delegated portfolio management and delegated risk management and whether such delegation is partial of full, and (7) identification information relating to directors of the AIFM and its delegates.[752] This information is relevant to reporting, but more as static data that does not often change.

4.3.3.2. Conflicts of Interest

If AIFMs and UCITS management companies provide services to third parties, any potential conflicts of interest that arise must be appropriately managed. If the AIFM manages an AIF at the initiative of a third party, then the AIFM must inform the regulator of the steps that it has

[752] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 8 and 47. AIFMD art. 7 as amended by AIFMD II art. 1(3)(a).

taken to prevent conflicts of interest arising from the relationship with the third party. The AIFM must also provide the regulator with information about how it will identify, manage, monitor and disclose such conflicts of interest. The purpose of this requirement is to ensure the safeguarding and protection of AIF and investor interests.[753]

4.3.3.3. Delegation

As mentioned above in the authorisation section, more details need to be provided about the delegates to the AIFM. Such information includes the legal name, jurisdiction of establishment and the main regulator of the delegate or sub-delegate.[754] The list of delegated activities that must be notified to the regulator includes those listed in Annex I of AIFMD, plus MiFID services that an AIFM may provide under a top-up permission. Furthermore, the AIFM must demonstrate that the delegate proposed is capable and qualified to perform the delegated function. It is up to the AIFM to ensure that the delegate, wherever domiciled and whoever it is regulated by, performs the delegated function in compliance with AIFMD requirements.[755] By 16 April 2029, it is required of ESMA that it provide a report on the delegation practices and compliance within the market.[756]

4.3.3.4. Depositaries

[753] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 6. AIFMD art. 6 as amended by AIFMD II art. 1(2)(a).
[754] AIFMD art. 7 as amended by AIFMD II art. 1(3)(a).
[755] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 12. AIFMD art. 20 as amended by AIFMD II art. 1(9)(a)-(b).
[756] AIFMD art. 7 as amended by AIFMD II art. 1(3)(d).

Article 21 of AIFMD requires that a depositary to an AIF must be domiciled in the jurisdiction of the AIF. However, Article 1(10)(a) of AIFMD II loosens this requirement without creating a depositary passport. It allows depositaries in other Member States to provide the depositary service to an AIF. However, certain conditions must be met. Such conditions include demonstrating the lack of depositary services in the home Member State of the AIF to meet the needs of the AIF. However, such an application to the home Member State regulator will be dealt with on a case-by-case basis. Therefore, such depositaries will need to cooperate with their own regulator in addition to those to whom the AIF are providing services.[757]

Also, if a non-EU AIF wishes to appoint a third-country depositary, then a new requirement must be adhered to, which provides that the third country must not be a high-risk country. Therefore, it must not feature on the AML Financial Action Task Force (FATF) Anti-Money Laundering (AML) list. Also, the third country in question must not be on the EU's list of non-cooperating jurisdictions from a tax perspective. If the third country is not on such prohibited lists at the point of authorisation of the AIF but is subsequently added to it, then a new depositary must be appointed within an appropriate period of time, but not exceeding two years.[758]

4.3.3.5. Disclosure to investors

[757] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 40-42. AIFMD art. 21 as amended by AIFMD II art. 1(10)(a)-(b).
[758] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 45. AIFMD art. 21 as inserted by AIFMD II art. 1(10)(b)(ii).

The Article 23 disclosures to investors under AIFMD are expanded to include pre-investment and periodic disclosure of the name of the AIF, fees, charges and expenses covered by the EU AIFM in connection with the operation of the AIF that are directly or indirectly allocated to the AIF, and information on the possibility and conditions for using liquidity management tools.[759] Existing redemption rights in normal and exceptional circumstances must also be clarified. The introduction of these additional requirements on pre-investment and periodic disclosure is illustrative of AIFMD II's efforts to bolster market transparency and erode systemic risk.

4.3.3.6. Liquidity Management

Article 16 of AIFMD on the use of liquidity management tools has been extended to open-ended AIFs. Such funds must select the use of two liquidity management tools from Annex IIA. This selection can include the use of (1) suspension of subscriptions, repurchases and redemptions, (2) redemption gates, (3) extension of notice periods, (4) redemption fees, (5) swing pricing, (6) dual pricing, (7) anti-dilution levy, (8) redemptions in kind, and (9) side pockets.[760] However, certain liquidity management tools can only be used in certain scenarios. For example, a redemption in kind can not be used for retail investors. Hence, it is a tool that can only be activated in response to professional investor redemption requests.[761] The AIFM – and where this rule is also applied to UCITS – must have policies and

[759] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 43. AIFMD art. 23(1) as amended by AIFMD II art. 1(11)(a).
[760] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 30, 53. AIFMD art. 16 as inserted by AIFMD II art. 1(8). Also, see Annex IIA.
[761] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 31.

procedures in place detailing the activation or deactivation of any liquidity management tool on the list.[762]

4.3.3.7. Loan Origination

AIFMD II introduces a regime applied to AIFs that mainly follows a strategy of loan origination or whose originated loans have a notional value that represents at least 50% of its net asset value.[763] This represents a new financing source for small and medium-sized businesses within the economy. Loan origination covers instances where the AIF is directly granting a loan to a borrower or indirectly through a special purpose vehicle.[764] However, concentration limits of 20% of the notional value of the loans to a single borrower is applied.[765] Furthermore, it is prohibited for an AIF to engage in loan origination merely to transfer the loans or exposure to a third party.[766] This new regime only applies to AIFs that engage in loan origination after the date of entry into force of AIFMD II.[767] Such loan origination exposures will need to form part of the exposures reported on.

4.3.3.8. Marketing requirements of Non-EU AIFMs

[762] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 30, 53. AIFMD art. 16 as inserted by AIFMD II art. 1(8)(2d). AIFMD art. 46(2) as replaced by AIFMD II art. 1(20). AIFMD art. 47 as amended by AIFMD II art. 1(21)(c).
[763] AIFMD art. 4(1) as amended by AIFMD II art. 1(1)(b)(at).
[764] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 13-16. AIFMD art. 15(3) as amended by AIFMD II art. 1(7)(a).
[765] AIFMD art. 15(4) as amended by AIFMD II art. 1(7)(b).
[766] AIFMD art 15(4) as amended by AIFMD II art. 1(7)(b).
[767] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 23.

Similar to the new rules applied to depositaries, a non-EU AIF or non-EU AIFM should not be located in a high-risk third country under FATF rules or a third country that does not adhere to the OECD Model Tax Convention.[768] AIFMD provides that non-EU AIFMs are subject to Article 22 – 24 requirements on annual reports, disclosure to investors and reporting obligations respectively. Therefore, the AIFMD II changes to Articles 23 and 24 now apply to non-EU AIFMs.

4.4. Conclusion

This chapter focused on hedge fund reporting requirements connected to systemic risk. Hedge fund reporting requirements connected to systemic risk have been the central focus of this chapter. AIFMD's Annex IV template has been in use for a decade and is now in the process of being updated. Approved AIFMD II improvements are narrowing the gap in reaching a position whereby systemic risk can be effectively identified and combatted. However, significant issues exist concerning whether it is being submitted in the right frequency, timeframe and format. What is most noticeable about AIFMD II is what it did not provide for. It provides for changes to format, frequency and timing but does not specify or prescribe what a newly formed reporting regime may look like.

In Part 4.2, it was demonstrated that Annex IV provides data capable of informing systemic risk, particularly through key metrics such as leverage and liquidity. However, the current regime primarily identifies and combats systemic risk *ex post facto*, and much of the data

[768] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 45. AIFMD art. 21(6) as amended by AIFMD II art. 1(10)(b). AIFMD art. 35(2) as replaced by AIFMD II art. 1(14). AIFMD art. 36(1) as amended by AIFMD II art. 1(15). AIFMD art. 37(7) as amended by AIFMD II art. 1(16). AIFMD art. 40(2) as replaced by AIFMD II art. 1(17). AIFMD art. 42(1) as replaced by AIFMD II art. 1(18).

captured is static rather than actionable. As consistently argued throughout this thesis, any identification or combatting of systemic risk must surely operate in real-time, or it will only be addressed *ex post facto*. The identification of systemic risk is only valuable if the regulator can intervene in the market to neutralise the risk. Hence, this intervention must also be in real-time.[769] In Part 4.3, AIFMD II was considered, including the powers granted to ESMA to amend reporting frequency, timing, and format through RTS and ITS. These amendments address the accuracy and completeness of datasets required to inform systemic risk decision-making. However, these amendments arguably leave several questions unanswered, namely: (a) can systemic risk be identified in the absence of real-time reporting? (b) is Annex IV capable of becoming real-time, or should reporting be replaced by a real-time feed? (c) does the supervisory capability exist to identify actionable intelligence from submitted data sets in real-time? (d) if a supervisor could extract actionable intelligence in real-time, what options exist to intervene in the market in real-time to combat the systemic risk identified? Further, there needs to be a higher level of harmonisation between the regulation of the AIF and UCITS sectors. The asset management industry is the level at which reporting should be aligned for regulatory reporting synergies to be valuable in the identification and combatting of systemic risk. These questions may be answered by the powers granted to ESMA, as part of Level 2 measures, to make changes in frequency and timing through RTS and changes in format through ITS. The options which are available to ESMA will be addressed in Chapter 5 of this thesis, along with a proposal on how these changes would then support intervention in the market.

[769] The analogy with equity markets can be seen in the live reporting of share prices on the stock exchange with an associated circuit breaker for when the share price falls, in order to prevent destabilisation of the individual stock and market.

Chapter 5 A PROPOSAL TO STRENGTHEN AIFMD II'S MANDATORY DISCLOSURE REGIME

5.1. Introduction

This thesis has thus far focused on distinguishing the hedge fund sector from other sectors within the asset management industry and financial services, examined the hedge fund sector's distinctive characteristics such as the relationship of leverage to systemic risk, assessed the use of mandatory disclosure regimes in identifying and combatting this risk, and identified and critiqued AIFMD's updated mandatory disclosure regime, including its ability to deliver systemic risk identification and combatting outcomes for the hedge fund industry. The purpose of this final chapter is to make two proposals regarding how AIFMD's mandatory disclosure regime should be developed. The effect of these proposals would be to enhance and further strengthen AIFMD's ability to achieve its aim of identifying and combatting systemic risk.

As discussed in Chapter 4, AIFMD II[770] directs ESMA to draft Regulatory Technical Standards (RTS) to address the frequency and timing of the reporting process by 2027.[771] It also empowers ESMA with associated responsibility for making amendments to the reporting format through an Implementing Technical Standard (ITS).[772] These two Level 2 measures

[770] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj.
[771] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 27, 59 and Article 1(12)(d).
[772] RTS provides the details of the required change and the ITS provides for how those changes will be implemented.

are the mechanisms by which the changes introduced at Level 1 will be given effect. ESMA's Level 2 mandate has been extended to permit similar changes to the UCITS reporting regime.[773] However, AIFMD II has omitted any clear instruction concerning frequency, timing or format changes and given the full responsibility of introducing changes of this nature to ESMA as part of the Level 2 mandate.

The lack of clarity around frequency, timing and format, coupled with these issues being left to the discretion of EMSA, means that there is also uncertainty concerning how making changes in one regime relates to other sub-sectors of the investment industry. It is important to recognise that systemic risk is not just a hedge fund issue. Hedge funds sit alongside UCITS funds as the two major sectors of the asset management industry. ESMA has implicitly acknowledged that the identification and combatting of systemic risk is an asset management issue.[774] Hence, the alignment of the AIFMD and UCITS regulatory regimes is essential to the identification and combatting of systemic risk, since this is an issue which affects asset management broadly, rather than pertaining only to hedge funds or UCITS. Hence, this chapter will need to address the alignment strategy being undertaken by ESMA, as a prelude and context to making the two proposals of this chapter.

As is clear from the wording, ESMA's power to develop RTS is framed in minimal terms. It is limited to specifying details and standardising information, including reporting frequency and timing.[775] There is no express provision to enable real-time or live feeds.

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[773] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 2(7).

[774] While AIFMD II does not explicitly state that asset management causes systemic risk, it introduces mirrored amendments in the UCITS and AIFMD frameworks in ways that implicitly recognise that asset management activities can contribute to systemic risk. In particular, the AIFMD II strengthens liquidity risk management, supervisory reporting, and related oversight measures, reflecting concerns about potential systemic effects. These are issues that ESMA's mandate and prior work similarly address.

[775] AIFMD art 24(5a) as inserted by AIFMD II art. 12(d).

The detailed rules of the Level 1 AIFMD framework directive are found in the Level 2 AIFMR regulation, as structured by the Lamfalussy Process. AIFMR regards frequency and timing of reporting as being prime considerations for regulators. [776]

In achieving its aims, this chapter is broken into four parts. Part 5.2 will outline the arguments of the chapter. Part 5.3 will set the context of regulatory alignment, which has been a guiding principle of ESMA in relation to AIFMD II. Part 5.4 will put forward a proposal on potential changes that could be introduced by ESMA concerning the identification of systemic risk. Part 5.5 will put forward a proposal on potential changes that could be introduced by ESMA concerning the combatting of systemic risk.

5.2. Outline of Argument

This part will summarise the central arguments of the chapter. These arguments are advanced through two key proposals for reform. Further, it will show how these proposals respond to the issues identified in the preceding chapters of the thesis and how the proposals contribute to strengthening the chapter's overall argument.

This chapter argues that there needs to be a shift towards real-time regulatory reporting in the interests of rigorously identifying systemic risk. Real-time reporting would signify a more potent alternative to the existing quarterly or semi-annual approach to reporting frequency and timing based on fund size.[777] A practical standard rather than a legislative definition of

[776] See 4.2.2.2. Article 110(4) of AIFMR currently provides that 'the competent authority of the home Member State of the AIFM may deem it appropriate and necessary for the exercise of its function to require all or part of the information to be reported on a more frequent basis'. Therefore, by way of derogation, there is already a mechanism to allow competent authorities to change the frequency and timing of Annex IV reporting. Hence, the AIFMD regime refrains from obliging or recommending national competent authorities to implement real-time reporting but at the same time provides a mechanism whereby it can be achieved.
[777] See 4.2.4.

real-time reporting can be found in MiFIR's RTS on post-trade transparency. It defines 'real-time' as reporting within one minute of transaction execution.[778] Real-time reporting could be characterised by a format of live feed reporting.

ESMA is empowered to create a harmonised approach by implementing changes through RTS,[779] but there should be clear avenues by which a move to real-time reporting can be mandated. The argument of increasing reporting frequency may appear to be a reasonable solution in light of modern technological developments. However, real-time reporting in the conventional 'push'-based format, which involves data being submitted by regulatees, would create too much data. Therefore, an additional element of this argument is for the format of reporting to be amended from the existing push-based format to a real-time 'pull'-based live feed format, which involves data being extracted by regulators.

The primary purpose of this chapter is to argue that a Level 2 RTS should be used to amend the existing frequency and timing of regulatory reporting to real-time and that a Level 2 ITS should then implement this real-time reporting requirement through a new pull-based live feed reporting format. This would decisively aid regulators in identifying systemic risk. Real-time reporting needs to be introduced in order to support the identification of systemic risk triggers. The development of RegTech capabilities can now help to enable this frequency of reporting. Through real-time data reporting, there is a more realistic possibility that

[778] Regulation (EU) 2017/587 of 14 July 2016 supplementing Regulation (EU) No 600/2014 of the European Parliament and of the Council on markets in financial instruments with regard to regulatory technical standards on transparency requirements for trading venues and investment firms in respect of shares, depositary receipts, exchange-traded funds, certificates and other similar financial instruments and on transaction execution obligations in respect of certain shares on a trading venue or by a systematic internaliser, [2017] OJ L87/387, Article 14(1)(a). Also, ESMA, MiFID II/MiFIR Review Report on the transparency regime for equity and equity-like instruments, the double volume cap mechanism and the trading obligations for shares, para 184; available at: https://www.esma.europa.eu/sites/default/files/library/esma70-156-2682_mifidii_mifir_report_on_transparency_equity_dvc_tos.pdf (date accessed: 10 January 2026). Paragraph 184 states that 'Article 14 of RTS 1 defines "as close to real-time as technically possible" to be one minute after the relevant transaction at a maximum.'

[779] See 4.3.2.2.

systemic risk can be identified before risks crystallise. Further, through a live feed reporting mechanism rather than a millisecond-by-millisecond reporting format, the regulator will have the capability and power to extract targeted actionable intelligence from an online portal or exchange, which covers all industry participants.[780] This will allow for identifiable and developing systemic risk to be combatted.

As a natural corollary, this chapter argues that after real-time identification of systemic risk, there must be a mechanism to facilitate real-time intervention in the market to combat the destabilising effects of systemic risk. EU financial markets are currently using circuit breaker regimes as a way of combatting systemic risk.[781] However, the trigger mechanisms for existing circuit breakers are in need of refinement. Hence, the proposal of this chapter is for (i) national regulators and ESMA to use the data provided by an enhanced real-time reporting regime to contribute to a greater yield of actionable intelligence, and (ii) this actionable intelligence could be directed towards implementing the necessary changes to extant reporting methods.

5.2.1. Structure of proposals

The proposals of this chapter will be set within a context of strategic alignment. Part 5.3 of this chapter will therefore focus firstly on the cross-sectoral alignment that has happened between the AIFMD and UCITS regimes and secondly on what further alignment is needed. This will facilitate a more unified approach to identifying and combatting systemic risk,

[780] For an example of such a proposed portal or exchange, see Financial Stability Board, 'Format for Incident Reporting Exchange (FIRE): A possible way forward' 13 April 2023; available at: https://www.fsb.org/wp-content/uploads/P130423-2.pdf (date accessed: 10 January 2026).
[781] The MiFID II regime provides for both market-wide and single stock circuit breakers. 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, [2014] OJ L173/349, Article 48. Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012, [2014] OJ L174/84. Also, see 5.5.2.

particularly because systemic risk must be addressed at the asset management level broadly. Although systemic risk transpires across the financial services system, the concern relevant to this research is that risks are amplified and potentially transmitted by the interlinkages between the AIF and UCITS sectors. Currently, AIFMD II is seeking to align the mandatory disclosure regimes under the AIFMD and UCITS directives. Part 5.4 will focus on the issue of identifying systemic risk. Real-time reporting to the regulator is arguably the most appropriate frequency to support the identification of systemic risk. Current advancements in technology and innovation offer this possibility through RegTech.[782] However, there are many practical problems associated with real-time reporting, specifically the size and frequency of data to be transferred. Therefore, after explaining RegTech and its use in the reporting process, the recommendation of this part will be the use of RegTech to deliver a live data feed to the regulator that pulls data on demand rather than constantly submitting new reports in real-time under a push-based data architecture. Part 5.5 will focus on the specific methodology for practically combatting systemic risk. Many different methods and models exist for combatting systemic risk.[783] These models range from assessing capital adequacy at banks and the volatility of indices to the potential requirement for government bailout assistance. These models can be classified in terms of their potential for early warning, their connection to credit and liquidity, and their impact from a contagion and network perspective,

[782] F. Teichmann, S. Boticiu and B. Serg, 'RegTech – Potential Benefits and Challenges for Businesses' (2023) 72 *Technology in Society* 1. J. McCarthy, 'The Regulation of RegTech and SupTech in Finance: Ensuring Consistency in Principle and in Practice' (2023) 31(2) *Journal of Financial Regulation and Compliance* 186. A. Papantoniou, 'Regtech: Steering the Regulatory Spaceship in the Right Direction?' (2022) 6 *Journal of Banking and Financial Technology* 1. T. Adrian, 'AI and Regtech' IMF Virtual Workshop on AI & Finance 29 October 2021, available at: https://www.imf.org/en/News/Articles/2021/10/29/sp102921-ai-and-regtech (date accessed: 10 January 2026). I. Daldaban, 'RegTech and SupTech for Robo-Advisers: Alternative Regulatory Methods for Enhancing Compliance' (2019) 19 *Asper Rev Int'l Bus & Trade L* 59. ESMA, 'RegTech and SupTech – change for markets and authorities' (2019) 1 ESMA Report on Trends, Risks and Vulnerabilities 42, 44.
[783] S. Ellis, S. Sharma and J. Brezeszczyski 'Systemic Risk Measures and Regulatory Challenges' (2022) 61 *Journal of Financial Stability* 1.

according to Ellis *et al*.[784] However, underlying all of this is the challenge of obtaining and interpreting data.[785]

5.2.2. Clarification of scope

This thesis has not sought to lay a foundation for a reappraisal of which data sets are to be submitted for reporting requirements. Nor has the thesis sought to lay a foundation for the creation of new asset management circuit breaker regimes. The preceding chapters highlight the weaknesses of AIFMD's mandatory disclosure regime arising from reporting frequency and timing, as well as emphasising the associated ramifications in facilitating the identification or combatting of systemic risk by regulators. This thesis has therefore sought to highlight the incongruity between AIFMD's aim of combatting systemic risk and its frequency and timing of reporting. Incorporated within the proposals of this chapter is the idea that these changes can be sufficiently integrated within 'foundational' Level 2 reforms rather than waiting for the next scheduled review of the AIFMD regime.

From the perspective of introducing significant reporting changes, the asset management industry is experiencing an opportune time for change. The current change under AIFMD II is leveraging an existing reporting regime that is well embedded in the hedge fund industry, there are RegTech and SupTech solutions that can assist in real-time reporting, and there are already mature circuit breaker regimes in financial markets. Real-time reporting could lean on existing infrastructure for identification and combatting of systemic risk. It could also lean

[784] *Ibid*. Also, see page 32 for a commentary on regulatory challenges. The most significant regulatory challenges associated with systemic risk identification, measurement and combatting relate to the following: systemic risk is a global issue, there is a lack of harmonised macro-regulatory approaches by regulators, the 'one-size-fits-all' historic approach to issues like liquidity and capital is not appropriate, interconnectedness is not well understood and methods of stress testing need to be improved.
[785] *Ibid*., 29.

on the ongoing strategic alignment of AIFMD and UCITS regimes. The AIFMD and UCITS alignment must accordingly be addressed in this chapter to give context to the chapter's proposals.

5.3. AIFMD and UCITS alignment

The alignment of the AIFMD and UCITS regimes through simultaneously updating both regimes with the same wording is a purposeful and ongoing effort by the European Commission to ensure higher levels of uniformity in reporting at the asset management sector level. AIFs and UCITS funds are in some ways opposites of each other in that AIFs are defined by AIFMD as collective investment schemes that are not authorised under the UCITS Directive.[786] This key difference notwithstanding, the two fund regimes must be aligned to deliver a complete view concerning the identification and combatting of systemic risk in asset management. The efficacy of modern reporting is weakened by the current misalignment of definitions, calculations and methodologies.

Throughout this research, there has been a clear focus on the systemic risk which originates in the practices of AIFs, of which hedge funds are a dominant part. However, the asset management industry is largely made up of the AIF sector and the UCITS sector. As systemic risk is applicable to the asset management industry generally and not just hedge funds, a uniform view on matters such as reporting should have significant advantages in more appropriately identifying and combatting systemic risk. AIFMD II builds on the potential to align these sectors and includes updates to both AIFMD and the 2009 UCITS Consolidated

[786] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 4(1)(a)(ii). Also, see 4.3.

Directive.[787] It also provides for the achievement of reporting synergies whereby AIFMD reporting dovetails with reporting provisions of other EU directives, such as transaction reporting under MiFID.[788] Further, AIFMD II stipulates that information gathering and sharing between the AIFMD and UCITS reporting regimes must be improved, standardised and harmonised.[789]

In explaining the alignment context within which the proposals of this chapter will be made, Part 5.3 will be divided into two sections. Firstly, it will reiterate the need for cross-sectoral alignment. Systemic risk is a financial services market risk where the UCITS and AIF sectors are so intertwined from a product and counterparty perspective. However, there is little alignment in the current mandatory disclosure regime under the UCITS and AIFMD regimes. There is also little alignment on the definition, calculation and regulatory treatment of debt products, such as leverage, that drive systemic risk. Therefore, AIFMD II provides the legislative basis for what the European Commission has delegated to ESMA. Secondly, the alignment of the AIFMD and UCITS reporting regimes introduced through AIFMD II will be discussed. This part will also highlight the continuing need to align differences between the AIFMD and UCITS regimes from definitional, measurement and reporting perspectives.

[787] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj. Article 1 proposes changes to the AIFMD regime. Article 2 proposes changes to the UCITS regime.

[788] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 20b mandates ESMA to produce a feasibility report on possible supervisory reporting efficiencies, for example between AIFMD and UCITS. 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, [2014] OJ L173/349. Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012, [2014] OJ L174/84.

[789] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recitals 24 and 57. Also, AIFMD art. 5b(c) inserted by AIFMD II art. 1(12)(d). UCITS III art. 20a(6)(c) as inserted by AIFMD II Article 2(7).

Potential areas for ESMA to create enhanced alignment in their draft RTS and ITS will be highlighted.[790]

The alignment initiative of AIFMD II is focused on issues such as the general reporting obligation of the AIFMD and UCITS regimes, the delegation undertaken by management companies, and ESG obligations.[791] However, these alignments are at a high level and from a reporting format perspective. There is not yet any alignment on technical specifics. ESMA needs to build on its existing alignment initiative under AIFMD II to implement specific regulatory alignment between the UCITS and AIFMD regimes. This alignment should apply in particular to the treatment of leverage. It should also extend to other areas where the two regimes diverge, provided those areas are closely linked to systemic risk and are already captured in the regulatory reporting templates.

As the AIFMD and UCITS regimes are still divergent on specific issues such as definitions and calculation methodology, ESMA needs to ensure alignment at the technical as well as at the format level of reporting. To accomplish this, the first section will address systemic risk as a concern at the asset management sector level. The second section will further address the differing treatment of leverage between UCITS and AIFs. The purpose is to highlight the extent to which the hedge fund and UCITS sectors need to align on key systemic risk issues, such as the definition, measurement, and reporting of leverage data, in order to properly identify and combat systemic risk in the future as part of an updated reporting and circuit-breaker regime.[792]

[790] AIFMD art. 5a as inserted by AIFMD II art. 1(12)(d). UCITS III art. 20a(5) as inserted by AIFMD II art. 2(7).
[791] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recitals 38, 45, 48 and 51.
[792] There are additional levels of alignment that are necessary at a more foundational level to support aligned reporting. Such examples include alignment of the definitions, calculations, methodologies and regulatory

5.3.1. Systemic risk as an asset management issue

Although this research is focused on the hedge fund industry, systemic risk is a market-wide concern, both cross-sectorally and cross-jurisdictionally. The interdependence and interconnectedness of markets and industries mean that systemic risk is more suitably viewed as an EU funds industry challenge. The UCITS and AIF sectors are the two spheres of the EU asset management industry and are connected in several ways. They transact in common markets, trade in similar product types, and often have similar exposures and levels of leverage. [793] Systemic risk identification and combatting is an international issue, requiring data collection and intervention on a cross-sectoral and cross-border basis.[794] Hence, systemic risk in the hedge fund industry is part of a wider issue of systemic risk in asset management.[795]

To demonstrate a visible commercial connection between these spheres, one fund management company is often the manager of both UCITS and AIF fund ranges.[796] When a

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treatment of leverage. That level of alignment has not been included in the AIFMD II update and it has not been specifically outlined in the Level 1 text as required to be included in the Level 2 RTS or ITS. However, ESMA has been empowered to use the Level 2 RTS and ITS to reduce areas of inconsistency in asset management reporting frameworks and to improve the standardisation of the data reported. See AIFMD II, Article 2(7) which inserts a new Article 20b(1)(a)-(b). Although this second part is not a proposal, it sets the context within which reporting regime changes are taking place across the EU asset management sector. It sets the scene for the two proposals of this chapter.

[793] ESMA, ESMA's response to the EC consultation on the review of the EU macro-prudential policy framework for NBFI, 22 November 2024; available at: https://www.esma.europa.eu/sites/default/files/2024-11/ESMA50-43599798-9960_ESMA_response_to_the_Macroprudential_review_consultation.pdf (date accessed: 15 January 2025). Compare with ESMA, TRV Risk Monitor ESMA Report on Trends, Risks and Vulnerabilities, 29 August 2024; available at: https://www.esma.europa.eu/sites/default/files/2024-08/ESMA50-524821-3444_TRV_2_2024.pdf (date accessed: 10 January 2026). Maximum synthetic leverage of a UCITS fund is 100% of NAV. Average AIF leverage is approximately 120-130%.

[794] ESRB, 'The ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector' June 2015, p. 7; available at: https://www.esrb.europa.eu/pub/pdf/other/150625_esrb_handbook_addendum.en.pdf (date accessed: 10 January 2026).

[795] K. Morbee, 'Liquidity management tools in open-ended investment funds: the right tools in the right hands?' (2023) 18(2) *Capital Markets Law Journal* 233. Also, see 2.3.

[796] For example, the investment fund industry body in Luxembourg released statistics in 2024 to confirm that 65% of all ManCos in Luxembourg are Super ManCos. 27% are AIFMs. 8% are UCITS ManCos. See ALFI,

management company of a UCITS is also a fund management company of AIF funds, it is referred to in industry circles as a Super ManCo.[797] There is no regulatory designated status or licence for a Super ManCo. It merely refers to a Management Company that has both the AIFM licence and UCITS ManCo licence. Over the past decade, there has been an increasing trend of management companies in both industries becoming Super ManCos.[798] This trend is reflective of how the asset management industry views these two forms of funds as being part of one industry.[799]

As the EU's flagship fund offering, the UCITS regime has been resilient to systemic risk and significant failure.[800] It is a retail product that has investor protection at its core. Therefore, it is subject to very strict risk management rules.[801] Although the UCITS and AIFMD regimes have been updated over the years, they have not been fully aligned.[802] UCITS IV did align risk management rules to the AIFMD regime.[803] However, UCITS reporting is still much less extensive than the Annex IV AIFMD mandatory disclosure regime.[804]

Another difference between the two sectors is that leverage is defined and measured under different methodologies in UCITS and AIFMD funds.[805] There is still a need for alignment

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Observatory for Management Companies 2024 Barometer, 17 September 2024; available at: https://www.alfi.lu/getattachment/c172f318-9ef7-4440-800f-daba1ea3246a/2024-09-17-digital-booklet_alfi-pwc-manco_2024.pdf (date accessed: 10 January 2026).

[797] Roger Woolman, 'EU Super ManCos' time has come… but operational complexity poses barrier to success' HedgeWeek 29 January 2019; available at: https://www.hedgeweek.com/eu-super-mancos-time-has-come-operational-complexity-poses-barrier-success/ (date accessed: 10 January 2026).

[798] ALFI, s*upra* note 27.

[799] FT, 'Supermancos, the fund businesses winning big from Brexit' 24 February 2019; available at: https://www.ft.com/content/e4f4aad2-77bb-31f6-ae66-03c2febd68b5 (date accessed: 10 January 2026).

[800] N. Moloney, 'EU Financial Market Regulation a Decade From the Financial-Crisis-Era Reforms: Crisis, Uncertainty, and Capacity' (2023) 42 *Yearbook of European Law* 18.

[801] *Ibid*., 7.

[802] Most recently by UCITS V and AIFMD II.

[803] Moloney, *supra* note 31.

[804] *Ibid*., 25.

[805] K. Navid, 'How Many Single Rulebooks? The EU's Patchwork Approach to Ensuring Regulatory Consistency in the Area of Investment Management' (2022) 23 *European Business Organization Law Review* 376.

between AIFMD and UCITS on definitions, measurement methodologies, and reporting requirements, since hedge fund systemic risk is interconnected with that of the UCITS industry. This alignment has started with AIFMD II, but it is far from completed. AIFMD II has taken the interconnectedness of the AIF and UCITS sectors into account by making changes to align and harmonise the AIFMD and UCITS reporting regimes. However, much more alignment is needed in order to promote a greater level of regulatory certainty across both regimes and to facilitate how they operate together to identify and combat systemic risk.

One of the key aspects of alignment and harmonisation is in relation to regulatory reporting. Arguably, identification and combatting of systemic risk is most effective with a standardised and harmonised approach to (1) definitions, measurement methodologies, and reporting formats, (2) information sharing between supervisors, and (3) intervention approaches. In the EU, this means a much greater alignment between AIFMD and UCITS. Globally, harmonisation should be reflected in greater alignment between the reporting regimes of various jurisdictions, including the Annex IV and Form PF frameworks, as outlined in Chapter 4.[806]

Regulation of hedge funds started in 2003 with the European Parliament's 'own initiative' Purvis Report.[807] The alignment between the hedge fund and UCITS regimes has been organically happening since then. In the Purvis Report, it was initially proposed that hedge funds be brought within the scope of the UCITS as part of a retailisation strategy for all EU funds. This involved adapting hedge fund structures, investment strategies, and risk

[806] A. McGarva, 'Keeping Up with the Joneses: A Model Systemic Risk Reporting Regime for the Canadian Hedge Fund Industry' (2015) 38(1) *Dalhousie Law Journal* 173. In proposing a model for the Canadian hedge fund industry, comparison with the regime in the EU and US is made.
[807] J. Purvis, 'Report on the future of Hedge Funds and Derivatives', (2003) Final Report A5-0476/2003; available at: https://www.europarl.europa.eu/doceo/document/A-5-2003-0476_EN.pdf?redirect (date accessed: 10 January 2026).

management practices to meet the strict diversification, liquidity, and transparency requirements of the UCITS regime. It also required ensuring that hedge funds would be suitable for retail investors, including implementing regulatory safeguards, standardised reporting, and investor protection measures. It was proposed 'that investment funds should be able to elect to be regulated under the UCITS or the SAIVs regime and be bound by that regime's requirements.'[808]

The Purvis Report was followed by the EC Expert Group on Hedge Funds Report[809] and the post-crisis de Larosière Report.[810] Each concluded with different recommendations, but the broad consensus was that hedge funds needed to be regulated. A common suggestion in all of these reports was the inclusion of hedge funds in the UCITS regime. This did not ultimately materialise. However, as format elements of the AIFMD and UCITS regimes are now being aligned by AIFMD II, it opens the door to further content alignment between the regimes, notably in relation to regulatory reporting and the interpretation and calculation methodology for the numbers being reported.

5.3.2. The reporting alignment that AIFMD II creates between AIFs and UCITS

AIFMD II inserts a new Article 20a into the UCITS Directive, mirroring the provision inserted in AIFMD.[811] This amendment requires a UCITS management company to report to

[808] *Ibid*., p. 9, para 8.
[809] European Commission, 'Green Paper on the Enhancement of the EU Framework for Investment Funds' (2005) COM(2005) 314 final http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52005DC0314&from=EN (date accessed: 10 January 2026).
[810] J. de Larosière, Report of the High Level Group on Financial Supervision in the EU' (2009); available at: http://ec.europa.eu/economy_finance/publications/pages/publication14527_en.pdf (date accessed: 10 January 2026).
[811] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and

competent authorities all of the markets, instruments, and exposures of the UCITS it manages.[812] It must also report the market risk, liquidity risk, counterparty risk, operational risk, leverage employed by the AIF, and delegation arrangements concerning portfolio or risk management. The information concerning the delegation of portfolio or risk management must include delegate names, domicile, full-time staff needed to monitor delegates, human and technical resources to monitor the delegation, details of due diligence carried out as part of the delegation, commencement and expiry dates of the delegation and sub-delegation arrangements, and more granular details on functions sub-delegated.[813] This information may be requested on a periodic or ad hoc basis in the pursuit of effective monitoring of systemic risk.

ESMA is obliged to draft an RTS specifying the details of the information to be reported under this amended legislation and the frequency and timing of this reporting.[814] ESMA must also draft ITS detailing the format of the reported data to be reported, the method and arrangement for submission of reports, and the template used for reporting.[815] Further, ESMA may consult with the ERSB and, in the interests, *inter alia*, of systemic risk, ESMA may impose additional reporting requirements on all competent authorities.[816] Therefore, as part of

custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 2(7). Also, see 4.3.

[812] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 2(7).

[813] UCITS III art. 20a(2)(d)(i)-(viii) as inserted by AIFMD II art. 2(7).

[814] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 20a(5).

[815] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 20a(6).

[816] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 20a(3).

drafting its RTS and ITS for AIFMD II, ESMA could address all the leverage-related inconsistencies between the AIFMD and UCITS regimes, as well as any other reportable risk under the newly inserted Article 20a. [817]

By 16 April 2026, ESMA must provide a report to the European Commission detailing the development of supervisory data under both the AIFMD and UCITS regimes. The purpose of this report is to create more reporting alignment, reduce any duplication of data collection, reduce inconsistencies between the reporting regimes, and facilitate standardisation of reporting between both regimes in order to deliver a single asset management sector view.[818]

5.3.2.1. Potential areas of enhanced alignment in ESMA RTS and ITS

To strengthen the ability of current regulatory frameworks within the asset management sector to work together to help identify and combat systemic risk, it is necessary to align on issues such as definitions, measurement methodologies, and reporting. Alignment of the AIFMD and UCITS legal frameworks is specifically referred to in the AIFMD II Recitals and Articles 1 and 2, where similar wording is used for both regimes in relation to the reporting obligations of both regimes.[819] This alignment can be achieved by ESMA's development and submission of RTS to the European Commission, which may then adopt the RTS as delegated

[817] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, amended Article 20a(5) states '[w]hen developing the draft regulatory technical standards referred to in the first subparagraph, point (b), ESMA shall not introduce reporting obligations in addition to those set out in paragraph 2, point (d)'. This is also stated in relation to AIFMD in the amendment to Article 24(5a).'

[818] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Article 20b.

[819] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recitals 38, 45, 48, and 51.

acts.[820] Delegated acts are defined as non-legislative acts adopted by the European Commission.[821] Delegated acts serve to amend or supplement the non-essential elements of a piece of legislation. Implementation is by way of an RTS or an ITS.[822] The alignment promoted by AIFMD II includes provisions relating to delegation, ESG, remuneration, and third-country entities.[823] However, further alignment should be pursued.

AIFMD contains a definition for leverage which remains applicable under AIFMD II. AIFMD states that leverage is 'any method by which the AIFM increases the exposure of an AIF it manages, whether through the borrowing of cash or securities or leverage embedded in derivative positions or by any other means.'[824] Although there is no leverage cap imposed upon an AIF, each fund must set and disclose its self-imposed leverage cap.[825] Once set, an AIFM must measure its leverage using an approved calculation methodology. According to AIFMD, the two approved calculation methodologies are the 'gross' and 'commitment' methods.[826] The gross method requires calculating the exposure of leveraged positions whilst

[820] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 27 provides that ' … to ensure the consistent harmonisation of supervisory reporting obligations, power should be delegated to the Commission to adopt regulatory technical standards by means of delegated acts pursuant to Article 290 TFEU in accordance with Articles 10 to 14 of Regulation (EU) No 1095/2010 to set out the contents, forms and procedures to standardise the supervisory reporting process by AIFMs, thus replacing the reporting template laid down in the delegated act adopted pursuant to Article 24 of Directive 2011/61/EU, as well as the reporting frequency and timing. As regards information to be reported on delegation arrangements, the regulatory technical standards should remain limited to setting out the appropriate level of standardisation of the information to be reported. The regulatory technical standards should not add any elements that are not provided for in Directive 2011/61/EU.'

[821] Treaty on the Functioning of the European Union (TFEU), [2012] OJ C 326/47, Article 290.

[822] See 4.3.2.2.

[823] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj.

[824] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 4(1)(v).

[825] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 15(4).

[826] Regulation (EU) No 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, [2013] OJ L83/1, Recital 11 and Article 6-8.

deducting cash elements and including repo positions.[827] The commitment method requires the conversion of derivative positions into an equivalent underlying position, the netting of positions and associated hedging, and the inclusion of exposure such as repos and securities lending.[828] These methodologies must be subjected to strict stress testing procedures.[829] Once calculated, leverage must be reported under the mandatory disclosure regime on a 'substantial basis'.[830] As defined, the leverage is considered to be used on a substantial basis when 'the exposure of an AIF as calculated according to the commitment method under Article 8 of this Regulation exceeds three times its net asset value.'[831]

A UCITS fund is ordinarily not allowed to be leveraged. A UCITS fund is only allowed to borrow cash on a temporary basis up to a maximum of 10% of the value of the fund's assets in order to fund redemptions for two reasons: a temporary need for cash or the purchase of immovable property for the business.[832] However, if borrowing is undertaken for both of these reasons, then a combined limit of 15% is applied.[833] The purpose of this rule is to allow funds to smooth out any mismatch they may have in their cash flow. This ensures that the UCITS fund can meet short-term obligations without being forced to sell assets at an

[827] Regulation (EU) No 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, [2013] OJ L83/1, Article 7.
[828] Regulation (EU) No 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, [2013] OJ L83/1, Article 8.
[829] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 15(3)(b).
[830] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1, Article 24(4).
[831] Regulation (EU) No 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, [2013] OJ L83/1, Article 111(1).
[832] Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) [2009] OJ L302/32, Article 83(1)-(2).
[833] Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) [2009] OJ L302/32, Article 83(1)-(2).

inopportune time. It also allows the UCITS fund to make necessary investments without compromising liquidity. Overall, the rule balances operational flexibility with investor protection by limiting exposure to excessive borrowing.

The UCITS Directive does not, therefore, define what leverage is and only refers to leverage as part of exposure to borrowing and derivatives. This can frustrate assessments of how leverage is connected to systemic risk. As such, a UCITS fund must never have a global exposure that exceeds the value of its net assets.[834] This must be calculated on a daily basis and in conformity with the commitment method as provided for under UCITS IV.[835] Such global exposure must include repos and securities lending positions.[836] Netting and hedging must also be included in the exposure calculation methodology.[837]

However, there is no common definition of leverage or exposure across the AIFMD and UCITS regimes. There are differences in how borrowing or derivative exposure is calculated and in the inclusion of repos, securities lending, netting, and hedging. However, they refer to slightly different contexts of leverage versus global exposure. There is a shared methodology for commitment calculation. However, there is no alignment on reporting on a substantial basis. Arguably, under Article 20a, there is room for further alignment between the AIFMD and UCITS regimes that could be achieved by ESMA making changes to the AIFMD II RTS and ITS that ESMA is scheduled to draft by 2027.

[834] Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) [2009] OJ L302/32, Article 51(3).
[835] 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 L176/42, Article 41(2)-(3).
[836] 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 L176/42, Article 41(4).
[837] 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 L176/42, Article 42(2)-(5).

5.4. Identification of systemic risk

Part 5.3 highlighted that ESMA is actively pursuing a strategy of alignment between the AIFMD and UCITS regimes. Much of the updated wording contained in AIFMD II is being mirrored in the UCITS regime. This reinforces the argument that systemic risk is more suitably viewed as a broader asset management issue rather than just a hedge fund issue.

This part of the chapter will focus on making a proposal concerning the potential of implementing real-time reporting under the current updating of AIFMD. The proposals will be restricted to the mandate that ESMA possesses to draft RTS and ITS in relation to AIFMD II.

The identification aspect must be addressed because, before a systemic risk can be combatted, the risk must be identified. Therefore, financial stability and combatting systemic risk can significantly depend on the initial collection of information upon which to make this identification assessment. Hence, this part will argue that real-time reporting to the regulator is an appropriate format to support the timely identification of systemic risk. However, this task is not without its challenges and practical problems. In real-time reporting, the size and frequency of data to be transferred would entail massive flows of changing data to be aggregated and analysed.[838] The solution to this problem could be through advancements in technology and innovation. Therefore, this part will argue in favour of the use of rapidly evolving RegTech solutions to deliver a live data feed to the regulator rather than constantly submitting new reports in real-time.

[838] Aggregation is the adding of all individually reported data relating to the same securities or exposures.

Hence, the recommendations of this part are twofold. Firstly, ESMA should include in its Level 2 RTS – due by 2027 – an amendment to the current frequency of the AIFMD reporting regime. This chapter argues that the amendment should move the frequency and timing of reporting to real-time. Secondly, the associated Level 2 ITS – which ESMA must draft to the same deadline – should include a change in format so that reporting is to be carried out through a live feed rather than through submission of data.

This part of the chapter will be broken into three sections. The first section will detail the real-time reporting frequency proposal. This section will argue that, without going to real-time reporting, it is practically impossible to have the necessary data in time to identify a nascent systemic risk before it crystallises. Secondly, the most significant problems associated with real-time reporting will be discussed, particularly problems of data size and storage. Thirdly, the use of RegTech developments to support a proposed reporting format change to live data feeds will be proposed.

5.4.1. Real-time reporting frequency proposal

Over a decade on from the initial implementation of AIFMD and in the aftermath of COVID-19, the threat of systemic risk within debt markets remains a crucial question in relation to the hedge fund industry.[839] Although systemic risk has constantly been monitored at sectoral and international levels, it remains outside the capability of regulators to identify systemic risk ahead of time.[840] Institutions can be categorised as systemically important based

[839] See 4.2. Also, Moloney, *supra* note 31.
[840] See 3.4.

on factors such as their size and interconnectedness, but the identification of developing systemic risk within the market remains elusive.[841]

Inherent in the argument of this chapter is that the time of reporting by AIFMs to regulators, and the analysis of that data by European supervisors, is at odds with AIFMD's objective of identifying and combatting systemic risk. AIFMD reporting is currently *ex-post facto* and therefore cannot be effectively used to identify or combat systemic risk until after the extent of systemic risk becomes manifest. Therefore, there is a conceptual and practical disconnect between what AIFMD seeks to do and what its mandatory disclosure regime toolkit is capable of delivering.[842]

Although AIFMD II gives ESMA the opportunity at Level 2 to propose updates to the frequency and timing of reporting and its format, it does not require this to be real-time or through a live data feed format.[843]

The typical focus of regulators within financial markets has been to make information accessible to investors in real-time.[844] However, the emphasis has generally not been on real-time reporting of information to regulators or the use of actionable information by regulators. The reporting and use of information by regulators should be real-time, because the risks presented by the financial markets need to be predicted and dampened in real-time.

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[841] Moloney, *supra* note 31, 4.
[842] H. Hofmann, D. Zetzsche, and F. Pflücke, 'The Changing Nature of 'Regulation by Information': Towards Real-Time Regulation?' (2022) 28 *European Law Journal* 172.
[843] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj, Recital 27 and Article 12 implementing a new Article 24(d)(c) to AIFMD provide for the drafting of Regulatory Technical Standards concerning frequency and timing of reporting. Recital 59 and Article 2(7) implementing a new Article 20a(5)(c) to UCITS III give ESMA the same responsibility to draft Regulatory Technical Standards as applied to reporting under the UCITS regime.
[844] M. So, A. Mak, and A Chu, 'Assessing Systemic Risk in Financial Markets Using Dynamic Topic Networks' (2022) 12(2688) *Scientific Reports* 1.

The purpose of collecting information must be to identify and combat systemic risk and not to merely analyse it *ex post facto* to confirm root causes of the crystallised risk.

Systemic risk is more than just fluctuations in uncertainty or shifts in investor behaviour. It also arises from the complex interconnections and latent vulnerabilities within the financial system.[845] Importantly, the availability of real-time data should not result in hasty or knee-jerk regulatory responses. Instead, it should equip regulators with the insights necessary to act appropriately and effectively to maintain market stability.

To support the argument of real-time regulatory reporting, this part will refer to the original academic work by Hood and others, which focused on mapping out the structure and relationships of a regulatory system and sub-systems.[846] It is necessary to consider theoretical perspectives on regulatory reporting in order to establish a rationale for the practical changes which will be recommended by the proposals of this chapter. The work of Hood and others included the implementation of standards, compliance by individuals, and sanctioning phases at all levels of the system and sub-system. Within the work of Hood and others, the schema is broken into three phases or sub-systems: directing, detecting and deterring. This schema is called the 'risk regulatory regime'.[847]

Hardy and others build on the work of Hood *et al* concerning risk regulatory regimes by further developing the phases of what they call the 'risk cycle'.[848] In this risk cycle, there are

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[845] *Ibid*., 9.
[846] C. Hood, H. Rothstein and R. Baldwin, *The Government of Risk: Understanding Risk Regulation Regimes* (Oxford University Press 2001). C. Hood, H. Rothstein, R. Baldwin, J. Rees and M. Spackman, 'Where Risk Society Meets the Regulatory State: Exploring Variations in Risk Regulation Regimes' (1999) 1(1) *Risk Management* 21.
[847] M. Power, 'The Financial Reporting System – What Is It?' (2021) 51(5) *Accounting and Business Research* 468.
[848] C. Hardy, S. Maguire, M. Power and H. Tsoukas, 'Organizing Risk: Organisation and Management Theory for the Risk Society' (2020) 14(2) *Academy of Management Annals* 1032.

three modes – prospective, in-real time and retrospective. These elements of the risk cycle are analogous to the transmission, accumulation and materialisation of systemic risk discussed in Chapter 2. Prospective regulation of risks is less certain because it involves assumptions about what might happen. Regulating retrospectively is also less effective because the risk has already materialised. Similarly, the identification and combatting of systemic risk is less certain at the transmission stage but less effective at the materialisation stage. It is the real-time nature of analysis and intervention that is the key to effective intervention.

Power builds upon the work of Hood and Hardy by applying their directing, detecting and deterring framework specifically to financial reporting.[849] Power proposes that, when financial reporting is turned into a risk cycle, the prospective, real-time and retrospective elements turn into a feedback loop. In this continuous feedback loop, prospective standard setting feeds real-time monitoring, which in turn feeds retrospective enforcement.[850] Although Power's framework relates to financial reporting, it can be applied to any regulatory reporting system, which is why it is instructive in the proposal of this part of the chapter.

In Power's framework, directing and detecting are done in real-time. However, the enforcement is done retrospectively. Therefore, there is a significant challenge in the link between the monitoring and enforcement sub-systems.[851] In a real-time scenario where systemic risk can crystallise and inflict severe damage in real-time, it seems less effective to have intervention and enforcement of rules completed after the damage has already been done.

[849] Power, *supra* note 78.
[850] *Ibid*., 469.
[851] *Ibid*., 470.

Another issue is that Power's framework is based on the concept of interconnectedness: the connection between the monitoring and enforcement sub-systems. However, institutional disconnectedness of those in charge of the monitoring and enforcement is asserted as being the main challenge. Whilst in theory it is possible to identify overlaps in function, actors with these overlapping functions may not be connected in ways for there to be seamless communication or for such communication to happen at a frequency anywhere near real-time in practice. Therefore, the first element of the proposal of this chapter is to recognise that, at the sub-system level within AIFMD's regulatory reporting regime, nothing is being completed in real-time. Systemic risk monitoring is not undertaken in real-time, and subsequent intervention to combat systemic risk is not undertaken in real-time. There is no real-time communication between those who do the monitoring and those who do the intervening and enforcing. Therefore, AIFMD II Level 2 represents the window of opportunity for foundational changes to the reporting regime.

A potential solution to the issue of identifying systemic risk, facilitated by recent technological developments, is a move to real-time reporting.[852] This must be mirrored with a move to real-time monitoring and market intervention by regulators. This has already been done in other areas, such as the derivatives market, where real-time reporting has been introduced through the European Market Infrastructure Regulation (EMIR).[853] As an example of arguments in favour of real-time reporting, Chavleishvili and Kremer, in an ECB working paper, have given their support to the idea that systemic risk needs to be monitored in real-time.[854] To populate the models and tools that they are using to identify systemic risk,

[852] Hofmann *et al*, *supra* note 73. Financial Stability Board, The Use of Supervisory and Regulatory Technology by Authorities and Regulated Institutions Market developments and financial stability implications, 9 October 2020; available at: https://www.fsb.org/wp-content/uploads/P091020.pdf (date accessed: 10 January 2026). D. Zetzsche, D. Arner, R. Buckley, and R. Weber, 'The Evolution and Future of Data-Driven Finance in the EU' 57 (2020) *Common Market Law Review* 331.
[853] Hofmann *et al*, *supra* note 73.
[854] S. Chavleishvili and M. Kremer, 'Measuring Systemic Financial Stress and its Risks for Growth' (2023) *ECB Working Paper Series* No 2842, 1.

Chavleishvili and Kremer acknowledge the requirement for daily updated data sets.[855] These daily data sets can be used to group variables or granular indicators in order to measure a single overall indicator.[856] The overall indicator in this scenario is systemic risk.

Hence, real-time monitoring is a potential key to unlocking the ability for regulators to identify systemic risk. As systemic risk occurs in real-time, the data sets needed to effectively identify systemic risk would equally need to be submitted in real-time. Further, they would need to be analysed and actioned in real-time. This will be further developed in the next part on combatting systemic risk.

5.4.2. Problems associated with real-time reporting

If there are grounds for integrating real-time reporting within the AIFMD II reforms, it should be acknowledged that there can be problems associated with real-time reporting, irrespective of the notable benefits. Real-time reporting could be decisive in the monitoring of systemic risk, but it is not without its practical difficulties. For instance, if data is made reportable in real-time, it can be very difficult to know what metric will serve as a valid indicator.

For many years, academics and practitioners have directed their efforts towards determining ways to predict systemic risk emanating from traded debt within the financial market. Academic and practitioner studies into the 2007 global financial crisis have focused on measuring the systemic risk related to capital shortfalls at global banks, the equity value reduction during the collapse, and the increase in credit risk during the crisis. However, the

[855] *Ibid*., 14.
[856] *Ibid*., 37. Y. Schüler, P. Hiebert and T. Peltonen, 'Financial Cycles: Characterisation and Real-Time Measurement' (2020) 100 *Journal of International Money and Finance* 82.

challenge has been how to predict on an *ex-ante* basis in order to intervene at a point in time to stop the crystallisation of harm.[857] *Ex-ante* means that the assessment of systemic risk is forecasted or predicted, rather than being based on concrete results. This prediction is a reflection of the fact that concrete results are never available in real-time. To fight systemic risk, there is a need to address the risk before it arrives and becomes a fact or concrete result. The 'time-inconsistency of regulatory actions' is arguably related to the issue of whether or not a systemic risk is identified and then combatted in real-time.[858]

Monitoring systemic risk *ex-post* the global financial crisis has been extremely difficult. Few reliable indicators of systemic risk have been identified. The challenge of designing indicators of systemic risk and how to monitor *ex-ante* is even more difficult.[859] This is because an indicator must operate based on future observations and predictions about the existence of systemic risk in the present. This is what is referred to as a 'two-sided filter'.[860] However, for a two-sided filter to operate effectively, its indicator must be computed in real-time.[861]

Most financial reporting operates on an Extract-Transform-Load (ETL) basis.[862] ETL means an extract is taken of a data set, it is transformed into a reportable format and then reported. This is the concept that information is first assembled in its raw state. The information then needs to be structured to enable raw data to be interpreted, to enable decision-making and to

[857] V. Acharya, L. Pedersen, T. Philippon and M. Richardson, 'Measuring Systemic Risk' (2017) 30(1) *The Review of Financial Studies* 3. G. Castellano, 'Don't Call It a Failure: Systemic Risk Governance for Complex Financial Systems' (2024) 3 *Law & Social Inquiry* 1. I. Anabtawi and S. Schwarcz, 'Regulating *Ex Post*: How Law Can Address the Inevitability of Financial Failure' (2013) 92 *Texas Law Review* 75. S. Schwarcz, 'Systemic Regulation of Systemic Risk' (2019) 1 *Wisconsin Law Review* 1.
[858] Acherya *et al*, *supra* note 88.
[859] B. Hartwig, C. Meinerding and Y. Schüler, 'Identifying Indicators of Systemic Risk' (2021) 132 *Journal of International Economics* 1.
[860] *Ibid*., 2.
[861] *Ibid*., 7.
[862] N. Fikri, M. Rida, N. Abghour, K. Moussaid and A. El Omr, 'An Adaptive and Real-Time Based Architecture for Financial Data Integration' (2019) 6(97) *Journal of Big Data* 1.

have an actionable quality to it in that the data could be utilised for market intervention. The data then needs to be formatted to be reportable in compliance with a regulator's template. ETL integrates different tools to move the data through different processes.[863] For example, once assembled in raw form, a business intelligence system like Power BI is often used to structure data. Integration software that operates in real-time is often used to further process and structure data sets. Finally, reporting software like SAP is commonly used to report data in the required format.[864]

The problem with ETL architecture is that it is designed to extract a snapshot and then process it through to the report phase.[865] The three-step ETL framework struggles when required to operate on a millisecond-by-millisecond frequency. The volume of big data created makes it difficult to reorganise, restructure, and reinterpret.[866] The nature of the ETL reporting model creates too much data. It is analogous to drinking water from a fire hydrant. Therefore, ESMA needs to consider a change in reporting format to a pull-based live stream or data feed from the market participant rather than a push-based ETL snapshot on a millisecond-by-millisecond basis.

ESMA appears to be looking into how to achieve this as part of its current data strategy.[867] Although there is no notable precedent for ESMA to operate a pull-based approach to

[863] *Ibid*., 2.
[864] SAP is an enterprise resource planning software system that allows for complex financial reporting. Power BI is a Microsoft tool used to interact with and visualize complex data sets.
[865] Fikri *et al*, *supra* note 93, 3-4.
[866] *Ibid*., 23-24. Also, see EBA, 'Big Data and Advanced Data Analytics' (EBA/Rep/2020/01), 11; available at: https://www.eba.europa.eu/sites/default/files/document_library/Final%20Report%20on%20Big%20Data%20and%20Advanced%20Analytics.pdf (date accessed: 10 January 2026). EBA states that 'Big Data refers to large volumes of different types of data, produced at high speed from many and varied sources (e.g. the internet of things, sensors, social media and financial market data collection), which are processed, often in real time, by IT tools (powerful processors, software and algorithms).'
[867] ESMA Data Strategy 2023-2028, 15 June 2023, p. 13: available at: https://www.esma.europa.eu/sites/default/files/2023-06/ESMA50-157-3404_ESMA_Data_Strategy_2023-2028.pdf (date accessed: 10 January 2026).

collecting data, ESMA has acknowledged that, in relation to the AIFMD and UCITS regulatory reporting regimes and their alignment, all pull and push approaches would be considered. One recent test case that ESMA is likely to be aware of is the development of AuRep – the Austrian Reporting Services GmbH, which is trialling a new approach to regulatory reporting in the Austrian banking market.[868]

The Austrian trial has surrounded the use of reporting cubes instead of templates, and this is still a push-based system. A data cube is a model of arranging data where large amounts of data are used, and memory needs to be maximised. Data cubes also facilitate more complex enquiries because the data is structured in a multi-dimensional manner. This model was used to test a reporting mechanism for over 1,800 reportable entities in Austria within the banking industry. The purpose of using data cubes is that the cubes can be supplemented with additional information from different sources. This transforms a basic cube into a 'smart cube'. This smart cube reporting model allows for a next-generation aggregation of multi-dimensional data sets, the structuring of voluminous and complex data sets, and the surveying of those data sets.[869] From the findings arising from this trial, there are two aspects that are relevant to this chapter's proposal: (1) cubes of information that allow individual firms to send a query to the cube to identify any changes that have been made, and (2) the issue of using live regulatory feeds.[870] Together, this raises the idea that the regulator could also execute a query and that live feeds provide for the most appropriate decisions to be made. Another example that ESMA will be aware of is the Swiss and Liechtenstein banking

[868] See Austrian Reporting Services project information at https://www.aurep.at (date accessed: 10 January 2026).
[869] See OeNB explanation of the reporting model at https://www.oenb.at/meldewesen/gemeinsames-meldewesen-datenmodell.html (date accessed: 10 January 2026).
[870] M. Piechocki and J. Lux, 'Reforming regulatory reporting: are we headed towards real-time?' Bearing Point Institute; available at: https://www.regnology.net/ecomaXL/files/bei_reforming-regulatory-reporting-are-we-headed-toward-real-time.pdf(date accessed: 10 January 2026).

system for regulatory reporting connected to digital regulatory reporting (DRR). This reporting solution is a 'pull-mechanism' between regulated firms and the supervisor.[871]

5.4.3. Interconnectedness as an indicator of systemic risk

In terms of indicators of systemic risk, interconnectedness has always been highlighted as the major concern.[872] Interconnectedness and the size of a systemic threat can be measured for an individual firm.[873] This is the basis upon which market participants are categorised as systemically important. This is more about the systemic risk due to trading volume, rather than due to balance sheet size. However, a more appropriate indicator might be to look at networks of connected firms. This would encompass looking at the networks from a trading volume perspective rather than a balance sheet size perspective. The argument for measuring networks is that there is a co-movement, or correlation of activity, that leads to systemic risk materialisation.[874] Hence, it is worth noting the significance of recording trading volumes for networks of connected firms.

Identifying systemic risk through indicators and data is very challenging. For regulatory purposes, the term 'systemic risk' has evaded a satisfactory definition. The ability to identify contagion in direct and indirect channels is equally challenging and difficult to ascertain.[875]

[871] The Financial Conduct Authority and Bank of England appointed PA Consulting in March 2023 to investigate the progress of global regulatory reporting initiatives and identify learnings from these initiatives that could be applied in the delivery of their joint Transforming Data Collection initiative. The following report produced by PA Consulting sets out the findings and analysis from the review of five global digital regulatory reporting initiatives – Digital Regulatory Reporting, available at: https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/transforming-data-collection/digital-regulatory-reporting-2023-update (date accessed: 10 January 2026).

[872] P. Borochin, and S. Rush, 'Information Networks in the Financial Sector and Systemic Risk' (2022) 134 *Journal of Banking and Finance* 1.

[873] R.L. Lumsdainea, D.N. Rockmoreb, N.J. Fotic, G. Leibonb, and J.D. Farmere, 'The Intrafirm Complexity of Systemically Important Financial Institutions' (2021) 52 *Journal of Financial Stability* 1.

[874] *Ibid*., 16.

[875] D. Bholat and J. Gray, 'Organizational Form as a Source of Systemic Risk' (2013) 7 *Economics* 3. The direct contagion channel is where market participants default on obligations to one another. The indirect contagion channel is systemic risk which passes outside contractual links between counterparties.

The result is that systemic risk models often focus on creating identification methods without explaining the source or measurement of systemic risk.[876] Furthermore, measuring the source and magnitude of systemic risk is elusive because systemic risk can crystallise because of a single large event or many interconnected smaller events that have a compounding effect.[877] The crystallisation events can only be combatted in real-time, and hence, real-time reporting is the only way to effectively identify and combat systemic risk. Requirements on minimum holdings, capital reserves or levels of additional capital cannot adequately be used to identify and combat systemic risk. These requirements can only alleviate the aftermath of a risk crystallisation by obliging a market participant to allocate funds to prevent a fatal blow being dealt by the crystallising event.

5.4.4. Technologically-enabled real-time reporting

The ability to move to real-time reporting can only be made possible through technology. In an accounting context, Trigo *et al* address the issue of the challenges in contemplating a move from periodic to real-time reporting.[878] Although a decade old, this analysis highlighted the fact that reporting of financial information was in the process of transitioning to real-time frequency.[879] The suitability or otherwise of real-time reporting was not the main barrier to this transition. Instead, it was the extent to which appropriate technological solutions could enable a move to such a frequency. The technological considerations outlined in a move from periodic to real-time reporting are significant. These considerations comprise (1) the

[876] *Ibid*.
[877] See 2.3.
[878] A. Trigo, F. Belfo and R. Estébanez, 'Accounting Information Systems: The Challenge of the Real-Time Reporting' (2014) 16 *Procedia Technology* 118.
[879] *Ibid*., 119.

existence of software that can report in real-time; (2) the amount of big data created when sets of data are processed on a millisecond-by-millisecond basis; (3) the complexity and completeness of data; and (4) continuous assessment of the data being submitted.[880] The very same issues exist today in relation to moving from periodic to real-time reporting under AIFMD's mandatory disclosure regime.

ESMA could consider the technological advances made in the current reporting infrastructure, the fact that EU regulators such as Austria's central bank, the Oesterreichische Nationalbank (OeNB), have for several years been investigating the potential live extraction of data from traditional reporting mechanisms, and the development of SupTech solutions in setting out its frequency, timing and format amendments.[881]

Regulators have limited resources that they can access compared to those of the financial services industry in terms of market understanding and technological assistance. Therefore, the cost of information collection has been shifted to industry firms.[882] Although this dilemma may never change, ESMA should consider alleviating the burden associated with the format of regulatory reporting. A live data feed, once installed, would not require AIFMs to spend the resources necessary to assemble, structure, reconcile and report data sets every quarter.

5.4.5. RegTech and amending the reporting format to live feeds

With the data surge within financial services over the past decade and the changing consumer behaviours facilitated by increased digitisation, technological solutions have developed,

[880] *Ibid*., 121-122.
[881] M. Piechocki and T. Dabringhausen, 'Reforming Regulatory Reporting: From Templates to Cubes' 2015 BIS Working Paper 6.
[882] H. Allen, 'A New Philosophy for Financial Stability Regulation' (2013) 45(1) *Loyola University Chicago Law Journal* 198.

known as FinTech.[883] RegTech is a sub-set of FinTech, and RegTech is essentially the technology used by regulatees for the purposes of satisfying regulatory compliance requirements, such as reporting obligations under a mandatory disclosure regime, such as Annex IV.[884] Although SupTech is also a sub-set of FinTech, SupTech is differentiated from RegTech by being the technology used by regulators for the performance of supervisory functions such as aggregating, structuring, interpreting and stress testing reported data to extract actionable intelligence.[885] Both technologies are also a recognised part of the technological solution to identifying and combatting systemic risk.[886]

As has already been discussed, there are significant data access and infrastructure challenges that ESMA has in relation to mandatory disclosure regimes.[887] Current RegTech solutions have been designed to address many of these challenges and could arguably be the essential missing piece required for a move from periodic reporting to real-time reporting.[888] This RegTech paradigm shift is key to opening the door to realistic expectations of moving to real-time reporting and supervision of mandatory disclosure regimes.[889]

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[883] Hofmann *et al*, *supra* note 73.
[884] The European Commission defines RegTech as a sub-set of FinTech 'that focuses on technologies that may facilitate the delivery of regulatory requirements more efficiently and effectively than existing capabilities'. It further defines SupTech as similarly a sub-set of FinTech 'that uses of innovative technology to support supervision. It helps supervisory authorities to digitise reporting and regulatory processes'. See, European Commission's 2020 Digital Finance Strategy (COM(2020) 591 final) fn 26 – 27.
[885] *Ibid*. For the purposes of this thesis, RegTech and SupTech are defined narrowly. RegTech refers to technology used by regulated entities to meet regulatory compliance requirements. SupTech refers to technology used by regulators for supervisory functions. Emerging technologies such as crypto-assets, digital currencies including Central Bank Digital Currencies (CBDC), blockchain, and Distributed Ledger Technology (DLT) are considered part of FinTech broadly and are not included under RegTech or SupTech in this research.
[886] E. Gerding, 'Disclosure 2.0: Can Technology Solve Overload, Complexity, and Other Information Failures?' (2017) *Securities Law Review* 173.
[887] D. Awrey and K. Judge, 'Why Financial Regulation Keeps Falling Short' (2020) 61(7) *Boston College Law Review* 2295. P.M. Batista and W. Ringe, 'Dynamism in Financial Market Regulation: Harnessing Regulatory and Supervisory Technologies' (2021) 4 *Stanford Journal of Blockchain Law & Policy* 1.
[888] ESMA, TRV No 1. 2019, p. 16, 28 February 2019, ESMA 50-165-737; available at: https://www.esma.europa.eu/sites/default/files/library/esma50-report_on_trends_risks_and_vulnerabilities_no1_2019.pdf (date accessed: 10 January 2026).
[889] Hofmann *et al*, *supra* note 73. D. Arner, J. Barberis and R. Buckley,, 'FinTech, RegTech, and the Reconceptualization of Financial Regulation' (2017) 37(3) *Northwestern Journal of International Law & Business* 376, 382. Also, see McCarthy, supra note 13.

The automation of regulatory tasks, such as reporting, has never been more possible than it is today.[890] By taking a significant amount of human interaction out of a process, it can be sped up and to a greater level of accuracy. However, the extent of human connection, supervision, and intervention may vary by technological application, by jurisdiction globally, and over time.[891] This real-time analysis is complicated by the vast amount of information that would be contained within submitted data sets, ultimately complicating the task of identifying 'unusual correlations, patterns and emerging risks, and for making predictions.'[892] RegTech increasingly serves as an intersection point between market participants and regulators, becoming an important area of focus within the EU's policy framework for fostering the digital transformation of financial services. However, this transformation is also driven by broader technological and market forces.

The increase in data and technological development has meant that there has been a regulatory shift to increased data-driven regulation. This can be seen in the increased requirement for regulatory reporting post-2008 financial crisis. A further catalyst to the RegTech era is the advent of machine-readable regulations, where computerised enhancements allow for the tagging of data sets and pairing with rules to facilitate automation and structuring of the data reported. Therefore, RegTech carries three significant advantages in making compliance automatic, immediate, and cost-effective.[893] The use of technology to move to real-time reporting has been proposed by academics and practitioners alike.[894]

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[890] A. Georgosouli, 'Metarules, Judgment and the Algorithmic Future of Financial Regulation in the UK' (2023) 43(4) *Oxford Journal of Legal Studies* 778.
[891] *Ibid*. U. Turksen, V. Benson and B. Adamyk, 'Legal Implications of Automated Suspicious Transaction Monitoring: Enhancing Integrity of AI' (2024) *Journal of Banking Regulation* 1. L. Enqvist, ''Human Oversight' in the EU Artificial Intelligence Act: What, When and By Whom?' (2023) 15(2) *Law, Innovation and Technology* 508. G. Fletcher and M. Le, 'The Future of AI Accountability in the Financial Markets' (2022) 24(2) *Vanderbilt Journal of Entertainment and Technology Law* 289.
[892] *Ibid*., 783.
[893] Zetzsche *et al*, *supra* note 83, 358. Also, see R. Buckley, D. Arner, D. Zetzsche, and R. Weber, 'The Road to RegTech: The (Astonishing) Example of the European Union' (2019) 21(1) *Journal of Banking Regulation* 26.
[894] C. Maple, *et al*, 'The AI Revolution: Opportunities and Challenges for the Finance Sector' (2023) *The Alan Turing Institute Report* 1. Hofmann *et al*, *supra* note 73. Zetzsche *et al*, *supra* note note 83 . G. Castellano, Ē.

ESMA has also indicated for several years that it is open to using these developments as a foundation upon which to develop its data-driven regulatory approach. ESMA has endorsed how RegTech technological solutions could help with regulatory supervision and decision-making, referring to the reality of real-time software interfaces.[895] Therefore, it represents the most immediate technological solution to facilitate a move to real-time regulatory reporting. As part of ESMA's data strategy over the next five years, it is evident that data – and its importance in the supervisory process – is the connecting factor between regulation and technology.[896] RegTech features heavily as the most effective way to support regulators with the data that they need to supervise and make decisions in a world of 'Big Data'. This extends to decisions made concerning systemic risk.[897]

Therefore, any future RTS and ITS that ESMA drafts during this five-year strategy period will reflect their data priorities. As the AIFMD II RTS and ITS are due to be drafted by 2027, there is a mandate for ESMA to build its strategy priorities into its Level 2 standards, which necessitates an operational and execution reliance upon technology. ESMA has been keen to keep up to date with changes in the RegTech markets as part of its semiannual reporting on trends, risks and vulnerabilities.[898]

Selga and D. Arner, 'The Emergence of Financial Data Governance and the Challenge of Financial Data Sovereignty' in A. Chander and H. Sun (eds.), *Data Sovereignty* (Oxford University Press 2023).

[895] ESMA, 'RegTech and SupTech – change for markets and authorities' (2019) 1 ESMA Report on Trends, Risks and Vulnerabilities 42, 44.

[896] ESMA Data Strategy 2023-2028, 15 June 2023: available at: https://www.esma.europa.eu/sites/default/files/2023-06/ESMA50-157-3404_ESMA_Data_Strategy_2023-2028.pdf (date accessed: 10 January 2026).

[897] *Ibid*., 4, 11 – 12. Hofmann *et al*, *supra* note 73.

[898] ESMA, TRV No 1. 2019, 28 February 2019, ESMA 50-165-737; available at: https://www.esma.europa.eu/sites/default/files/library/esma50-report_on_trends_risks_and_vulnerabilities_no1_2019.pdf (date accessed: 10 January 2026).

5.4.5.1. Challenges and opportunities of RegTech

RegTech is essential to real-time identification and combatting of systemic risk, but the challenge of real-time data transfer cannot be underestimated.[899] Using technology to achieve this outcome is not without its challenges. Some of the biggest data-related challenges include how to gather relevant information, process and structure such large volumes, protect the data, transfer it through reporting mechanisms and then for regulators to apply metrics to the data to facilitate the extraction of actionable intelligence *ex-ante*.[900] It is not restricted to reporting but also applies to the monitoring of the data and, ultimately, the detection of risks.[901] Although much discussion of RegTech seems to overlap with AI and leveraging such developments, it is arguable as to whether AI or complex algorithmic models are characteristic of current RegTech and SupTech applications.[902] It is more likely to involve forms of advanced data analysis and processing, rather than experimentation with generative AI.[903] The main difference between these two models is that analytical AI is based on drawing learning from existing data. This form of decision-making has been used in simplified applications for many years. At its heart is statistical-based machine learning. The

[899] X. Chao, Q. Ran, J. Chen, T. Li, Q. Qian, and D. Ergu, 'Regulatory Technology (Reg-Tech) in Financial Stability Supervision: Taxonomy, Key Methods, Applications and Future Directions' (2022) 80 *International Review of Financial Analysis* 1. Also, T. Adrian, 'AI and Regtech' IMF Virtual Workshop on AI & Finance 29 October 2021, available at: https://www.imf.org/en/News/Articles/2021/10/29/sp102921-ai-and-regtech (date accessed: 10 January 2026). EBA, 'EBA Analysis of RegTech in the EU Financial Sector' EBA Report 2021/17, 44. This has also been the message from the International Monetary Fund (IMF) as the IMF advocates that the use of RegTech and AI for real-time reporting frequency be introduced across financial markets.
[900] Zetzsche *et al*, *supra* note 83.
[901] *Ibid*.
[902] Tobias Adrian , Financial Counsellor and Director, Monetary and Capital Markets Department, IMF, 'AI and Regtech' Speech delivered at Virtual Workshop on AI & Finance October 29, 2021: available at: https://www.imf.org/en/News/Articles/2021/10/29/sp102921-ai-and-regtech (date accessed: 10 January 2026). Speech based on E. Boukherouaa and G. Shabsigh, 'Powering the Digital Economy: Opportunities and Risks of Artificial Intelligence in Finance' IMF Departmental Paper DP/2021/024, October 2021: available at: https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2021/10/21/Powering-the-Digital-Economy-Opportunities-and-Risks-of-Artificial-Intelligence-in-Finance-494717 (date accessed: 10 January 2026).
[903] Jermy Prenio, 'Peering Through the Hype - Assessing Suptech Tools' Transition from Experimentation to Supervision' (June 2024) (BIS Financial Stability Institute Insight on Policy Implementation No. 58); available at: https://www.bis.org/fsi/publ/insights58.pdf (date accessed: 10 January 2026).

current flavour of AI is more focused on generative AI applications, where human-like neural networks are developed to create new information or content in a more human-like way.[904]

At this point, it is crucial to be precise about the extent of the role that AI can play in mandatory reporting and whether any concerns arise in respect of the EU AI Act.[905] The EU AI Act establishes a tiered, risk-based framework regulating AI systems. This tiering represents the level of risk that the system poses to society. On one end of the spectrum there are limited and minimal-risk systems. Lighter requirements are applied to such systems. On the other end of the spectrum there are AI systems that pose unacceptable risks. The EU AI Act imposes strict obligations on these high-risk systems and in certain instances prohibits them. Such AI applications include use in credit scoring, biometric identification, or critical infrastructure as outlined in Annex III. It should also be noted that targeted simplification measures are currently being introduced through the Digital Omnibus on AI Regulation proposal,[906] which may further refine the obligations applicable to AI systems deployed in supervisory and regulatory contexts.

However, mandatory reporting of fund data, such as short positions, leverage, exposures, or top markets invested in, is all factual. The report to a regulator is a statement of historical fact rather than a prediction, recommendation or decision. Therefore, RegTech only needs to perform certain functions such as aggregate data, reconcile and structure the data, and report it in the predefined format. To do this, there is no problem-solving or deep learning AI capability needed in the sense of drawing insights or generating recommendations and

[904] T. Davenport and P. High, 'How Gen AI and Analytical AI Differ — and When to Use Each' (2024) 12 *Harvard Business Review* 1.
[905] Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) [2024] OJ L 1689.
[906] European Commission, 'Proposal for a Regulation of the European Parliament and of the Council amending Regulations (EU) 2016/679, (EU) 2018/1725, (EU) 2022/2065 and (EU) 2023/2854 and Directives 2000/31/EC, 2011/93/EU and (EU) 2016/680 as regards measures to reduce administrative burdens and compliance costs for the implementation of Union law in the digital field' (Digital Omnibus on AI Regulation) COM(2025) 836 final.

decisions. The capability needed is that of automation and analytics. RegTech tools used solely to aggregate, reconcile and report factual fund data fall within the minimal-risk category under the EU AI Act. This is because they do not make autonomous decisions affecting individuals or markets, and operate within a fully predefined and human-overseen reporting framework. Accordingly, no concerns arise under the EU AI Act in the context of using RegTech to fulfil mandatory disclosure regime obligations.

It should be acknowledged that there are many other secondary challenges with regard to RegTech from the perspective of market participants and regulators. These include how to ensure: data standardisation and that required fields within reports are interpreted and calculated in a uniform way, cybersecurity threats are mitigated so that reported data cannot be manipulated or stolen by a bad actor, and third-party discrepancies in the data processing and verification stages before onward reporting to a regulator or its appointed data repositories. With so many challenges inherent in a RegTech process, many market participants decide to build their own processes that they have complete control over, rather than using third parties and taking on board any additional risk of non-compliance. This is the dilemma as to whether to 'build-or-buy' a reporting solution.[907] Many choices must be made when using RegTech solutions because there are associated practical implementation challenges. For example, a 'build' system would entail a market participant implementing an in-house, specialised RegTech application on its own initiative and at its own expense. A 'buy' system would involve outsourcing to RegTech service providers at a potentially lower cost and without necessitating the training of staff. Either solution, which then seeks to include an integrated live feed into that portal or platform, will have significant

[907] *Ibid*., 9-10.

implementation and interoperability ramifications and challenges, especially in terms of memory and processing requirements.[908]

RegTech is helping to provide solutions to track the flow of funds around the world in the same way that weather and internet traffic are tracked around the world in real-time.[909] RegTech offers the ability to automate reporting, move to real-time frequency, and allow regulators to monitor big data and to identify and respond to financial market threats.[910] Most notable for this research is the ability of RegTech to facilitate the collection, analysis, and reporting of large sets of granular data in real-time.[911]

5.5. Practical methods of combatting systemic risk

As a natural corollary to the first argument that systemic risk must be identified in real time, it can be further argued that systemic risk must also be combatted in real time. Therefore, this part proposes that real-time reporting could provide additional information to existing real-time circuit breaker regimes to refine their trigger mechanisms. Reported information could provide additional insights into the operation of the trigger mechanism, rather than it being solely determined by reference to price movement. Such intervention decisions could be achieved through the use of technology. Alongside RegTech – which is designed for use by market participants – there is also SupTech, which is the supervisory technology used by the regulators to aggregate, structure, interpret and extract actionable intelligence from reported data sets.

[908] Teichmann *et al*, *supra* note 13. McCarthy, supra note 13.
[909] Papantoniou, *supra* note 13.
[910] *Ibid*., 3.
[911] Teichmann *et al*, *supra* note 13.

It should be noted that this part does not propose the creation of new asset management circuit breakers. Existing financial market circuit breakers, such as those provided for under MiFID II,[912] could be updated as part of the current MiFID II Level 2 RTS and ITS drafting by ESMA. However, as this chapter is focused on the proposed update to AIFMD, it will not go further than to recognise that MiFID II is going through its own Level 2 process. Within this separate MiFID II process, ESMA has an opportunity to make format-based and substantive adjustments to its circuit breaker regime.[913] Format-based adjustments focus on 'how' information is reported. Substantive adjustments focus on 'what' information is reported. For example, data fields required to be completed are format-related. The way in which the submitted data is calculated is an example of a substantive adjustment.

This part of the chapter will be divided into three sections. Firstly, the characteristics and nature of circuit breakers will be explained, in addition to highlighting the value of using real-time circuit-breaker regimes to combat systemic risk. Section 5.5.1 will argue that a real-time reporting system must be coupled with a real-time market intervention mechanism.

Secondly, in section 5.5.2., the existing asset management circuit breaker provided under the MiFID II[914] regime will be discussed as an instructive example. Particular emphasis will be

[912] Directive (EU) 2024/790 of the European Parliament and of the Council of 28 February 2024 amending Directive 2014/65/EU on markets in financial instruments, ELI: http://data.europa.eu/eli/dir/2024/790/oj. Regulation (EU) 2024/791 of the European Parliament and of the Council of 28 February 2024 amending Regulation (EU) No 600/2014 as regards enhancing data transparency, removing obstacles to the emergence of consolidated tapes, optimising the trading obligations and prohibiting receiving payment for order flow, ELI: http://data.europa.eu/eli/reg/2024/791/oj.

[913] ESMA, Third consultation Package (CP 3) On equity transparency (RTS 1 and CDR 2017/567), volume cap (RTS 3) circuit breakers (new RTS), SI (new ITS on SI notification), the equity CTP (new RTS on input / output data of the pre-trade and post-trade equity CTP) and the flags for non-equity transparency (RTS 2), 10 July 2024, ESMA74-2134169708-7011; available at: https://www.esma.europa.eu/sites/default/files/2024-07/ESMA74-2134169708-7011_MiFIR_Review_CP_3.pdf (date accessed: 10 January 2026). ESMA is shall develop draft regulatory technical standards under Article 48(5)(12) of MiFID II. Power is delegated to the Commission to supplement this Directive by adopting the regulatory technical standards referred to in the first subparagraph in accordance with Articles 10 to 14 of Regulation (EU) No 1095/2010.

[914] 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, [2014] OJ L173/349.

placed on the quantitative triggers of this MiFID II-based circuit breaker and the potential for qualitative additions to it. The argument of the chapter is that, rather than creating anything new, the identification and combatting of systemic risk can be improved by using existing technology, reporting regimes and circuit-breaker regimes. The MiFID circuit breaker could be updated to include qualitative elements in its triggers to give better accuracy and effectiveness to existing quantitative triggers. Although this circuit breaker is a model of real-time reporting, it is part of a parallel regime. Updates to this framework cannot be encompassed by the AIFMD II Level 2 measures. To reiterate, this research only references the MiFID II circuit breaker as an instructive example and will not be delving into the detail of the trigger metrics of this circuit breaker, since it is beyond the specific focus on possible amendments within AIFMD II Level 2.

Thirdly, in section 5.2.3., the development of SupTech as a tool to support the introduction of qualitative standards within circuit breaker trigger mechanisms will be addressed.

5.5.1. A circuit breaker regime

There are many different ways to combat systemic risk, ranging from regulating the remuneration of decision makers to increasing the capital reserves of market participants.[915] However, these mechanisms are not designed to combat in real-time. They operate after the risk event has crystallised. Increasingly, circuit breakers are being used within financial markets to simply slow down behaviour in an increasingly digitised financial market that is speeding up.

[915] J. Caruana, 'Systemic risk: how to deal with it?' Bank for International Settlements Paper 12 February 2010; available at: https://www.bis.org/publ/othp08.htm (date accessed: 10 January 2026).

Circuit breakers are designed to prevent a 'flash crash'. This is the name given to the almost instant loss of value in a market due to a rapid price drop. An example of this is the May 6, 2010, flash crash in the US when over a trillion dollars was lost off the Dow Jones Industrial Average in less than 30 minutes.[916] This debacle was specifically connected to algorithmic and high-frequency trading. It was facilitated by advancements in FinTech. Consequently, SupTech was partly born of the need to supervise the movement of data in the same time frame.[917] As will be discussed later, these circuit breakers are based on quantitative data to operate. The metrics of any quantitative mechanisms are the orders placed in the market, the price of the securities, how fast that price falls, and the volume traded. Circuit breakers act as a halt when these metrics indicate an imbalance that could lead to financial instability.

There are three categories of circuit breakers: order-imbalance circuit breakers, volume-induced circuit breakers, and price-change circuit breakers. Each circuit breaker has a different trigger and emphasises the centrality of how the triggers are structured and interpreted. Of these three categories, the price-change circuit breaker is the most common and includes price limit and trading halt mechanisms. Price limit mechanisms include order rejection and volatility interruption. Trading halt mechanisms include market-wide trading halts and single-instrument trading halts.[918] This is the category of circuit breakers that is arguably best suited to combatting systemic risk.

An example of an existing trading halt circuit breaker in the US is the SEC's Stock Market-Wide Circuit Breaker.[919] This mechanism operates as a cross-market trading halt on

[916] S. Zeranski and I. Sancak, 'Prudential Supervisory Disclosure (PSD) with Supervisory Technology (SupTech): Lessons from a FinTech Crisis' (2021) 18 *International Journal of Disclosure and Governance* 315.
[917] *Ibid*.
[918] P. Gomber, B. Clapham, M. Haferkorn, S. Panz and P. Jentsch, 'Circuit Breakers – A Survey among International Trading Venues' WFE Research Working Paper, 23 September 2016; available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3120370 (date accessed: 10 January 2026).
[919] Securities Exchange Act Release No. 67090 (May 31, 2012), 77 FR 33531 (June 6, 2012) (SRBATS-2011-038; SR-BYX-2011-025; SR-BX-2011-068; SR-CBOE-2011-087; SR-C2-2011-024;

stocks and indices. The trading halt occurs in three levels when a price drops by 7%, 13% and 20%. The first and second level triggers at 7% and 13% will halt the trading of the stock or index for 15 minutes if the fall occurs before 3.25 pm. The third-level trigger at 20% will halt trading for the remainder of the day, irrespective of what time of the day it occurs.[920]

An example of an existing price limit circuit breaker is the SEC's Limit Up - Limit Down Circuit Breaker.[921] This circuit breaker is a market volatility preventative mechanism that combats large, sudden price movements. The way that it achieves this is by placing bands of acceptable price movement. The band is set at a certain predetermined percentage above and below the average price movement for the stock in the previous five-minute period. If a price movement goes outside the band, then trading will pause for five minutes.[922] Similar circuit breaker regimes operate in the EU and UK stock markets.[923]

ESMA and the ESRB have both emphasised the importance of harmonised and data-driven volatility controls across EU trading venues. ESMA has recommended the consistent

SR-CHX2011-30; SR-EDGA-2011-31; SR-EDGX-2011-30; SR-FINRA-2011-054; SR-ISE-2011-61; SR-NASDAQ2011- 131; SR-NSX-2011-11; SR-NYSE-2011-48; SR-NYSEAmex-2011-73; SR-NYSEArca-2011-68; SRPhlx-2011-129) ("MWCB Approval Order").

[920] K. Lin, P. Gurrola-Pérez and B. Speth, 'Circuit Breakers and Market Quality' *WFE Research Working Paper No. 3*, September 2022, 4; available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4132469 (date accessed: 10 January 2026).

[921] Securities and Exchange Commission (Release No. 34-67091; File No. 4-631) May 31, 2012 Joint Industry Plans; Order Approving, on a Pilot Basis, the National Market System Plan to Address Extraordinary Market Volatility by BATS Exchange, Inc., BATS Y-Exchange, Inc., Chicago Board Options Exchange, Incorporated, Chicago Stock Exchange, Inc., EDGA Exchange, Inc., EDGX Exchange, Inc., Financial Industry Regulatory Authority, Inc., NASDAQ OMX BX, Inc., NASDAQ OMX PHLX LLC, The Nasdaq Stock Market LLC, National Stock Exchange, Inc., New York Stock Exchange LLC, NYSE MKT LLC, and NYSE Arca, Inc.

[922] Securities and Exchange Commission (Release No. 34-67091; File No. 4-631) May 31, 2012 Joint Industry Plans; Order Approving, on a Pilot Basis, the National Market System Plan to Address Extraordinary Market Volatility by BATS Exchange, Inc., BATS Y-Exchange, Inc., Chicago Board Options Exchange, Incorporated, Chicago Stock Exchange, Inc., EDGA Exchange, Inc., EDGX Exchange, Inc., Financial Industry Regulatory Authority, Inc., NASDAQ OMX BX, Inc., NASDAQ OMX PHLX LLC, The Nasdaq Stock Market LLC, National Stock Exchange, Inc., New York Stock Exchange LLC, NYSE MKT LLC, and NYSE Arca, Inc. See SEC announcement of circuit breaker measures introduced to address market volatility and associated rule amendment notices; available at: https://www.sec.gov/oiea/investor-alerts-bulletins/investor-alerts-circuitbreakersbulletin (date accessed: 10 January 2026).

[923] J. Lee and L. Schu, 'Regulation of Algorithmic Trading: Frameworks for Human Supervision and Direct Market Interventions' (2022) 33(2) *European Business Law Review* 193.

calibration of trading halts and volatility interruption mechanisms across Member States. It has done this to reduce fragmentation and prevent cross-venue arbitrage during periods of stress. The ESRB has supported the position that circuit breakers should be embedded within a broader macroprudential framework. This position highlights the need for real-time monitoring of order book depth, leverage indicators and cross-asset contagion channels. Together, ESMA and the ESRB have encouraged supervisors to integrate circuit-breaker information into systemic risk dashboards to support coordinated interventions during market turmoil.[924]

A circuit breaker is a mechanism used to protect the market from panic selling by investors or algorithms due to market volatility.[925] Such panic can induce both algorithmic and non-algorithmic decision-making that can cause a stock or index price to collapse. The circuit breaker acts as a 'time out' or dampener of such volatility. However, using price movement as the sole basis for a circuit breaker trigger ignores the context within which the price fall occurs. For example, a price fall may be the result of a legitimate decrease in the asset value of a company, decreased profits, or an obsolete product range. However, the fall could also be due to short sellers attacking the share price of a company in a predatory way for a reason other than for its asset value or for decreases in profitability.[926] The quantitative element of a circuit breaker trigger needs to be coupled with a qualitative element, as will be elaborated on below.

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[924] ESMA, Supervisory briefing: On the calibration of circuit breakers, 12 October 2023, p. 6; available at: https://www.esma.europa.eu/sites/default/files/2023-10/ESMA74-2134169708-6975_Supervisory_Briefing_Circuit_Breakers.pdf (date accessed: 10 January 2026). Also, see ESRB, ESRB Policy; available at: https://www.esrb.europa.eu/mppa/html/index.en.html (date accessed: 10 January 2026).

[925] D. Bongaerts, S. De Luca and M. Van Achter, 'Circuit Breakers and Market Runs' (2024) 28 *Review of Finance* 1953. J. Nahar, N. Nishat, A. Shoaib and Q. Hossain, 'Market Efficiency and Stability in the Era of High-Frequency Trading: A Comprehensive Review' (2024) 1(3) *International Journal of Business and Economics* 1.

[926] M. Loewenstein, 'Short Squeeze, GameStop, the Common Law and a Call for Regulation' (2022) 50 *Securities Regulation Law Journal* 1.

There is much research undertaken into the ability of circuit breakers to stabilise markets.[927] Circuit breakers can deter panic within markets and promote rational decision-making in markets that have become overheated and threaten 'flash-crash'.[928] However, there is also market evidence that supports the argument that circuit breakers do not combat systemic risk and, to the contrary, may even cause panic in the market.[929] Market liquidity supports stability. By its nature, a circuit breaker places a limit on liquidity in the market and hence may facilitate instability. This is known as the 'magnet effect' where instability becomes a self-fulfilling prophecy.[930] There is also the theory that halting trading on one venue or market only pushes the trading of the security or index onto a different venue or market that is still trading.[931]

Irrespective of the research producing arguments for or against the use of circuit breakers, it can be argued that volatile price swings have the potential to create market instability. Therefore, any mechanism that seeks to dampen such volatility is a candidate for combatting systemic risk. As advanced by this chapter, the regulatory focus on reporting should be connected with a market intervention mechanism of circuit-breaking.

It should be clarified that the proposal of this research is not to create new categories of circuit breakers. Circuit breakers operate based on numerical information. Within the

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[927] I. Sifat and A. Mohamad, 'Circuit Breakers as Market Stability Levers: A Survey of Research, Praxis, and Challenges' (2019) 24(3) *International Journal of Finance & Economics* 1130.
[928] *Ibid*., 1132.
[929] X. Li and W. Yao, 'Do Market-Wide Circuit Breakers Calm Markets or Panic Them? Evidence from the COVID-19 Pandemic' (2021) Working Paper; available at: https://ssrn.com/abstract=4573595 (date accessed: 10 January 2026). Bongaerts *et al*, *supra* note 154. K. Lin, P. Gurrola-Perez and B. Speth, 'Circuit Breakers and Market Quality' (2022) 3 WFE Working Paper 1; available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4132469 (date accessed: 10 January 2026).
[930] I. Sifat, 'A Survey on the Magnet Effect of Circuit Breakers in Financial Markets' (2020) 69 *International Review of Economics and Finance* 138. A. Subrahmanyam, 'Circuit Breakers and Market Volatility: A Theoretical Perspective' (1994) 49(1) *The Journal of Finance* 237.
[931] FCA, 'Catching a falling knife: an analysis of circuit breakers in UK equity markets' 3 August 2017; available at: https://www.fca.org.uk/publications/research/analysis-circuit-breakers-uk-equity-markets (date accessed: 10 January 2026).

investment industry, there are already circuit breakers that operate based on numerical triggers such as security price.[932] A significant problem that exists concerning circuit breakers is knowing when they are appropriate to invoke. The current triggers are quantitative in nature and simply operate based on price movement, irrespective of what is generating that price move. The enhancement that is needed for circuit breakers is qualitative in nature.

However, there is an inherent paradox that must be addressed to foreground this differentiation between quantitative and qualitative triggers. Quantitative triggers are purely based on numerical analysis, irrespective of what the numbers represent. Qualitative triggers are similarly represented numerically, but represent a context within which change is occurring. This is because circuit breakers are mechanical and automated systems. This means that they can only receive and act based upon numerical inputs. All circuit breakers operate based upon a number-based logic. A qualitative trigger therefore requires the underlying judgment. For example, does a price movement reflects genuine market stress rather than ordinary market volatility. This qualitative assessment needs to be translated into a numerical threshold or parameter so that the circuit breaker can interpret and action it. The distinction between quantitative and qualitative triggers lies in the nature of the analysis informing the number, not in the form of the output itself. Hence, a qualitative judgment is ultimately expressed in the form that a circuit breaker mechanism can understand and act upon.[933]

A behavioural pattern, such as short-selling or the concentration of orders in a particular category of market participant, such as hedge funds, still requires a number to act as a trigger to a circuit breaker regime. An example of this might be where seventy-five per cent of short-selling a position within a predetermined timeframe is undertaken by EU hedge funds.

[932] *Ibid.*, 167, 168, 169.
[933] D. Bongaerts, S. De Luca and M. Van Achter, 'Circuit Breakers and Market Runs' (2024) 28(6) *Review of Finance* 1953.

That is a numerically represented qualitative insight which can be interpreted by a circuit breaker regime.

The differentiation between quantitative and qualitative information, metrics or triggers creates a paradox as applied to the proposals of this thesis because even the qualitative metrics must ultimately be expressed numerically. The purpose of this research is not to resolve this paradox, but to simply recognise that it exists in trying to address and define qualitative information more clearly.

Qualitative information is that which helps to provide context to the order, price or volume quantity changes. For example, qualitative information could include providing information on short selling, leveraging or rehypothecation of assets to help a regulator to understand the underlying reason why the order, price and volume of a security are rapidly changing. This qualitative information, added to the quantitative information, could help in deciding when the circuit breaker should be triggered. Qualitative information can help determine if a price change reflects a fundamental value change or irrational behaviour. It is to determine if the lack of market liquidity is going to cause a bigger systemic issue. The proposal of this research is that real-time sector-specific data can supply the regulator with the necessary qualitative information to interpret and create an appropriate response through existing circuit breaker regimes.

5.5.2. The MiFID II circuit breaker mechanism

MiFID II has followed the US approach and continues the use and development of circuit breakers and price collars, which are analogous to the US Market-Wide Circuit Breaker and

Limit Up - Limit Down Circuit Breakers discussed above.[934] As described above, ESMA research has suggested the use of regulatory suspensions and technical halts.[935] Furthermore, ESMA has proposed the use of a circuit breaker in the wake of COVID-19 market volatility.[936] In addition to ESMA, the ESRB has long supported the use of circuit breaker regimes to allow a macro-prudential regulator to effectively dampen systemic risk to prevent the destabilising of financial markets.[937]

The amendments to MiFID II and MiFIR represented in the MiFID III text were approved on 28 March 2024 with an associated transposition date of 29 September 2025.[938] This marks a significant move to a Single Rulebook for the EU securities market.[939] The responsibility to develop the RTS to create this consolidated tape has been given to ESMA.[940] Level 2 RTS and ITS must be developed within 6 to 18 months.[941] Those RTS and ITS are due to cover trading venues and mechanisms to halt and constrain trading. Therefore, as well as AIFMD II

[934] 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, [2014] OJ L173/349, Article 48(5).
[935] C. Guillaumie, G. Loiacono, C. Winkler and S. Kern, 'Market impacts of circuit breakers – Evidence from EU trading venues' (2020) ESMA Working Paper 4; available at: https://www.esma.europa.eu/sites/default/files/library/esmawp-2020-1_market_impacts_of_circuit_breakers.pdf (date accessed: 10 January 2026). Also, see 5.5.1.
[936] ESMA Supervisory Briefing on the calibration of circuit breakers, 12 October 2023; available at: https://www.esma.europa.eu/sites/default/files/2023-10/ESMA74-2134169708-6975_Supervisory_Briefing_Circuit_Breakers.pdf (date accessed: 10 January 2026).
[937] European Systemic Risk Board, 'The ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector' June 2015, p. 7; available at: https://www.esrb.europa.eu/pub/pdf/other/150625_esrb_handbook_addendum.en.pdf (date accessed: 10 January 2026).
[938] Directive (EU) 2024/790 amending the MiFID II Directive (2014/65/EU) and Regulation (EU) 2024/791 amending the Markets in Financial Instruments Regulation (600/2014) (MiFIR) as regards enhancing data transparency, removing obstacles to the emergence of consolidated tapes, optimising the trading obligations and prohibiting receiving payment for order flow.
[939] ESMA Policy Statement, 'Transition for the application of the MiFID II/MiFIR review' 27 March 2024; available at: https://www.esma.europa.eu/sites/default/files/2024-03/ESMA74-2134169708-7163_Public_statement_on_specific_revised_MiFIR_provisions.pdf (date accessed: 10 January 2026).
[940] Regulation (EU) 2024/791 of the European Parliament and of the Council of 28 February 2024 amending Regulation (EU) No 600/2014 as regards enhancing data transparency, removing obstacles to the emergence of consolidated tapes, optimising the trading obligations and prohibiting receiving payment for order flow, ELI: http://data.europa.eu/eli/reg/2024/791/oj, Article 22b.
[941] ESMA, Third consultation Package (CP 3) On equity transparency (RTS 1 and CDR 2017/567), volume cap (RTS 3) circuit breakers (new RTS), SI (new ITS on SI notification), the equity CTP (new RTS on input / output data of the pre-trade and post-trade equity CTP) and the flags for non-equity transparency (RTS 2), 10 July 2024.

Level 2 measures, ESMA currently has a live mandate to draft Level 2 measures for the MiFID regime. The relevant part of these regulatory developments for this research is the development of a real-time consolidated tape in the bond and derivative markets. The circuit breaker in equity markets works based on the price quoted on the consolidated tape. The development of a similar tape in bond and derivative markets means that part of the mechanism needed to facilitate the operation of a circuit breaker could potentially be put in place by this real-time transparency mechanism.[942]

MiFID II provides for the operation of circuit breakers across EU trading venues known as Regulated Markets (RMs),[943] Multilateral Trading Facilities (MTFs) and Organised Trading Facilities (OTFs)[944] in order to safeguard against market volatility.[945] National Competent Authorities are permitted to temporarily halt or constrain trading based on significant, rapid price movement.[946] Such mechanisms must be tested periodically before and after implementation.[947] Individual trading venues must keep records of the mechanisms used and

[942] ESMA, MiFIR review Final Report: Review of RTS 2 on transparency for bonds, structured finance products and emission allowances and RTS on reasonable commercial basis, 16 December 2024; available at: https://www.esma.europa.eu/sites/default/files/2024-12/ESMA74-2134169708-7775_MiFIR_Review_Final_Report_on_amendment_of_RTS_2_and_RTS_on_RCB.pdf (date accessed: 10 January 2026). Also, see Regulation (EU) 2024/791 of the European Parliament and of the Council of 28 February 2024 amending Regulation (EU) No 600/2014 as regards enhancing data transparency, removing obstacles to the emergence of consolidated tapes, optimising the trading obligations and prohibiting receiving payment for order flow; available at: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:L_202400791 (date accessed: 10 January 2026).

[943] 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, [2014] OJ L173/349, Article 48(5).

[944] 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, [2014] OJ L173/349, Article 18(5).

[945] Whilst MiFID III does not propose to introduce new circuit breaker rules, it does enhance the market resilience and investor protection mechanisms of MiFID II. It requires greater transparency on order execution, trading venues and execution strategies. These updates may have an indirect impact on how circuit breakers are operated. However, the rules outlined in Article 48(5) of MiFID II are not proposed to be amended. Directive (EU) 2024/790 (the MiFIR review) amending the MiFID II Directive (2014/65/EU) and Regulation (EU) 2024/791 amending the Markets in Financial Instruments Regulation (600/2014) (MiFIR) addresses the enhancing of data transparency, removing obstacles to the emergence of consolidated tapes, optimising the trading obligations and prohibiting receiving payment for order flow.

[946] Regulation (EU) 2017/584 of 14 July 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards specifying organisational requirements of trading venues, [2017] OJ L87/350, Article 19.

[947] Regulation (EU) 2017/584 of 14 July 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards specifying organisational requirements of trading venues, [2017] OJ L87/350, Article 19(2).

ensure that all automated mechanisms can be manually overridden.[948] Such mechanisms have proved successful in their operation during the COVID-19 pandemic and the war in Ukraine, but have largely remained untested in terms of a major global systemic event and untested in derivative markets where calibrations differ significantly.[949]

However, each trading venue can have different rules, mechanisms, and manual overrides. Therefore, ESMA has provided guidelines on the calibration of circuit breakers.[950] These guidelines provide for how circuit breakers should be calibrated at the asset class level, at more granular levels, based on liquidity or volatility of the instrument level.[951] These guidelines to the regime are designed to enhance and improve market transparency, investor protection, and the robustness of the financial markets within the European Union.

The guidelines provided by ESMA clarify new and existing rules related to significant areas of change, such as the volume cap mechanism, equity and non-equity transparency, the systematic internaliser regime, designated publishing entities, and reporting enhancements.[952] This includes a transition from a dual to a single volume cap and the continued application of the current double volume cap until the new rules take effect, 18 months post-implementation.[953]

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[948] Regulation (EU) 2017/584 of 14 July 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards specifying organisational requirements of trading venues, [2017] OJ L87/350, Article 19(3).
[949] ESMA, Supervisory briefing: On the calibration of circuit breakers, 12 October 2023, p. 4-5; available at: https://www.esma.europa.eu/sites/default/files/2023-10/ESMA74-2134169708-6975_Supervisory_Briefing_Circuit_Breakers.pdf (date accessed: 10 January 2026).
[950] 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, [2014] OJ L173/349, Article 48(13).
[951] ESMA, Guidelines on Calibration of circuit breakers and publication of trading halts; available at: https://www.esma.europa.eu/sites/default/files/library/esma70-872942901-63_mifid_ii_guidelines_on_trading_halts.pdf (date accessed: 10 January 2026).
[952] ESMA, *supra* note 180 and 182.
[953] Article 5 of MiFIR introduces a mechanism that caps the amount of trading carried out under: (i) systems matching orders based on a trading methodology under which the price is determined in accordance with a reference price; and (ii) negotiated transactions in liquid instruments pursuant to article 4(1)(b) of MiFIR. The double volume cap is designed to ensure that the use of waivers from pre-trade transparency does not unduly

The primary challenge concerning circuit breaker regimes is knowing when to make use of them. The main question surrounds when the legitimate liquidity in a market trumps the welfare effects of preventing a run. However, it is extremely difficult for a regulator to know exactly when this point has been reached, and the circuit breaker should be triggered to ideally allow intervention to be based on both quantitative and qualitative considerations.[954] The MiFID Circuit Breaker has a manual override to allow a regulator to prevent its inappropriate use.[955] This is evidence that a quantitative trigger can be inappropriately actioned when a further assessment of the context of the change dictates otherwise. Providing an override capability is an acknowledgement that the trigger mechanism needs to be constantly reviewed for appropriateness. Hence, the additional reporting from the asset management industry through an enhanced and aligned AIFMD and UCITS regime could provide useful additional information to help better define the calibration of the circuit breaker trigger mechanism with a qualitative characteristic. Therefore, the proposal of this part is that ESMA look to use the data submitted as part of the AIFMD and UCITS regimes to inform the qualitative elements of a future trigger mechanism provided for under Level 2 RTS and ITS and Level 3 Guidelines for the MiFID regime.

5.5.2.1. Using real-time data to improve circuit breaker trigger effectiveness in combatting systemic risk

harm price formation. See also, ESMA Policy Statement, 'Transition for the application of the MiFID II/MiFIR review' 27 March 2024; available at: https://www.esma.europa.eu/sites/default/files/2024-03/ESMA74-2134169708-7163_Public_statement_on_specific_revised_MiFIR_provisions.pdf (date accessed: 10 January 2026).

[954] Bongaerts *et al*, *supra* note 156.

[955] 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, [2014] OJ L173/349, Article 48(5) as supported by Regulation (EU) 2017/584 of 14 July 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards specifying organisational requirements of trading venues, [2017] OJ L87/350, Article 19(4). This RTS is known as RTS 7.

This research proposes that ESMA could overlay its circuit breaker intervention with more qualitative indicators from real-time asset management reporting regimes. As indicated above, these qualitative indicators could be based on whether selling is happening through short-selling practices, leveraging or rehypothecation.[956] This could be done in all EU circuit breaker regimes.

To take the example of equity markets, there is currently a two-stage process of real-time intervention. Firstly, a consolidated tape creates a real-time view of equity market prices.[957] Secondly, those real-time equity market prices feed a real-time circuit-breaking regime whereby market trading is suspended if equity prices fall sharply within a short timeframe. In terms of future regime development in debt markets, additional contextual data that could be considered in addition to price could be volume, leverage, collateral, rehypothecation, margin haircuts, embedded derivatives or other key debt-related exposure metrics.[958] In conjunction with a developed consolidated tape, the use of circuit breakers in real-time could serve to mitigate systemic risk at the materialisation stage.[959] However, again, it is worth noting that the focus of this chapter is not to present detailed proposals on how a consolidated tape or circuit breaker may be modified.

5.5.2.2. Disadvantages of circuit breakers

[956] Rehypothication is the process by which by which a broker or financial institutions uses collateral posted by clients for its own purposes and profit.
[957] ESMA, *supra* note 173. Also, see European Commission, 'The Study on the Creation of an EU Consolidated Tape – Final Report of the European Commission' September 2020; available at: https://op.europa.eu/en/publication-detail/-/publication/e6ef0fed-1cbf-11eb-b57e-01aa75ed71a1 (date accessed: 10 January 2026).
[958] FCA, 'Consultation Paper CP23/15: The Framework for a UK Consolidated Tape' July 2023; available at: https://www.fca.org.uk/publication/consultation/cp23-15.pdf (date accessed: 10 January 2026).
[959] *Ibid*., 20.

Circuit breakers also have potential disadvantages. As well as the benefit of creating stability through information flow and market liquidity, empirical evidence from many markets around the globe (including EU Member States and the US) has shown, albeit without consensus of regulators, that the following are negative outcomes of circuit breakers.[960] Firstly, a halt in trading reduces liquidity in the market.[961] Secondly, a circuit breaker may interfere with the natural movement of security prices and the efficacy of the market in redistributing information.[962] Thirdly, larger investors will be aware of trading rules and may trade ahead of a halt, leaving small retail investors to suffer from higher trading costs and restricted opportunities.[963] Fourthly, a circuit breaker may increase volatility in the market by forcing market participants to trade before a halt comes into place. This increased selling drives prices downward and the likelihood of triggering a circuit breaker upward. This is known as the magnet effect.[964] Fifthly, a trading halt may smooth out rapid price falls, but it may not stop a gradually declining price trend. Price limit circuit breakers have been shown to display similar concerns.[965]

Possibly the most important issue with circuit breakers is that they are not designed to prevent price adjustments, rapid or gradual, that are connected to standard changes in fundamental value.[966] They are designed to dampen irrational behaviour. However, systemic risk is not always the result of irrational behaviour. Systemic risk can be the result of rapid changes in the fundamental value of securities, due to widespread market default connected

[960] L. Ackert, 'The impact of circuit breakers on market outcomes' (2012) Economic Impact Assessment EIA9 of UK Government Office for Science; available at: https://assets.publishing.service.gov.uk/media/5a7ca6eaed915d7c983bc0fb/12-1070-eia9-impact-circuit-breakers-on-market-outcomes.pdf (date accessed: 10 January 2026). Bongaerts *et al*, *supra* note 154. H. Chen, A. Petukhov, J. Wang, and H. Xing 'The Dark Side of Circuit Breakers' (2024) 79(2) *The Journal of Finance* 1405.
[961] Ackert, *supra* note 191, 4.
[962] *Ibid.*, 6.
[963] *Ibid*.
[964] *Ibid.,* 7.
[965] *Ibid*.
[966] *Ibid*., 13.

to the overleveraging of debt. Increased information flow could prove beneficial in making an assessment of the rationality of any price movement and consequently, the nature of the systemic risk. Therefore, the proposal of this research is the modification of circuit breaker triggers as applied to asset management based on the real-time information flow of portfolio information. For example, knowing if selling is of a long or short position is very important. The accumulation of a short sale position in a single stock across the hedge fund industry may indicate that a stock is being attacked. In such a scenario, the context of the falling price is that price is being attacked. If a price fall is due to a stock having a falling fundamental value, then generally long positions will be sold. Similarly, when positions are short sold through derivative positions, the accumulation of those positions across the market may help clarify the motivation behind the selling occurring and by whom.[967]

5.5.3. Circuit breaker triggers

Percentage triggers need to be broadened to include qualitative elements rather than just being based on price movement. This is because the risk associated with circuit breakers is that they get triggered and prevent a rapid price decrease, even when the price decrease relates to a security with little fundamental value.[968] This occurred in relation to GameStop stock, where institutional investors, such as hedge funds short-sold the stock to collapse the price of the stock as the fundamental value of the company had collapsed due to their electronic products becoming obsolete. However, retail investors started buying the stock to prevent the triggering of the circuit breaker and to push the price of the stock up, resulting in a 'short squeeze' whereby hedge funds started losing money because the price was rising when they were betting that it would drop. The triggering of the stock price of GameStop was

[967] See 1.5.3.
[968] Loewenstein, *supra* note 157.

ignorant of the battle going on between the hedge fund industry, GameStop and retail investors. This is why qualitative context needs to be built into a circuit breaker. Part of the trigger needs to include whether the price adjustment is due to panic or a change in fundamental value, whether halting will have a disproportionate market liquidity effect, or whether smaller investors will simply bear the impact rather than larger investors. The trigger system needs to be customised. Furthermore, the halting system could be tapered to a red, amber and green setting rather than simply going from green to red and back.

However, the operation of a circuit breaker regime would need to have a cross-sectoral and cross-border character, as trading venues are open to more than just hedge fund market participants. Within the EU, the European Commission has already recognised this issue in its strategy for supervising data in financial services.[969] The EU markets would also need to align with the UK and US markets, and data sharing would need to be part of an overall systemic risk strategy because systemic risk is subject to the contagion effect, which means it operates across borders. Also, the UK and the US would similarly need to move to a real-time reporting and circuit-breaking mechanism to combat a risk that operates at a global level.

Such a cross-border strategy would only be possible through the use of RegTech and SupTech platforms which service market participants across these jurisdictions.[970] However, other additional issues may also need to be considered, such as the operational and legal alignment of those institutions. The starting point must be to implement circuit breaker mechanism changes within existing EU circuit breaker regimes, as the operational infrastructure is

[969] European Commission (2021), Strategy on Supervisory Data in EU Financial Services, COM(2021) 798 final, p. 3.
[970] The Cambridge Centre for Alternative Finance, The Global RegTech Industry Benchmark Report 2019, Figure E2; available at: https://www.jbs.cam.ac.uk/wp-content/uploads/2020/08/2019-12-ccaf-global-regtech-benchmarking-report.pdf (date accessed: 10 January 2026).

already in place. The most straightforward way to introduce the legal and regulatory basis for the change is through a Level 2 update of RTS and ITS, where ESMA has significant influence over the recommended amendments submitted to the European Commission, while final approval remains with the legislator in line with the Meroni Doctrine.[971] Greater convergence can ultimately be achieved by standardising international approaches towards circuit breakers. Further research would need to be undertaken in relation to the technical workings of a circuit breaker. This chapter is merely making the foundational argument that real-time data from the AIFMD reporting regime could be used to support the introduction of qualitative elements to a real-time circuit breaker trigger mechanism.

5.5.4. SupTech as a support to proposed qualitative trigger elements

At this point in the chapter, having addressed the role of RegTech in facilitating mandatory disclosure and its suitability as a regulatory tool to identify systemic risk emanating from the hedge fund industry, it is necessary to address the use of technology to facilitate supervisors' intervention to combat systemic risk. SupTech is utilised by regulatory authorities to facilitate regulatory assessments about when to intervene in a market. Hence, the recommendation of this part will be the use of SupTech to enhance the identification of existing circuit breaker triggers and those being developed for trading venues in derivative and debt markets.

As indicated above in this part,[972] SupTech, shorthand for supervisory technology, is the solution used by a regulator to oversee the market. According to di Castri, there are four generations of SupTech. The first generation is paper-based and manually input to generate descriptive analysis. The second generation is web-based and can provide limited diagnostic

[971] Meroni & Co, Industrie Metallurgiche SpA v High Authority of the European Coal and Steel Community (Case 9/56) [1958] ECR 133 (CJEU).
[972] See 5.4.5.

insights. The third generation is where big data is factored into the predictive analytics capabilities of the system. The fourth generation is the ability of the system to use machine learning to engage in prescriptive analytics, which creates action plans.[973]

Currently, SupTech is used *ex-ante* and is, therefore, especially suited to tasks such as monitoring insider dealing, market manipulation and misconduct and other functions that do not need to be undertaken in real-time.[974] The advent of 'big data' makes SupTech the future tool of choice for real-time analysis of granular regulatory reporting.[975] International supervisors, such as the ECB are making significant progress in taking this big data and real-time AI-driven banking trend in the market and matching it with developments in SupTech systems.[976] The Financial Stability Institute is also assessing the use of generative artificial intelligence in the supervisory process to act as a chatbot that can answer questions and also as a data co-pilot.[977]

The development of ChatGPT and other large language models (LLMs) means that generative AI has developed faster in the direction of human language processing and

[973] S. di Castri, 'The suptech generations' FSI Insights on policy implementation No 19, October 2019; available at: https://www.bis.org/fsi/publ/insights19.pdf (date accessed; 9 November 2025). S. di Castri et al, 'State of SupTech Report 2022' (2023) *University of Cambridge Report* 25; available at: https://www.jbs.cam.ac.uk/wp-content/uploads/2023/01/2023-ccaf-state-of-suptech-report.pdf (date accessed: 10 January 2026). FSB, 'The Use of Supervisory and Regulatory Technology by Authorities and Regulated Institutions: Market developments and financial stability implications' Report to the G20, 9 October 2020, p. 24; available at: https://www.fsb.org/wp-content/uploads/P091020.pdf (date accessed: 10 January 2026). According to the 2020 FSB survey, 49% of supervisors use first-generation descriptive models. 32% use second-generation diagnostic models. 11% use third-generation predictive models. 8% use fourth-generation prescriptive models. However, the 2022 University of Cambridge survey found that only 71% of supervisors had a SupTech solution. Therefore, there are arguably gaps in the use of SupTech and which generation of SupTech is being used. Also, see Cambridge Centre for Alternative Finance, Cambridge SupTech Lab State of SupTech Report 2024; available at: https://lab.ccaf.io/stateofsuptech/ (date accessed: 10 January 2026).

[974] OECD, 'The use of SupTech to enhance market supervision and integrity' in *OECD Business and Finance Outlook 2021: AI in Business and Finance* (OECD Publishing 2021).

[975] FSB, *supra* note 204.

[976] ECB Supervision Letter, 'Suptech: thriving in the digital age' 15 November 2023; available at: https://www.bankingsupervision.europa.eu/press/supervisory-newsletters/newsletter/2023/html/ssm.nl231115_2.en.html (date accessed: 10 January 2026).

[977] J. Prenio, 'Peering through the hype – assessing suptech tools' transition from experimentation to supervision' FSI Insights on policy implementation No 58, June 2024; available at: https://www.bis.org/fsi/publ/insights58.pdf (date accessed: 10 January 2026).

generation.[978] ChatGPT and LLMs are types of AI designed to understand and generate human language. They are trained on vast amounts of text from books, articles, websites, and other online sources. It allows them to recognise patterns in how words, sentences, and ideas are connected. This enables them to perform generative tasks that are human-like. The development of a similar level of development and progress in data and decision-making by AI is not as advanced. Overall, both of these AI solutions are in their infancy and in most instances still in their development. However, over half of supervisors are using SupTech as part of their supervisory processes.[979]

The exact impact of AI on automated RegTech and SupTech processes remains to be seen. Whilst the integration of AI into these processes holds significant promise, the extent to which it will transform supervisory and reporting functions in practice is still evolving. What is already evident, however, is that diagnostic AI processes have identifiable application and uses in stress testing contexts. The EBA has observed that advanced analytics can be applied to supervisory assessments, including scenario analysis and stress testing.[980] It is arguable that variations of these diagnostic applications could be developed over time for SupTech purposes, enabling supervisors to draw more granular and forward-looking insights from reported data. There is already active consideration among supervisory authorities as to how AI competencies within supervision can be systematically improved. For example, Crisanto *et al*, highlight the importance of building institutional capacity to harness AI tools

[978] Bick *et al*, 'The Rapid Adoption of Generative AI' (Sept 2024); available at: https://www.nber.org/papers/w32966 (date accessed: 10 January 2026).
[979] Financial Stability Board, 'The Financial Stability Implications of Artificial Intelligence' 14 November 2024; available at: https://www.fsb.org/uploads/P14112024.pdf (date accessed: 10 January 2026) Also, see Cambridge Centre for Alternative Finance (2023), Cambridge SupTech Lab: State of SupTech Report 2023; available at: https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/state-of-suptech-report-2023 / (date accessed: 10 January 2026).
[980] European Banking Authority, 'Report on Big Data and Advanced Analytics' (EBA, 2020); available at: https://www.eba.europa.eu/sites/default/files/document_library/Publications/Reports/2020/897990/EBA%20report%20on%20big%20data%20and%20advanced%20analytics.pdf (date accessed: 14 May 2026).

effectively within supervisory frameworks.[981] This signals a growing recognition that the development of AI-enhanced supervision is not merely a technological question but also one of institutional readiness and governance. Ultimately, how it will form part of SupTech in the future remains is an unanswered question.

What is more certain today is that the 'holy grail' of SupTech is the ability to pull data directly from regulated firms.[982] This pulling of data reduces cost and errors due to human error. The pull approach to data is what this research proposes, but by pulling portfolio data through a live feed rather than through the submission of snapshots of data. This would then give a SupTech application the data needed to make qualitative intervention decisions in the market through a circuit breaker regime.

Whilst mandatory disclosure is about the statement of fact, the obligation on a supervisor, such as ESMA, is one of problem-solving or decision-making. A judgment needs to be made about aggregated data in the market and the extent to which it represents systemic risk. This role of SupTech and its integration with circuit breaker infrastructure is of fundamental difference from RegTech and the reporting process that requires the consideration of AI, and whether the EU AI Act[983] has any implications.

As discussed earlier in this chapter, the EU AI Act establishes a tiered, risk-based framework, prohibiting AI systems that pose unacceptable risks. It imposes strict obligations on high-risk systems, and lighter requirements to limited and minimal-risk systems.[984] Also, targeted simplification measures are currently being introduced through the Digital Omnibus on AI

[981] J. Crisanto, J. Ehrentraud, A. Lawson and A. Restoy, 'Smart Supervision: Sound Capacity Development Approaches for Tech-Savvy Supervisors' (FSI Insights on Policy Implementation No. 70, Financial Stability Institute, November 2025).
[982] H. Allen, 'Regulatory Innovation and Permission to Fail: The Case of Suptech' (2023) 19(2) *NYU Journal of Law & Business* 263.
[983] Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) [2024] OJ L 1689.
[984] See 5.4.5.1.

Regulation proposal.[985] Therefore, the requirement of using AI must be put within an evolving context. The proposal of this research is that regulatory intervention needs to be implemented by way of a circuit breaker. This circuit breaker will have predefined metrics and triggers that are numerical and hence automatically actioned once the parameter is hit. Therefore, AI is not needed in order to initiate the intervention process. Perhaps AI is of use in helping to determine, on an ongoing basis, what the metrics and triggers should be for the circuit breaker regime. Hence, AI is more applicable to the pre-calibration stages of determining pattern recognition or threshold alerts, meaning that it plays a part in trigger assessment but not trigger pulling. The extent to which this remains the position in the future is difficult to say. As AI develops, there may be ways in which it is integrated into the circuit-breaking process. This must be acknowledged. However, such operational assessments are not part of the remit of this research.

Whether or not the EU AI Act applies to SupTech systems and circuit breakers also deserves analysis. Unlike the RegTech context, where the need is for automation and analytics, the SupTech application is somewhat different. It is possible that a SupTech system could be categorised as high-risk under the EU AI Act if it has the potential for significant impact on financial systems and market participants. This is especially true if in the future an AI-enhanced circuit breaker system is created. Under Article 6(2) of the EU AI Act, read together with Annex III, a system is classified as high-risk where it operates as a safety component in the management and operation of critical digital infrastructure. Arguably a SupTech system that is integrated into financial market infrastructure that has the capability of triggering market-wide interventions could approach this threshold. However, it would be a gross overstatement to assert that such a system would automatically satisfy the definition

[985] *Ibid*.

of critical infrastructure under Annex III. At this stage it is not possible to make that connection. Whether or not a particular SupTech or RegTech AI application meets this threshold would depend on the specific characteristics and deployment context of the system in question.

High-risk systems require high levels of transparency, human oversight, and robust challenge to ensure accuracy, as mandated respectively by Articles 13 and 14 of the EU AI Act. In addition, there is also strict risk management obligations imposed by Article 9. It is important to note that classification of AI systems and applications as high-risk is not automatic. Under Article 6, a provider who considers their system not to be high-risk must document and justify that assessment prior to deployment.

These requirements reflect a broader concern that AI systems deployed in financial markets must be subject to rigorous governance frameworks precisely because of their potential systemic impact.[986] However, SupTech is designed to counteract systemic risk and hence a complexity exists in the application of the EU AI Act to both market and supervisory applications. A more in-depth assessment of the interaction between AI governance and financial market supervision is outside the scope of this research, though it represents a significant area for future inquiry.

However, it should be noted that SupTech is a very recent development to enable regulators to extract actionable intelligence from data reported by regulatees via RegTech.[987] These

[986] G. Mazzini and F. Bagni, 'Considerations on the Regulation of AI Systems in the Financial Sector by the AI Act' (2023) 6 *Frontiers in Artificial Intelligence* 1277544. T. Bullman, 'The EU AI Act: A global first in the regulation of artificial intelligence' (2023) 30(11) *Commercial Law Practitioner* 198. M. Veale and F. Zuiderveen Borgesius, 'Demystifying the Draft EU Artificial Intelligence Act' (2021) 22(4) *Computer Law Review International* 97.
[987] Daldaban, *supra* note 13.

platforms are still in their infancy in terms of both the technology and how they fit into the regulatory framework.[988] Therefore, their role in identifying and combatting systemic risk is still in its infancy. ESMA would need to take this into consideration in drafting a future RTS or ITS update to the MiFID or AIFMD regimes by including an appropriate implementation period that allows time for frequency, timing and format changes to be implemented. Nonetheless, advancements in SupTech applications should be instrumental to the implementation of the type of circuit breaker mechanism which is favoured by this chapter.

Combatting systemic risk should be done in real-time through the operation of one or more circuit breakers in financial markets. The identification of systemic risk is about using technology to real-time report, but combatting systemic risk is about using technology to intervene in the market by supporting the trigger process in a circuit breaker regime. Hence, the purpose of SupTech is to match the speed of RegTech reporting with an equal ability of a supervisor to extract appropriate actionable intelligence and intervene in the market through a circuit breaker.[989]

Therefore, in summation, the core components of an effective circuit breaker could be a SupTech-enabled pulling of data; qualitative elements such as short selling, leveraging or rehypothecation flags with associated qualitative assessments; real-time identification and, accordingly, real-time combatting of systemic risk through modified triggers.

5.6. Conclusion

[988] McCarthy, *supra* note 13.
[989] Batista and Ringe, *supra* note 118.

This final chapter started by outlining the argument of this thesis. It then set the scene for that argument by placing it within the regulatory strategy of alignment that ESMA is currently pursuing between EU regulation within the asset management industry via the AIFMD and UCITS regimes. It then addressed the challenge of identifying systemic risk. The identification mechanism addressed in this chapter is that of the mandatory disclosure mechanism of AIFMD. The main focus of the proposals of this chapter is on how the frequency of reporting should be changed to enable AIFMD to achieve its self-stated aim of ensuring financial stability.

There is a significance to the timing of these developments for this research. There is an opportunity now to assess how ESMA can potentially address reporting improvements connected to systemic risk outcomes and the options for how legislative certainty can be achieved. At the time of the submission of the thesis, the Level 1 text of AIFMD II had already been published. Hence, there can be no option for the European Commission to make adjustments to the wording in the Directive. However, any or all of the following could be considered by the European Commission and ESMA: (1) ESMA could include wording in the Level 2 RTS which is due for publication 36 months after publication of the Level 1 text, (2) ESMA could include changes in an updated Annex IV reporting template as part of its draft ITS, which is also due to apply from April 2027, and (3) ESMA could propose further alignment in its Level 2 RTS as part of the current update of the circuit breaker mechanism under the MiFID regime.[990]

In Part 5.2, the chapter outlined the key arguments, focusing on defining the structure proposal and clarifying the boundaries of its scope of application. The argument of this

[990] Should it be necessary, there are subsequent Level 3 Guidelines and FAQs that can be provided after Level 2 measures are completed. However, failing that the European Commission and ESMA could make such changes in Level 1 of AIFMD III as AIFMD II is due for review in 2029.

chapter is that the draft AIFMD II RTS should provide that real-time information through a live portfolio position feed is required to enable real-time identification and combatting of systemic risk through circuit breaker regimes. Draft MiFID II RTS and ITS should reflect the qualitative elements of an updated circuit breaker trigger mechanism based on those live feeds. The triggers for circuit breakers can be updated in existing circuit breaker rules in venues where trading occurs. It is the real-time data on portfolio positions and risks that AIFMD's mandatory disclosure regime can provide to regulators to determine the driver of price movements, how a circuit breaker can be targeted, how triggers can be interpreted from a qualitative perspective, and the assessment of whether the price movement represents panic or fundamental value change. In Part 5.3, the chapter sets the context of regulatory alignment, examining ESMA's approach to harmonising reporting between the AIFMD and UCITS regimes. It emphasised that alignment across the asset management industry is critical for systemic risk to be effectively identified and mitigated.

In Part 5.4, the chapter addressed the identification of systemic risk. It argued that the draft AIFMD II RTS should require real-time information through a live portfolio position feed, enabling regulators to detect emerging systemic risk. It highlighted that it is the real-time data on portfolio positions and risks that allows regulators to determine the driver of price movements, how interventions can be targeted, and whether price changes reflect panic or fundamental value changes. The chapter also discussed the timing of reporting improvements, noting that, with the Level 1 text of AIFMD II already published, adjustments must be implemented through Level 2 measures.

In Part 5.5, the chapter focused on the combatting of systemic risk. This part addressed circuit breakers, the most appropriate mechanism to achieve intervention in the market to combat

systemic risk. It examined the role of circuit breakers as the main intervention mechanism. Further, the practical difficulties and disadvantages of combatting systemic risk through the use of circuit breakers were outlined. Rather than creating new circuit breakers, existing circuit breakers under the MiFID regime could be developed to include qualitative elements. The chapter proposed that the format and timing of real-time reporting could be implemented through the Level 2 RTS and ITS due in 2027, while the creation of qualitative triggers for circuit breakers could be included in the Level 2 RTS due in 2026. These measures would provide regulators with actionable tools to intervene in the market and combat systemic risk effectively. The most realistic options for ESMA to implement the necessary change to give effect to these proposals are: (1) the detail of the live-feed real-time reporting requirement could be contained in the Level 2 draft RTS due in 2027, (2) the format of how this real-time reporting is to be implemented could be contained in Level 2 ITS due by 2027, and (3) the creation of qualitative characteristics to the MiFID circuit breaker trigger mechanism could be included in the Level 2 RTS due in 2026.

CONCLUSION

The issue of hedge funds' systemic risk has been central to the thesis. Since the global financial crisis, various EU regulatory measures applicable to the banking and asset management industries have sought to identify and combat this risk. The introduction of requirements under the AIFMD[991] for the periodic reporting of information is the most prominent example by which regulators have sought to alleviate hedge fund-related systemic risk. Comparable regulatory initiatives across the globe, such as the development of Form PF in the US, have meant that the connections between mandatory disclosure and systemic risk are widely acknowledged. As traced through the preceding chapters of the thesis, this research focused on the EU regulatory measures.

The originality of this research lies in the analysis of the role of information and the use of mandatory disclosure regimes in promoting financial stability. The research has also included an analysis of real-time reporting, achieved through live feeds. Also, the research has addressed the use of information to support the introduction of qualitative elements to existing quantitative circuit breaker trigger metrics. Hence, this research proposed potential changes to existing EU legal frameworks to enhance the efficacy of mandatory disclosure and its ability to identify and combat systemic risk.

Through a doctrinal and socio-legal methodological approach, this thesis revolved around the research questions of: (1) What is the relationship between the hedge fund industry and systemic risk? (2) How effective was AIFMD's mandatory disclosure regime as originally

[991] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, [2011] OJ L174/1.

drafted in providing appropriate and timely data to effectively identify systemic risk within the hedge fund industry? and (3) What supervisory oversight and intervention improvements could be made by ESMA to ensure that systemic risk is more effectively combatted? The first section of this Conclusion will outline each of these arguments. The final section will set out several key observations concerning the findings of this research. Further, it will outline potential future possibilities and directions for research that could effectively reinforce and expand upon the findings of this thesis.

The relationship between the hedge fund industry and systemic risk

Chapter 1 set out the argument that hedge funds have systemic relevance. Using Ireland as a case study, the chapter analysed the nature of hedge funds, the defining characteristics and investment practices of hedge funds, hedge funds' strategies and interconnectedness within financial markets. The cross-jurisdictional dimension of the hedge fund industry and the complexity of its structure and trading activities create significant cause for concern amongst regulators as to the hedge fund industry's contribution to systemic risk and contagion within financial markets. As an unrestrained form of asset management, the hedge fund industry has become known for using complex structuring and investment strategies to earn supernormal returns. The use of leverage, the practice of short selling and the opacity of hedge funds were highlighted as defining characteristics but also key systemic risk concerns within the hedge fund industry. The hedge fund industry is global, but the focus of this thesis has been on the EU hedge fund industry and the extent to which the updated AIFMD may be able to help regulators identify and combat systemic risk. The EU approach is an appropriate case study as it bears similarities to other global regulatory initiatives such as the Form PF mandatory disclosure regulation of hedge funds in the US.

As an unrestrained form of asset management, the hedge fund industry has become known for using complex structuring and investment strategies to deliver absolute returns for investors. These include short-selling and leveraging. These unrestrained speculative investment techniques are used by hedge funds to magnify the rate of return of an investment.[992] Chapter 2 further addressed the issue of systemic risk, specifically through hedge funds' use of leverage. By addressing the origins of systemic risk related to leveraged hedge funds, the chapter assessed the definitional problem surrounding systemic risk, identified the phases in the systemic risk cycle, differentiated between collective industry and individual hedge fund systemic risk, ascertained the role that interconnectedness plays, and highlighted the risk practices that are unique to hedge funds.

The use of leverage has been changing within financial markets. Funding structures have moved away from the traditional bank-based model to the more diverse and accessible market-based model. Chapter 2 examined the relationship between hedge fund leverage forms, focusing on synthetic leveraging options such as repos and derivatives, and systemic risk. The chapter scrutinised how leverage is playing a greater part in modern portfolio structuring and how this has led to portfolio risk being converted into systemic risk. The chapter set out how systemic risk has phases, including accumulation, transmission and crystallisation. The significance of this Chapter 2 analysis has been to clarify the nature of systemic risk in order to identify how hedge funds could be deemed to have the type of systemic relevance identified in Chapter 1.

The Effectiveness of AIFMD's mandatory disclosure regime

[992] P. Breur, 'Measuring Off-Balance Sheet Leverage' (2000) *IMF Working Paper* WP/00/202, 5; available at: https://www.imf.org/external/pubs/ft/wp/2000/wp00202.pdf (date accessed: 10 January 2026).

Chapter 3 focused on the use of information-based disclosure as a regulatory tool for identifying systemic risk. Using the Efficient Market Hypothesis, this chapter analysed the use of information within financial markets and how a disclosure-based reporting regime is a strong option as a mechanism for tackling systemic risk identification. It was highlighted that transparency for its own sake is of no value. Transparency is not an outcome in and of itself. Instead, transparency should be viewed as a support to achieving financial stability. This chapter identified the mandatory disclosure characteristics inherent in existing reporting regimes, such as the EMIR.[993] The chapter then considered what could be the most effective design criteria to promote financial stability.

As emphasised in the thesis, mandatory disclosure regimes can only act as an effective solution if they operate in real-time. Further, the hedge fund reporting regime must be aligned with other mandatory disclosure regimes in other sectors and countries, as systemic risk is a cross-sector global risk. The premise of the research has been that markets and systemic risk are largely based on the availability of information, therefore making an information-based solution the most appropriate regulatory approach.

Chapter 4 focused on the changes to the AIFMD mandatory disclosure regime that have been introduced by the approved Level 1 AIFMD II amendments.[994] This chapter described the scope of AIFMD and the applicability of its Annex IV mandatory disclosure framework to hedge fund activities. The chapter then explained the changes to existing reporting requirements introduced by the Level 1 text of AIFMD II, with a focus on the frequency,

[993] 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, [2014] OJ L173/349.
[994] Directive 2024/927 of 13 March 2024 amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, the provision of depositary and custody services and loan origination by alternative investment funds, ELI: http://data.europa.eu/eli/dir/2024/927/oj.

timing and format of reporting. Therefore, AIFMD II offers realistic and opportune possibilities for further reforms whereby systemic risk could be effectively identified and combatted through AIFMD's mandatory disclosure regime.

As argued throughout this thesis, any identification or combatting of systemic risk must operate in real-time to be effective. The real-time identification of systemic risk is only valuable if the potential exists for a regulator to intervene in the market to neutralise the risk within the same timeframe. Hence, this intervention must also be in real-time. There are existing circuit breaker mechanisms within the EU's MiFID regime, and it was argued that a refined circuit breaker could be used to effectively combat systemic risk in real-time.

The increased harmonisation in the regulation of hedge funds and the UCITS sector reflects the increasing levels of interconnectedness within the asset management industry between hedge funds and UCITS funds. Therefore, the asset management industry as a whole should be providing data in order to make systemic risk assessments. Addressing systemic risk through a mandatory disclosure regime update and a circuit breaker mechanism is key to this research. An information-based problem needs to be addressed by an information-based solution in both the identification and combatting phases.

ESMA's supervisory oversight and intervention

A core tenet of this research has been that real-time mechanisms are the key to identification and combatting of systemic risk. The thesis expresses that real-time, or near real-time, reporting and intervention in the marketplace by a regulator is the only effective solution to the dilemma of systemic risk. In terms of the transfer, accumulation and materialisation

phases of systemic risk, it is the final phase of crystallisation which can cause profound damage within the financial system. Therefore, real-time identification and combatting helps to dampen this potential for destruction at the point of potential crystallisation.

The reporting requirements within a mandatory disclosure regime allow for aggregation of data by the regulator, which is accordingly the basis for actionable intelligence. The aggregation of data facilitates a more comprehensive view of the market and allows for potential systemic risks to be identified. In order to combat systemic risk, a regulator needs to have the real-time data necessary to form actionable intelligence, which is essentially the information that enables a decision about how to combat the imminent systemic threat.

Once actionable intelligence has been generated from reported data, a decision can be made about potential intervention in the market. Circuit breakers have the ability to intervene in real-time to dampen price collapse. Therefore, circuit breakers are a good candidate for combatting systemic risk. However, if they are not promptly used in real-time, then circuit breakers will do little more than merely reduce liquidity in a market where systemic risk has already been triggered.

The key change that has occurred over the past few years to enable real-time reporting and market intervention is the development of RegTech and SupTech solutions. Reporting solutions have been developed for existing frequency, timing and format requirements. Therefore, the technological means already exist for a move to real-time to be made. In the decade since AIFMD reporting was introduced, increased reconciliation automation, AI assistance, the use of algorithms and the integration of systems and data sources necessary to complete reporting have all emerged and grown. The opportunity that currently exists for

ESMA, as part of its mandate to provide Level 2 RTS and ITS, is to build upon the current frequency, timing and format to move AIFMD reporting to being real-time.

Circuit breaker mechanisms could be extended in terms of qualitative aspects of the trigger points. Such intervention could be through enhanced triggers of the existing financial market circuit breaker in the MiFID[995] regime. Circuit breakers essentially facilitate the combatting of systemic risk through a dampening of market activity. This dampening refers to suspension in trading due to perceived irrational panic selling in the market. The thesis advocated for introducing regulatory change in order to more effectively facilitate real-time identification and combatting of systemic risk. These enhancements are argued within the context of the current updating of the AIFMD regime by ESMA, which is due to conclude in mid-2027. These reforms can be enabled by the technological developments associated with RegTech and SupTech. The thesis advances new approaches in the use of RegTech, SupTech and circuit breaker infrastructure. However, the thesis did not proceed to give an exhaustive detailing of the technical workings of new technological applications. The focus of the thesis has ultimately been on how to effectively enhance the existing applicable EU regulatory framework.

Chapter 5 made two proposals regarding how AIFMD's mandatory disclosure regime should be developed by ESMA as part of Level 2 updating under AIFMD II. The first proposal was to move the timing and frequency of reporting under the AIFMD mandatory disclosure regime to real-time through the use of evolving RegTech solutions. This would effectively facilitate the identification of systemic risk. The second proposal was to update the existing MiFID circuit breaker regime based on hedge fund-reported data. This data could provide

[995] 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, [2014] OJ L173/349.

qualitative considerations to be added to existing quantitative trigger metrics. A quantitative factor is a numerical or statistical metric, such as price. A qualitative factor is non-numerical and would assist in giving context to the movement in a numerical metric. A qualitative factor might be that price is falling because of short-selling pressure rather than a sale of a long position. Therefore, regulators' use of evolving SupTech solutions could facilitate more effective combatting of systemic risk.

The timing of AIFMD II developments offers this research a window of opportunity to put forward an argument for how ESMA can address the conceptual disconnect between AIFMD's self-stated goal of identifying and combatting systemic risk and the Annex IV mandatory disclosure regime's ability to deliver those outcomes. As part of ESMA's mandate at Level 2, ESMA could address the frequency, timing and format of reporting in the following ways: (1) ESMA could include wording in the Level 2 RTS concerning real-time reporting which is due for publication 36 months after publication of the Level 1 text, (2) ESMA could include changes in an updated Annex IV reporting template as part of its draft ITS to provide for a live feed instead of a constant real-time submission of data which is also due to apply from April 2027, and (3) ESMA could propose further alignment between AIFMD and UCITS regimes in its Level 2 RTS. ESMA should develop further the quantitative price-based circuit breaker triggers to include qualitative characteristics, such as the reasons behind a price move, as part of the current update of the circuit breaker mechanism under the MiFID regime due in 2026. These proposals are significant to this research because they specify the enhancements that ESMA could make within the AIFMD and MiFID regimes. The enhancements should revolve around the implementation of an information-based solution that enables the real-time identification and combatting of systemic risk.

The first central proposal of the thesis is that, in the context of identifying systemic risk, hedge funds could be required to report data in real-time under the updated AIFMD mandatory disclosure regime. However, due to the vast amounts of data that would be pushed towards regulators and require almost constant aggregation, a more suitable mechanism would be to have a live feed or pull-based mechanism. Through such a pull-based approach, regulators would be able to extract actionable intelligence from the data when deemed necessary. A pull-based approach would avoid the pitfalls in data volume and the potential for inaccurate reporting by market participants.

The second central proposal of the thesis is that, in the context of combatting systemic risk, the existing MiFID circuit breaker regime could be enhanced to cover non-equity markets and use AIFMD reported data sets to provide qualitative elements to existing trigger mechanisms. The current regime is narrowly focused on equity markets and hence is not comprehensive enough to play a major role in the combatting of systemic risk emanating from debt or derivative markets. It is also void of any qualitative trigger elements. Hence, the circuit breaker is not keeping pace with the changing dynamics of the financial markets and their use and connection to systemic risk. However, such triggers for non-equity markets could be developed. Triggers for non-price characteristics could also be developed. This would ensure that existing regulatory mechanisms of market intervention take account of quantitative and qualitative factors.

Final observations

A foremost argument of this thesis is that it is necessary to increase the reporting frequency for hedge funds to be real-time. A transition to real-time reporting can only happen realistically through the creation of a live feed between regulators and the hedge fund portfolio itself. If hedge funds were to report in real-time, the amount of data that would be communicated to the regulator would be too voluminous and extensive. The more effective solution would be to mandate live feeds. The technical workings of this solution are outside of the scope and specialist expertise of this thesis. Nonetheless, the thesis has conveyed that it is an approach which would need to be further researched and developed. Even though the technical workings of a pull-based live feed mechanism are beyond the scope of the thesis, this research has indicated how the law could be reformed to enable mandatory live feeds.

Before any of the proposed mechanisms of this research can be operationalised to identify or combat systemic risk, they must first be created in the form of a mandatory disclosure regulatory regime. A rule or obligation introduced without the means to adhere to it would be illusory. This is the exact principle that this research has sought to establish in analysing whether or not AIFMD's mandatory disclosure regime has the ability to bring about financial stability outcomes. Although it provides a regulatory foundation, the operational solutions do not match the regulatory aim. Hence, there must be a robust regulatory measure put in place first, followed by technological solutions.

It is also worth noting that circuit breakers work on a purely quantitative basis. The thesis puts forward the argument that circuit breaking could be improved by developing more qualitative characteristics that can be integrated into the trigger mechanisms. However,

mandating live feeds and advancing trigger mechanisms are directions and avenues for further research beyond the scope of this thesis.[996]

Finally, to fully implement the proposals of this thesis, further research needs to be undertaken into the alignment of AIFMD and UCITS in terms of reporting, and MiFID II in terms of circuit breaking. AIFMD II aligns both regimes on the format of reporting. However, the regimes are not aligned on technical specifics such as definitions, calculations and methodologies. Most crucially, the algorithms behind the triggers of the circuit breaker regime under MiFID II would need to be developed to cover non-equity markets.

It is clear that there are multiple possibilities for future research in light of contemporary regulatory and technological developments. The developments in RegTech and SupTech technologies are moving in the direction of enabling near-real-time processing of data. Technological developments also allow for moving away from push-based to pull-based options, such as live feeds in a data-saturated financial marketplace. As articulated in the thesis, there must be a shift towards real-time reporting and market intervention. In order to effectively identify or combat systemic risk, regulatory improvements need to ensure this real-time perspective. Such a move to this timeframe is only possible because of these technological developments that are taking place today.

By showing the research's originality and impact in a contemporary context, the thesis seeks to contribute to policy discussions, academic commentary and wider discourse about how modern developments should be matched by regulatory changes. Most significantly, as set

[996] D. Bongaerts, S. D De Luca, and M. Van Achter, 'Circuit breakers and market runs' (2024) 28(6) *Review of Finance* 1953. D. Broeders and J. Prenio, 'Innovative technology in financial supervision (suptech) – the experience of early users' July 2018 FSI Insights on policy implementation No 9.

out in this Conclusion, the thesis has endeavoured to express compelling arguments for how regulatory changes can be achieved.

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