Algorithmic Credit Scoring and Consumer Credit Regulation in the UK: Evaluating the Case for Reform

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Liv Bond

Abstract

This thesis examines the rise of algorithmic credit scoring (ACS) within the UK's consumer credit market and assesses its legal and regulatory implications. Driven by increased amounts of data and developments in artificial intelligence and machine learning, ACS offers the potential to transform consumer creditworthiness assessments by adopting an 'all data is credit data' approach to credit scoring. On the one hand, this innovation has the potential to improve the overall functioning of the consumer credit market, where the increased access to data can allow for increased access to credit and improve the accuracy and efficiency of creditworthiness assessments. On the other hand, ACS presents potential risks that cannot be underestimated, including algorithmic bias, exploitation of vulnerable consumers and the lack of transparency and interpretability in the algorithms used.

This thesis will explore the evolution from traditional credit scoring models towards ACS, proceeding to evaluate the benefits and risks arising from this innovation. The need for regulatory intervention to strike a sufficient balance between harnessing its perceived benefits whilst mitigating its potential risks will be explored, and the sometimes-conflicting goals underlying ACS regulation will be examined. This will lead to our overarching question as to how ACS can be regulated effectively, where it will be explored whether the UK's existing regulatory approach is sufficient or whether an alternative should be explored, drawing comparison to the EU's bolder regulatory approach to artificial intelligence (in general) and ACS (in particular).

Ultimately, this thesis will argue that effective regulation is necessary to strike a sufficient balance between harnessing the benefits of ACS, whilst mitigating the potential risks that may occur and minimising any potential regulatory trade-offs and costs in doing so. In response, proposals for reform will be made to strengthen the UK's regulatory approach to artificial intelligence moving forwards.

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List of Abbreviations

ACS	Algorithmic Credit Scoring
AI	Artificial Intelligence
AI Act	Artificial Intelligence Act 2024
CCA	Consumer Credit Act 1974 / 2006
CDEI	Centre for Data Ethics and Innovation
CMA	Competition and Markets Authority
CONC	Consumer Credit Sourcebook
CRA	Credit Reference Agency
DSIT	Department for Services, Information & Technology
DISP	Dispute Resolution Complaints' Sourcebook
DPA	Data Protection Act 2018
EA	Equality Act 2010
FCA	Financial Conduct Authority
FOS	Financial Ombudsman Service
FSCP	Financial Services Consumer Panel
FSMA	Financial Services and Markets Act 2000 / 2023
GDPR	General Data Protection Regulation
ICO	Information Commissioner's Office
ML	Machine Learning
NYSDFS	New York State Department of Financial Services
OAI	Office for Artificial Intelligence
OFT	Office of Fair Trading
OECD	Organisation for Economic Co-operation and Development
Principles	Principles for Business
PRA	Prudential Regulation Authority
UK GDPR	United Kingdom General Data Protection Regulation
WBG	World Bank Group
xAI	Explainable AI

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Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No. 2) Order 2013/1881

The Financial Services and Markets (FSMA) 2000 (Regulated Activities) Order 2001, SI 2001/544

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Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (United Kingdom General Data Protection Regulation)

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Consolidated Version of the Treaty on European Union [2012] C 326/13

Consolidated Version of the Treaty on the Functioning of the European Union [2012] OJ C326/47

Regulations

Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act) [2024] OJ L2024/1689

Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) [2016] OJ L119/1

Statement of Copyright

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Introduction

Credit is essential for the functioning of the economy, underpinning both an individual's financial wellbeing and the progression of social mobility.[1] Access to credit empowers individuals to achieve important goals in life such as the purchase of a car or a mortgage, pursuing further education, or starting a business.[2] Without access to credit, these opportunities may become difficult to attain, placing significant barriers upon an individual's general progression in life.[3] Beyond providing financial freedom and security, credit also serves as a tool for financial resilience, offering a flexible way for individuals to spread costs and manage their personal finances more effectively.[4] Consequently, credit scoring is an important process, as the numerical score allocated to an individual directly determines their access to credit.[5]

Despite this importance, traditional credit models often exclude individuals with limited or no credit history from accessing credit, limiting their financial opportunities. Known as thin-file or no-file borrowers, these individuals often face exclusion as lenders have limited access to traditional financial and credit data only, resulting in either scoring poorly or being deemed as unscorable altogether.[6] To address this limitation, new scoring models, grouped under the category of algorithmic credit scoring (ACS), have evolved from traditional credit scoring models, paving the way for an 'all data is credit data' approach and marking a new era for creditworthiness assessments.[7] Driven by advancements in artificial intelligence (AI) and

[1] Phoebe Ward and Carol McNaughton Nicholls, 'Financial Services Consumer Panel (FSCP): research report on early-stage consumer credit journeys' (FSCP and Thinks Insight 2022) 5.

[2] Mikella Hurley and Julius Adebayo, 'Credit scoring in the era of big data' (2016) 18 Yale JL & Tech 148.

[3] Ibid, 148-149.

[4] Carol McNaughton Nicholls, Allie Jennings and Anna Noren, 'The Future of Credit' (Thinks Insight 2023) 10; and Brigid Francis-Devine, House of Commons Library, 'Research Briefing: Household debt: statistics and impact on economy' (29 May 2024) No. 7584, 30 <https://researchbriefings.files.parliament.uk/documents/CBP-7584/CBP-7584.pdf> accessed 27 August 2024.

[5] Tamara Altman, 'When Were Credit Scores Invented? A Brief Look at History.' (*OppU*, 27 July 2023) <https://www.opploans.com/oppu/building-credit/a-brief-history-of-credit-scores/> accessed 1 May 2024.

[6] Nikita Aggarwal, 'Law and Autonomous Systems Series: Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (*Oxford Business Law Blog*, 1 November 2018) <https://blogs.law.ox.ac.uk/business-law-blog/blog/2018/11/law-and-autonomous-systems-series-algorithmic-credit-scoring-and> accessed 14 May 2024.

[7] Quentin Hardy, 'Just the Facts. Yes, All of Them' *The New York Times* (New York, 25 March 2012) <https://archive.nytimes.com/query.nytimes.com/gst/fullpage-9A0CE7DD153CF936A15750C0A9649D8B63.html>accessed 30 August 2024; and Emily Rosamond, '"All Data is Credit Data": Reputation, Regulation and Character in the Entrepreneurial Imaginary' (2016) 25(2) Paragrana 112, 113.

machine learning (ML) and increasing quantities of data, ACS uses automated scoring models to assess consumer creditworthiness. No longer restricted to hard financial data, ACS uses alternative data, such as mobile phone bills and rent payments, to draw conclusions on a borrower's creditworthiness.[8] Through the use of and access to alternative data, ACS provides the opportunity for increased credit access, which in turn can potentially widen financial inclusion, along with increased efficiency and accuracy in creditworthiness assessments. This is on the basis that the use of alternative data can offer a more comprehensive overview of an individual's credit score, which provides for a more detailed understanding of a borrower's financial health to lenders.

However, the rise of ACS also introduces legal and regulatory challenges, such as algorithmic bias, the exploitation of vulnerable consumers and the lack of transparency. To address these challenges, it is argued that ACS requires effective regulation, where a sufficient balance must be struck between allowing its benefits to be harnessed, without failing to address its risks. The EU have taken the leading step in establishing effective regulation for ACS by strengthening existing frameworks through its ambitious Artificial Intelligence Act 2024 (AI Act).[9] This legislative approach initially prompted this thesis by sparking debate across the legal sphere on whether ACS should fall within the 'high-risk' category, where it requires increased regulatory scrutiny to ensure the protection of health, safety, and the fundamental rights of borrowers.[10] This raises debate surrounding the effectiveness of the UK's regulatory approach to ACS, which currently lacks the additional layer of AI regulation adopted by the EU, prompting discussion as to whether increased regulation or legislation is needed where the UK could follow in the EU's footsteps.

To engage with this debate, the objective of this thesis is to analyse how the UK should respond and regulate ACS moving forwards to ensure the efficient and fair functioning of its consumer credit markets. The effectiveness of the UK's regulatory approach to ACS will be discussed in the context of the UK's financial regulatory framework for consumer credit, as built upon by

[8] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

[9] Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act) (AI Act) [2024] OJ L2024/1689.

[10] Ibid, recital 1; and European Commission, 'AI Act' <https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai> accessed 14 August 2024.

its 'pro-innovation' approach to AI.[11] To be effective, regulation must strike a sufficient balance between harnessing the benefits of ACS and mitigating its risks. To achieve this aim, the UK's existing legal framework for consumer credit regulation will be analysed, whilst discussing whether new legislation and/or regulation should be introduced. In this context, an effective regulatory regime is one where legislative and/or regulatory measures address the risks arising from ACS, whilst harnessing its potential benefits. In response, proposals for reform will be discussed and proposals made, seeking introduction of both legislation and increased regulation to ensure that ACS can be effectively managed in a way that primarily benefits the consumer credit market, widening access to the financial system.

This thesis will adopt both comparative and doctrinal methodologies, where analysis will be divided into five chapters. The first chapter will provide a foundational understanding of how credit scoring and consumer creditworthiness are assessed in practice, which is necessary to facilitate discussion on how traditional credit scoring models have evolved towards ACS, offering the potential to improve consumer creditworthiness assessments. The second chapter will build upon this discussion by assessing the legal implications arising from the use of ACS, where a benefit-risk approach will be adopted. The need for regulatory intervention will be introduced, where it will be argued that ACS presents itself as a 'double-edged sword':[12] offering both substantial benefits and risks which must be balanced through effective regulation. Building upon the benefit-risk analysis, the third chapter will discuss the relationship between ACS and the normative goals of allocative efficiency and distributional fairness, examining potential conflicts between these goals. It will then discuss how ACS brings specific risks not necessarily included within existing regulation, including consumer trust, privacy and innovation. This chapter will prepare for the remaining chapters to analyse whether the UK's existing regulatory framework is sufficient to address ACS in its current form, or whether reform is necessary.

The fourth chapter will establish the groundwork for our final chapter by outlining the UK's existing framework for consumer credit as applicable to ACS, before discussing how this framework has been built upon by the UK's approach to AI. To allow discussion into an alternative, legislative approach to the regulation of ACS, the key elements of the EU's AI Act

[11] Department for Science, Innovation & Technology (DSIT) and Office for Artificial Intelligence (OAI), *A pro-innovation approach to AI regulation* (CP 815, 2023).
[12] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

will be outlined where relevant, focusing on the EU's 'high-risk'[13] categorisation for ACS to determine whether the UK should follow in the EU's footsteps. Once the groundwork has been established, the final chapter will assess whether the UK's regulatory approach to ACS provides effective regulation, by assessing whether this regulatory approach is sufficient to harness the benefits of ACS, whilst mitigating the risks and minimising potential trade-offs and weighing up the potential costs to consumer privacy and innovation.

Ultimately, it will be concluded that the UK's regulatory approach to ACS is limited and requires significant reform. Although the UK has adopted a non-binding statutory framework, the absence of mandatory, enforceable legislation may present challenges. In contrast, the EU's regulatory approach to ACS is far stricter and more proactive. However, whilst appearing useful on the surface, the EU's approach may potentially limit innovation due to its rigid nature. Therefore, this thesis will conclude that to provide effective regulation for ACS, a middle ground must be found, striking a balance between the regulatory approaches of both the UK and the EU. In line with this recommendation, it will be proposed that a robust, yet flexible regulatory approach should be adopted in the UK. This approach should combine key features and strengths of both the current UK and EU approaches to the regulation of ACS, ultimately ensuring that the potential risks associated with ACS are mitigated but without forsaking the benefits of this technology.

[13] AI Act (n 9) recital 1.

Chapter 1: The Evolution of Credit Scoring

This chapter aims to provide a foundational understanding as to how consumer creditworthiness is assessed, setting the stage for discussion into how traditional credit scoring methods have evolved towards ACS. By exploring the concept of creditworthiness and the processes used to evaluate it, this will offer an introduction into how ACS has evolved to offer a solution to the limitations of traditional credit scoring models. To structure this chapter, an overview of credit scoring and the assessment of consumer creditworthiness will be outlined, emphasising the importance of assessing both credit risk and affordability. Following this, discussion will focus on the evolution of credit scoring, exploring how increasing quantities of data and advancements in ML technology have given rise to ACS. Overall, this chapter serves the function of laying the groundwork for understanding ACS as both a beneficial opportunity and a challenge, which will be explored in subsequent chapters.

1.1 Credit Scoring and Creditworthiness

Credit scoring can be defined as statistical analysis by lenders, with the intention of assessing the creditworthiness of a prospective borrower.[14] A creditworthiness assessment amounts to an evaluation of both the credit risk to the lender, namely estimating the probability of default or delinquency by the borrower,[15] and the affordability of the credit to the borrower in their individual circumstances.[16] This statistical analysis of creditworthiness generates a credit score: a numerical score which allows an individual or business to access products such as mortgages, credit cards or loans.[17]

In the UK, credit scoring involves both Credit Reference Agencies (CRAs) and lenders.[18] To oversee the regulation of consumer credit, this responsibility falls to the UK's consumer credit regulator, the Financial Conduct Authority (FCA).[19] The UK has three main CRAs: Equifax,

[14] Thomas Brock, 'What Is Credit Scoring? Purpose, Factors, and Role in Lending' (*Investopedia*, 23 March 2023) <https://www.investopedia.com/terms/c/credit_scoring.asp> accessed 4 April 2024.
[15] Terisa Roberts et al, 'Credit Scoring Approaches Guidelines' (World Bank Group (WBG) and International Committee on Credit Reporting 2019) 3.
[16] Nikita Aggarwal, 'The Norms of Algorithmic Credit Scoring' (2021) 80(1) Cambridge Law Journal 42, 49.
[17] Brock (n 14).
[18] Information Commissioner's Office (ICO), 'Credit' <https://ico.org.uk/for-the-public/credit/> accessed 30 August 2024.
[19] Ibid.

Experian and TransUnion.[20] The CRAs each collect data on individuals, which is then used to create a credit report: a factual record containing information that provides a reflection of an individual's credit history.[21] From this data, CRAs generate a credit score, which is used to provide individuals with an idea of how their credit history may be perceived by lenders.[22] An individual's score may vary from one CRA to another, typically ranging on a numerical scale from scores of 0-999 which reflects a range from 'Poor' to 'Excellent'.[23] The score awarded changes over time, to ensure that an individual's credit score remains an up-to-date and accurately reflects their financial circumstances. Typically, the higher the borrower's credit score, the more favourable the interest rate and terms offered to them by lenders.[24]

Following this process, CRAs provide the data collected and its own creditworthiness assessment to lenders.[25] This allows lenders to undertake their *own* creditworthiness assessment, with the purpose of determining whether lenders should extend or deny credit to a borrower.[26] Overall, this data is used to paint a broader picture of the borrower's financial health,[27] aiding both to validate the identity of the individual and to demonstrate their overall creditworthiness to lenders.[28]

1.2 A 'Reasonable' Creditworthiness Assessment

To provide credit to a borrower, a 'reasonable' creditworthiness assessment must be undertaken by the lender before a credit agreement can be entered into.[29] This expectation is placed on lenders by the FCA under the Consumer Credit Sourcebook (CONC).[30] To meet this expectation, a lender must base their assessment on 'sufficient' information which it is aware

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[20] Ibid.

[21] TransUnion, 'Credit Score Frequently Asked Questions' <https://www.transunion.co.uk/consumer/credit-score-faq#about-your-cred-report-1> accessed 30 August 2024.

[22] Ibid.

[23] Gary Hemming, 'Credit Score: Meaning, Range, Factors, Improving It' (*ABC Finance*) <https://abcfinance.co.uk/credit/> accessed 30 August 2024.

[24] Ibid.

[25] Dan Base and Ellie Austin-Williams, 'How does credit scoring work?' (*Money*, 22 October 2021) <https://www.money.co.uk/guides/how-does-credit-scoring-work> accessed 30 August 2024.

[26] Brock (n 14).

[27] Equifax, 'How Are Credit Scores Calculated?' <https://www.equifax.com/personal/education/credit/score/articles/-/learn/how-is-credit-score-calculated/> accessed 25 April 2024.

[28] Experian, 'Making the Invisible Visible: Exploring the power of new data sources' (2018) 6.

[29] FCA, 'Consumer Credit Sourcebook' ('CONC') (FCA Release 39, August 2024) 5.2A; and The Financial Services and Markets 2000 (Regulated Activities) Order 2001, SI 2001/544, art 60B.

[30] The role of the FCA and consumer credit regulation will be discussed further in chapter 4.

of at the time, obtained from a CRA where necessary, or from the individual themselves where appropriate.[31] Once obtained, this information must be proportionate in relation to the individual circumstances of a borrower.[32] Overall, to undertake a 'reasonable' assessment of creditworthiness, lenders must use the information obtained to strike a balance between both the credit risk for the lender *and* the affordability of the loan for the borrower.[33] The requirements of credit risk and affordability will be explored further below.

1.2.1 *Credit Risk*

On the one hand, the assessment of credit risk evaluates the risk a borrower poses to a lender, by considering how likely an individual is to default upon their debt repayments and obligations.[34] To assess credit risk in practice, CRAs provide lenders with a range of information about the borrower, with the intention of allowing the lender to assess whether they will offer the borrower credit or not.[35] For example, CRAs evaluate a borrower's previous credit history, including information such as low or excessive credit use and how they have maintained previous accounts and payments, along with factors such as address changes, electoral roll registration, county court judgments, history of bankruptcy and past insolvency issues.[36] It is understood that the factors and information used contributes either positively or negatively to an individual's credit score.[37] However, the models used to determine credit scores are proprietary algorithms, meaning that lenders and CRAs keep the *exact* use of the information in the scoring process private as a trade secret.[38] Consequently, it is necessary to mandate credit scoring, to ensure that the consumer credit market functions efficiently for both parties and to ensure adequate consumer protection is maintained.

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[31] Ibid, 5.2A.7.

[32] Ibid, 5.2A.20. See also FCA, 'Understanding consumer credit – Creditworthiness and affordability: common misunderstandings' (2015) 4.

[33] Ibid, 5.2A.10. See also FCA, 'Policy Statement PS18/19: Assessing creditworthiness in consumer credit – Feedback on CP17/27 and final rules and guidance' (2018) 11.

[34] Ibid, 5.2A.10(1); and Rajeev Dhir, 'Creditworthiness: How to Check and Improve It' (*Investopedia*, 10 August 2023) <https://www.investopedia.com/terms/c/credit-worthiness.asp#toc-what-is-creditworthiness> accessed 4 April 2024.

[35] ICO, 'Credit' (n 18).

[36] Ibid.

[37] Lloyds Bank, 'Credit Scoring: A guide to how it works' (2020) 2.

[38] Nydia Remolina, 'The Role of Financial Regulators in the Governance of Algorithmic Credit Scoring' (2022) SMU Centre for AI and Data Governance Working Paper 2/2022, 8 <https://ssrn.com/abstract=4057986> accessed 1 May 2024.

Furthermore, assessing credit risk in credit scoring is essential for lenders to ensure the quality of bank loans is maintained, as lenders are able to evaluate any current and expected risks that may arise from customers not being able to repay and defaulting on payments.[39] This is an important element of the scoring process as the majority of lenders have a strong commercial incentive when assessing potential credit risk, including the probability of default,[40] as lending only remains profitable if a significant proportion of borrowers pay back their loans.[41] Therefore, the evaluation of credit and credit risk is crucial for lenders, as it allows lenders to evaluate whether credit should be offered to the borrower based on their overall financial position.

1.2.2 *Affordability*

On the other hand, whilst the borrower's ability to repay is crucial for maintaining the lending relationship, assessing their affordability risk is also important to determine the borrower's ability to do so affordably and without significant detriment to their broader financial situation.[42] Despite this necessity, when evaluating creditworthiness, there is a much lesser incentive for lenders to assess affordability, which can have a negative impact on a borrower's broader financial position, in particular where that borrower would remain profitable for the lender.[43]

To counteract this, by requiring lenders to assess affordability, the FCA limits the ability of lenders to exploit both the cognitive and behavioural weaknesses of borrowers who are lacking financial literacy or resilience.[44] To be financially illiterate, an individual would lack the confidence and capability of manging their own money, placing these individuals in a vulnerable position subject to exploitation by lenders.[45] Individuals with low financial

[39] Hussein Abdou and John Pointon, 'Credit Scoring, Statistical Techniques and Evaluation Criteria: A Review of the Literature' (2011) 18(2-3) Intelligent Systems in Accounting, Finance & Management 59, 60.
[40] FCA, 'Policy Statement PS18/19' (n 33) 4.
[41] Ibid, 7.
[42] Ibid, 4; and FCA, 'CONC' (n 29) 5.2A.10(2).
[43] Ibid, 4.
[44] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6); and Oren Bar-Gill, 'Seduction by Contract: Law, Economics and Psychology in Consumer Markets – Introduction' (OUP 2012) NYU Law & Economics Research Paper Series Working Paper No. 12-33 <https://ssrn.com/abstract=2153775> accessed 25 April 2024.
[45] James Lawrence, 'Is it up to the financial services sector to bridge the UK's financial literacy gap?' (*Raconteur*, 19 June 2023) <https://www.raconteur.net/responsible-business/financial-services-sector-bridge-financial-literacy-gap> accessed 8 June 2024.

resilience (described by the FCA as individuals of a lower income who have 'limited capacity to withstand financial shocks')[46] risk facing similarly precarious situations. These include the temporary loss of their main source of income, existing financial difficulty, and struggles to keep up with current bills.[47] As a result, borrowers with low financial literacy and resilience tend to have increased vulnerability and are likely to be of a low income.[48] This vulnerability may result in individuals being targeted by lenders looking to sell unaffordable credit products and rates, offering this as a way to recover from difficult financial situations, such as arrears in their bills during the ongoing cost-of-living crisis.[49] Limiting the potential for exploitation of these individuals by lenders is particularly important, as this could be highly detrimental not just to those individuals, but to society at large. For example, significant consequences could follow throughout the lives of such individuals, such as becoming indebted and losing their home if defaulting on mortgage payments or declaring bankruptcy.[50] Therefore, to limit this exploitative behaviour by lenders, the FCA requires lenders to assess affordability in addition to credit risk to determine how affordable the credit would be in the borrower's individual circumstances.[51]

To assess affordability in practice, factors such as an individual's income and expenses and debt-to-income ratio are considered to assess what a borrower could reasonably afford to repay.[52] This approach taken by the FCA for balancing the assessment of credit risk *and* affordability aims to strike a balance between minimising the risk of financial distress amongst borrowers, whilst avoiding being too prescriptive, which could inadvertently result in unintended consequences for the cost and availability of credit.[53] By assessing affordability,

[46] FCA, 'Financial Lives 2022 survey: insights on vulnerability and financial resilience relevant to the rising cost of living' (Updated 26 July 2023) <https://www.fca.org.uk/data/financial-lives-2022-early-survey-insights-vulnerability-financial-resilience#lf-chapter-id-low-financial-resilience> accessed 6 June 2024.
[47] Ibid.
[48] John Y. Campbell et al, 'Consumer Financial Protection' (2011) 25(1) Journal of Economic Perspectives 91, 95.
[49] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).
[50] Sonia Rach, 'Three quarters fall below financial literacy benchmark' (*Financial Times Adviser*, 28 July 2023) <https://www.ftadviser.com/your-industry/2023/07/28/three-quarters-fall-below-financial-literacy-benchmark/> accessed 8 June 2024.
[51] FCA, 'CONC' (n 29) 5.2A.5(2).
[52] PepperMoney, 'What is loan affordability and how does it work?' (16 May 2023) <https://www.pepper.money/blog/what-is-loan-affordability-and-how-does-it-work/> accessed 7 May 2024; and Lloyds Bank, 'What is a credit score and how does it work?' <https://www.lloydsbank.com/understanding-credit/what-is-a-credit-score-how-does-a-credit-score-work.html> accessed 15 May 2024.
[53] FCA, 'Policy Statement PS18/19' (n 33) 4-5.

this crucial element of the assessment aims to increase reasonable access to credit,[54] whilst mitigating the potential for over-indebtedness for the borrower.[55]

Overall, requiring lenders to assess both credit risk *and* affordability is advantageous, as this provides a consistent and efficient process for lenders to assess the creditworthiness of a borrower.[56] As this chapter aims to provide a foundational understanding of how creditworthiness is assessed in credit scoring, discussion will now move towards the models and methods involved in generating a credit score.

1.3 The Evolution of Credit Scoring

Over time, the methods of assessing creditworthiness have evolved significantly.[57] This evolution will be explored below, where an overview will be provided of the early history of credit scoring. The purpose of this overview is to examine how traditional credit scoring models have evolved towards ACS (and how ACS differs from them).

1.3.1 *The Early History of Credit Scoring*

Prior to credit scoring, commercial credit reporting was used with the purpose of allowing merchants, as lenders, to assess the creditworthiness of their prospective borrowers.[58] This practice originated in the US, starting with the Mercantile Agency: a commercial credit reporting agency founded in 1841 to establish an organised effort to collect information about lenders and borrowers.[59] To do so, correspondents were used, who would supply lenders with detailed information about the prospective borrower, such as their ethnicity, credit history, age and marital status.[60] The information collected would be entered into a single ledger in New

[54] Nikhil Rathi, Chief Executive of the FCA, 'It's time for an Enlightenment on financial inclusion' (Speech at PwC Glasgow for the Scottish Financial Enterprise: Extending Financial Inclusion event, 29 September 2023) <https://www.fca.org.uk/news/speeches/time-enlightenment-financial-inclusion> accessed 8 June 2024.

[55] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6); and Equifax, 'Affordability is more than income verification' (July 2023) <https://www.experian.co.uk/blogs/latest-thinking/automated-credit-decisions/affordability-is-more-than-income-verification/> accessed 7 May 2024.

[56] Roberts T et al, 'Credit Scoring Approaches Guidelines' (n 15) 3; and Brock (n 14).

[57] Ibid, 1.

[58] Trina Paul, 'When did credit scores start? A brief look at the long history behind credit reporting' *CNBC Select* (New Jersey, 31 January 2023) <https://cnb.cx/3xVS4pt> accessed 1 May 2024.

[59] Ibid; and James H. Madison, 'The Evolution of Commercial Credit Reporting Agencies in Nineteenth-Century America' (1974) 48(2) The Business History Review 164.

[60] Ibid.

York, where the correspondents would then evaluate an individual's creditworthiness subjectively, based on factors such as moral character, gender and race.[61]

This subjectivity was problematic, as consequences arose from the reinforcement of social hierarchies and stereotypes, where speculation from rumours resulted in inaccuracies in the information obtained and consequent discrimination.[62] For example, the reporters of this credit information tended to be exclusively white, middle-class males, who would compile reports based upon gossip surrounding race, class, sexual orientation and even housekeeping.[63] This resulted in a clear demand for a simplified, *objective* evaluation of creditworthiness, where statistical analysis could be used to develop a standardised credit scoring algorithm which would allow credit to be accessed more fairly and widely amongst individuals.[64]

1.3.2 *An Objective Evaluation of Credit*

In response to this demand, mathematician Earl Isaac and engineer Bill Fair created the FICO model in the US in 1956: a credit scoring model designed with the intention of establishing objective and fair practices through standardised lending for borrowers.[65] This model provided an objective evaluation of creditworthiness, where an individual could either be accepted or rejected for credit based on information such as their business demographics, insurance and utilities.[66] The FICO model revolutionised credit scoring at the time, setting the precedent for the data-driven evaluation found in credit scoring models today.[67] Additionally, the FICO score was introduced in 1989: a three-digit credit score which became the industry standard in the US.[68]

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[61] Ibid.

[62] Sean Trainor, 'The Long, Twisted History of Your Credit Score' *Time* (New York, 22 July 2015) <https://time.com/3961676/history-credit-scores/> accessed 30 August 2024; and Capital One, 'When were credit cards invented?' (24 August 2023) <https://www.capitalone.com/learn-grow/money-management/when-were-credit-cards-invented/> accessed 30 August 2024.

[63] Rachel O'Dwyer, 'Algorithms are making the same mistakes assessing credit scores that humans did a century ago' *Quartz* (New York, 2018) <https://qz.com/1276781/algorithms-are-making-the-same-mistakes-assessing-credit-scores-that-humans-did-a-century-ago> accessed 16 May 2024.

[64] Trainor (n 62).

[65] FICO, 'FICO History' <https://www.fico.com/en/history> accessed 1 May 2024; and Rob Kaufman, 'The History of the FICO Score' (*myFICO*, 21 August 2018) <https://www.myfico.com/credit-education/blog/history-of-the-fico-score> accessed 30 August 2024.

[66] Roberts T et al, 'Credit Scoring Approaches Guidelines' (n 15) 1.

[67] Ibid.

[68] Trainor (n 62).

Although the UK did not adopt a universal credit scoring system like the US, meaning that an individual's credit score may vary between CRAs, understanding the global evolution of credit scoring is important to appreciate how this has shaped the modern scoring models used today. Ultimately, the purpose of credit scoring remains the same: to objectively evaluate an individual's creditworthiness using data-driven scoring models. Following this overview of the early history of credit scoring, the evolution in the UK towards an objective evaluation of credit through traditional credit scoring models will now be explored.

1.3.3 *Traditional Credit Scoring*

In traditional credit scoring models, conclusions on the creditworthiness of borrowers are drawn mainly from visible patterns of past credit performance and transaction data from their financial accounts.[69] For example, logistic regression models are often used in credit scoring, which interpret a set criterion of data to produce an outcome, generating a credit score based on only the financial and credit data provided by the CRAs.[70] This traditional approach is reflective of the statistical correlation between a borrower's credit history and likely credit risk and affordability, where lenders' access to non-financial and non-credit data about borrowers is traditionally very limited.[71] Traditionally, this data includes credit data, such as the length of an individual's credit history, past arrears, and their current debt and credit.[72]

However, data has become increasingly digitalised, resulting in rapid growth in data sets from increased digital footprints of both individuals and businesses.[73] This raises an issue for traditional credit scoring models, where the logistic regression models used were initially designed to work with far smaller data sets than what we have today.[74] Because of this, traditional credit scoring models struggle to keep up with the volume and variety of alternative data available, in terms of both limited computing power and data-processing technology.[75]

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[69] David J. Hand and Saul D. Jacka, *Statistics in Finance* (Arnold Applications in Finance, Wiley-Blackwell 1998) 106.

[70] Equifax, 'Explainable AI for Credit Scoring' <https://www.equifax.com.au/knowledge-hub/risk-solutions/explainable-ai-credit-scoring> accessed 7 May 2024.

[71] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

[72] Roberts T et al, 'Credit Scoring Approaches Guidelines' (n 15) 9.

[73] Ibid, 9.

[74] Rosamond (n 7) 116.

[75] Phindulo Makhado, 'The Limitations of Traditional Credit Scoring Systems' (*Medium*, 5 November 2023) <https://medium.com/@phindulo60/the-limitations-of-traditional-credit-scoring-systems-e92833fdfa8a> accessed 8 May 2024.

Therefore, whilst traditional credit scoring models have demonstrated consistent positive performance for over fifty years, the increased access to data and increased computing power calls for a more efficient and accurate process to assess the broader data-set available.[76] As a result, the methods of assessing credit have evolved significantly in recent years to keep up with the increased data available, moving from traditional credit scoring models towards ACS.[77]

1.4 The Rise of Algorithmic Credit Scoring

Evolving from traditional credit scoring models, ACS uses automated scoring models to model and predict an individual's creditworthiness through AI and ML technology, reflecting a more data-driven approach to credit scoring.[78] This has been driven primarily by innovation from technological developments and increased access to data; coupled with demand for improved efficiency and overall economic growth.[79] To frame this discussion on the evolution of traditional models towards ACS, an insight will be briefly provided into how AI and ML technology serves to analyse consumer creditworthiness more efficiently and accurately.

1.4.1 *Artificial Intelligence and Machine Learning*

To provide context, AI has developed significantly in recent years, with increased technological developments and computational power now allowing machines and computers to simulate the problem-solving capacity and intelligence of humans.[80] Through the use of algorithms, AI is able to learn and make decisions independently,[81] positioning the use of AI as an irreplaceable aspect of future technology and business.[82]

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[76] Zhentian Qiu, 'Classify Neural Networks in Credit Scoring area based on the Financial Ratios' (MSc Mathematics and Finance thesis, Imperial College of London 2018) 9; and William H. Beaver, 'Financial ratios as predictors of failure' (1966) 4 Journal of Accounting Research 71.

[77] Roberts T et al, 'Credit Scoring Approaches Guidelines' (n 15) 1.

[78] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6); and Phoebe Ward and Carol McNaughton Nicholls, 'Financial Services firms' personal data use – is this leading to bias and detriment for consumers with protected characteristics?' (FSCP and Thinks Insight 2023) 8.

[79] Roberts T et al, 'Credit Scoring Approaches Guidelines' (n 15) 1.

[80] IBM, 'What is artificial intelligence (AI)?' <https://www.ibm.com/topics/artificial-intelligence> accessed 21 May 2024.

[81] Ward and McNaughton Nicholls, 'Financial Services firms' personal data use' (n 78) 9; and Robert Smith, 'The Key Differences Between Rule-Based AI And Machine Learning' (*Becoming Human: AI*, 14 July 2020) <https://becominghuman.ai/the-key-differences-between-rule-based-ai-and-machine-learning-8792e545e6> accessed 30 April 2024.

[82] Mark Cankett and Barry Liddy, 'Risk management in the new era of AI regulation' (*Deloitte*, 12 July 2022) <https://www.deloitte.com/uk/en/services/audit/blogs/2022/the-new-era-of-ai-regulation.html> accessed 11 August 2024.

ML arises as a branch of AI, where this technology uses both algorithms and data together to enable AI to imitate human learning, optimised to improve its accuracy over time.[83] To do so, ML algorithms are assigned a task and provided with large quantities of data, which are used as examples of how to best achieve the task assigned or achieve the output desired.[84] The purpose of ML technology is to identify patterns and correlations in the data provided, with the intention of speeding up and optimising the process involved to complete an assigned task.

1.4.2 *The Use of Machine Learning in Algorithmic Credit Scoring*

Through these recent technological and computational developments, ACS has arisen, which allows a broader, more in-depth analysis of the increased data available. To respond to these developments and to address the limitations of traditional credit scoring models, Aggarwal outlines two key dimensions of change in ACS that must be explored.[85]

The first dimension relates to the use of both a broader variety and volume of data available through ACS, where an 'all data is credit data' approach to credit scoring is adopted to use this increased data.[86] This means that alternative data is used in ACS, which involves using both non-credit, financial data and non-credit, non-financial data, with the aim of providing a more comprehensive assessment of both credit risk and affordability. The second dimension is the increased complexity and sophistication of credit scoring models and techniques in analysing the data available, which can be attributed to substantial developments in technological and computational power.[87] Arising from these developments, the algorithms used in credit scoring are now able to identify and analyse a larger volume and wider variety of alternative data within creditworthiness assessments.[88] Through the use and processing of alternative data, ACS aims to provide increased accuracy and efficiency in creditworthiness assessments by offering a deeper, more comprehensive insight into a borrower's overall financial health.[89]

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[83] IBM, 'What is machine learning (ML)?' <https://www.ibm.com/topics/machine-learning> accessed 21 May 2024.

[84] For more detail on ML algorithms, please see Alan Bundy et al, 'Explainable AI: the basics – Policy Briefing' (The Royal Society 2019) 6.

[85] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

[86] Ibid; and Hardy (n 7).

[87] Sahiba Chopra, 'Current Regulatory Challenges in Consumer Credit Scoring Using Alternative Data-Driven Methodologies' (2021) 23(3) Vanderbilt Journal of Entertainment & Technology Law 625, 634.

[88] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

[89] Ibid.

Together, these key dimensions overlap, allowing ACS to classify and identify patterns and correlations in the financial behaviour of individuals,[90] with the intention of producing a more well-rounded, holistic credit score.[91]

1.5 Conclusion

In conclusion, this chapter has explored how credit scoring and creditworthiness are assessed, highlighting the importance of evaluating both credit risk and affordability to determine the suitability of extending credit in a borrower's individual circumstances. Two key dimensions of change arising in ACS have been identified: the increased accessibility and use of alternative data, and the increased complexity and sophistication of credit scoring models as computational power has increased over time.[92] This illustrates the developments of ACS, which provides the benefit of seeking to address and remedy the limitations of traditional credit scoring models, with the purpose of supporting the overall functioning of the consumer credit market.

However, whilst technological developments and increased computational power can streamline processes and optimise the outcomes available through credit scoring, the use of ACS requires closer examination to ensure that a sufficient balance can be struck between these potential benefits of ACS and the challenges that follow. With this foundational understanding of ACS, the following chapter will build upon this discussion, where the potential benefits and risks associated with the use of ACS will be explored. The trade-offs between the benefits and risks will serve as a crucial point for the need for regulatory intervention, which will be explored further in subsequent chapters.

[90] Holli Sargeant, 'Algorithmic decision-making in financial services: economic and normative outcomes in consumer credit' (2023) 3 AI and Ethics 1295, 1296-1297.

[91] Michele Tucci, 'Why is the traditional credit rating system losing steam?' (*CredoLab*, 5 November 2021) <https://www.credolab.com/blog/why-is-the-traditional-credit-rating-system-losing-steam> accessed 1 November 2023.

[92] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

Chapter 2: Balancing the Benefits and Risks of Algorithmic Credit Scoring

The previous chapter highlighted the evolution of ACS from traditional credit scoring models, emphasising two overlapping key dimensions of change: the increased accessibility and use of alternative data, and the growing complexity and sophistication of credit scoring models through increased technological and computational power.[93] Whilst these advancements offer significant benefit by addressing the limitations of traditional credit scoring models, the risks that follow must not be underestimated. The purpose of this chapter is to explore how ACS presents itself as a 'double-edged sword': offering both significant benefit *and* significant risk hand in hand.[94] Therefore, this chapter aims to explore the potential benefits of ACS, examining how these benefits can support the overall functioning of the consumer credit market, whilst also acknowledging that these benefits must be balanced against the potential risks and trade-offs that may subsequently arise.

To structure this chapter, the two key dimensions identified in the previous chapter will be analysed separately. Whilst overlapping in nature, each dimension raises distinct concerns in relation to the increased accessibility and use of data and the algorithms themselves. First, discussion will focus on the benefits and risks associated with the 'all data is credit data' approach adopted in ACS.[95] This approach provides the benefit of potentially addressing the limitations of traditional credit scoring models through increased access to alternative data, which can result in widening access to credit and furthering financial inclusion. However, increased access to credit is not solely positive, where this benefit must be balanced against the risk of exploitation of vulnerable individuals facing low financial capability when access to credit is extended. Second, discussion will focus on the growing complexity and sophistication of algorithms, focusing on how these developments aim to improve the accuracy and efficiency of creditworthiness assessments. However, whilst these technological developments offer the potential to improve both accuracy and efficiency, considerable risk arises from both the lack of transparency and interpretability of the algorithms used and the risk of discrimination and bias that follows.

[93] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).
[94] Ibid.
[95] Hardy (n 7).

Overall, this chapter will argue that ACS can be of great benefit to supporting the overall functioning of the consumer credit market, although the potential risks and trade-offs that arise must be addressed. In response, this chapter will advocate for regulatory intervention, which may be necessary to ensure that the right balance can be struck to allow the potential benefits of ACS to be harnessed whilst mitigating the potential risks that follow.

2.1 The 'All Data is Credit Data' Approach

In traditional credit scoring models, access to data is limited to traditional financial and credit data only, where alternative, non-credit data cannot typically be accessed by lenders.[96] For borrowers with a credit history that is either limited (thin-file) or non-existent (no-file), this creates a significant problem, as lenders often lack the financial and credit data needed to base a creditworthiness assessment on, resulting in these individuals scoring poorly or being deemed unscorable altogether.[97] This can be problematic for thin-file or no-file borrowers, where these individuals are often denied essential access to credit in response to their lacking credit history and the limited data access of traditional credit scoring models. In response, ACS has evolved from traditional credit scoring models to remedy this problem, where alternative data is used to provide a more accurate assessment of consumer creditworthiness; adopting an 'all data is credit data' approach.[98] By being able to process a much vaster and broader quantity of data in creditworthiness assessments, this provides significant benefit for both lenders and borrowers alike.

2.1.1 *The Benefits of Alternative Data*

This increased access to alternative data is highly beneficial for lenders, where the knowledge gap between an individual with no or limited credit history is reduced, which aids the lender in accurately assessing credit risk by reducing the unknown.[99] For example, the use of alternative data extends the data pool significantly, where information such as rent or mobile phone bills (non-credit, financial data) and social and behavioural data from consumer habits and preferences (non-credit, non-financial data) can be used to assess consumer

[96] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).
[97] Ibid.
[98] Hardy (n 7).
[99] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

creditworthiness.[100] Therefore, this is a significant benefit of ACS, as the use of alternative data allows for increased accuracy in creditworthiness assessments, providing a deeper insight into a borrower's overall financial health.[101]

Additionally, the need for marginal declines in the credit scoring process is reduced when alternative data is used, aiding individuals who very narrowly miss out on access to credit based on traditional scoring models, yet would be unlikely to default on their payments.[102] For an example in practice, the use of alternative data could be a significant help for a couple with limited need for credit, who previously only purchased a mortgage but paid this off years ago and would likely be refused credit if only traditional credit scoring models and data were used.[103] Now, through the use of alternative data such as property valuation, a deeper insight could be provided into the financial history of these borrowers.[104] This view can be demonstrated further through a study conducted by PERC which concluded that where alternative data was used, credit scores increased for 64% of thin-file borrowers, whilst reducing the credit score of only 1% of this same population.[105] Notably, whilst there are clear benefits for thin-file or no-file borrowers, the use of alternative data can also provide benefit to borrowers with an extensive credit history (thick-file); offering increased transparency and visibility into the financial behaviour and identities of *all* individuals.[106]

2.1.2 *Increased Access to Credit*

It has been established that access to alternative data allows lenders to achieve a more holistic, comprehensive view of the financial circumstances of a borrower, which provides the benefit of decreasing the potential credit risk for the lender.[107] In turn, this decreased credit risk also provides the substantial benefit of increasing a borrower's access to credit.[108] By extension,

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[100] Ibid; and Equifax, 'Credit Scoring with Alternative Data: The Way Forward' <https://www.equifax.com.au/knowledge-hub/risk-solutions/credit-scoring-alternative-data-way-forward> accessed 7 May 2024.

[101] Ibid.

[102] Laura Hales, 'Knowledge is Power: How Affordability Assessments Can Benefit Both Lenders and Consumers' (Equifax 2017) 4.

[103] Ibid, 3.

[104] Ibid, 3.

[105] Peter Carroll and Saba Rehmani, 'Alternative Data and the Unbanked' (Oliver Wyman 2017) 13; and Michael A. Turner et al, 'A New Pathway to Financial Inclusion: Alternative Data, Credit Building, and Responsible Lending in the Wake of the Great Recession' (PERC 2012) 12.

[106] Experian, 'Making the Invisible Visible' (n 28) 6.

[107] Hales (n 102) 2.

[108] Ibid, 2.

increased access to credit could further financial inclusion by helping to improve both economic and personal outcomes for financially excluded individuals; increasing their likelihood of being offered affordable rates for credit-risk dependent services such as utilities.[109] Supporting financial inclusion is a hugely significant benefit of ACS, as access to credit is a problem affecting the UK financial system, where approximately 7.1 million (13.2%) UK adults could be potentially classified as financially excluded, a figure which suggests limited access to credit for a considerable proportion of the UK population.[110]

To put this problem into context, thin-file or no-file borrowers can often be young people who were previously too young to apply for credit, individuals with a limited need for credit, or individuals who have moved to the UK from abroad.[111] For these individuals, lenders may be reluctant to offer credit to them due to greater credit risk, as the lack of data means that their past financial performance and history is unknown to the lender, which results in their ability to repay also being unknown.[112] As a result, these individuals are deemed unscorable, and as such are known as 'credit invisible'.[113] This is a significant problem within the UK which ACS aims to remedy, where approximately 637,000 individuals in the UK could be classified as 'credit invisible': meaning that providing a credit score traditionally would be impossible due to the limited data accessible in traditional credit scoring models.[114] If access to credit is limited, this can be detrimental, as the FCA reported in their latest Financial Lives Survey that of 2.9 million adults who were refused credit or a loan, 45% were unable to access the necessary credit they needed at all.[115]

To address this issue, by using alternative data to assess creditworthiness, ACS aims to facilitate the crucial benefit of expanding access to credit for individuals typically excluded by traditional credit scoring models.[116] In turn, this is beneficial by helping to widen credit access

[109] LexisNexis, 'Financial Inclusion: Up to date analysis of access to affordable financial services across the UK' (2022) 2.
[110] Ibid, 3. This statistic is considering 13.2% of the UK adult population aged 16+, accounting for approximately 95% of the total UK population of 53.9 million, as correct at the time of publishing in 2022.
[111] Hales (n 102) 2.
[112] Ibid, 2.
[113] Mike Hepinstall et al, 'Financial Inclusion and Access To Credit' (Oliver Wyman 2022) 3.
[114] LexisNexis, 'Financial Inclusion' (n 109) 3.
[115] FCA, 'Financial Lives 2022: Key Findings from the FCA's Financial Lives May 2022 survey' (2023) 191.
[116] Christina Chua, 'How Is Machine Learning Revolutionizing Credit Scoring?' (*LinkedIn*, 30 January 2024) <https://www.linkedin.com/pulse/how-machine-learning-revolutionizing-credit-scoring-chua-dba-mba--iic8c/> accessed 7 May 2024.

and encourage fairer lending by increasing credit access to a wider pool of individuals across the UK's financial system.[117] Therefore, it can be argued that through increased access to data, and consequential increased access to credit; ACS can further financial inclusion by providing scope for lenders to extend credit to individuals who should be deemed as creditworthy but would be ignored or declined by traditional credit scoring models.

2.1.3 *The Risk of Exploitation*

However, whilst the use of ACS increasing access to credit can be a positive for financial inclusion, there are limitations to this, including the risk of exploitation. This is something that should be approached with caution to ensure that vulnerable borrowers are not exploited, particularly those of lower financial capability. Low financial capability is a significant challenge to be considered when evaluating the benefits and risks surrounding the use of ACS, as 38% of individuals surveyed by the FCA described their financial capability as low: lacking both financial confidence and ability.[118]

Additionally, the FCA found that 12.3 million adults in the UK felt that their credit or loan debt had a 'detrimental impact on their wellbeing' in their most recent Financial Lives 2022 Survey.[119] Arising from these statistics, concerns remain where individuals of low financial capability risk being targeted with unfavourable, unaffordable credit terms when faced with times of extreme vulnerability.[120] For example, due to the impact of the ongoing cost of living crisis, more than 1 in 4 UK adults reported either not coping financially or facing difficulties in coping,[121] where 1 in 7 felt 'heavily burdened' by keeping up with their credit commitments.[122] Addressing this risk is extremely important, as when faced with a challenging economic situation such as this, the line between using credit as a tool for help versus credit becoming a burden can become blurred to vulnerable individuals.[123]

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[117] Remolina, 'The Role of Financial Regulators in the Governance of Algorithmic Credit Scoring' (n 38) 5.
[118] FCA, 'Financial Lives 2022' (n 115) 33.
[119] Ibid, 30.
[120] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 55.
[121] This amounts to 14.6 million (28%) UK adults. See FCA, 'Financial Lives cost of living (Jan 2024) recontact survey' (2024) 5.
[122] This amounts to 7.4 million (14%) UK adults. Ibid, 5.
[123] Richard Barnwell, 'Consumer credit and FCA supervision – what actions should firms be taking?' (*BDO*, 16 May 2024) <https://www.bdo.co.uk/en-gb/insights/industries/financial-services/consumer-credit-and-fca-supervision-what-actions-should-firms-be-taking> accessed 20 August 2024.

Overall, it is important that the benefit of ACS increased access to credit does not result in the risk of exploitation and detriment the financial wellbeing of vulnerable borrowers, where it must be considered that widening credit access may not always be solely positive. As a result, whilst there is motivation towards pushing for financial inclusion using ACS, which is of course necessary, this must be balanced against the need to protect vulnerable borrowers especially from exploitation.[124]

2.2 The Growing Complexity and Sophistication of Algorithms

Traditional credit scoring models have been tried and tested since the 1960's, however there are limitations as to what traditional models can now achieve in a data-driven world. In traditional credit scoring models, statistical techniques such as linear discriminant analysis and logistic regression are often used.[125] These models interpreted data of a set criteria, which resulted in an outcome produced that was highly transparent and the results were relatively straightforward to explain.[126] However, as the volume of data available has increased significantly, the methods and techniques behind traditional credit scoring models now prove insufficient, where they are limited in terms of expansion due to limited data processing capability and high thresholds.[127]

In response, ACS aims to increase the efficiency of creditworthiness assessments through using increasingly complex and sophisticated algorithms. This aims to result in increased speed of service and automation of the scoring process in response to increased data, which overall results in reduced costs as the need for manual underwriting becomes reduced.[128] This is a potential benefit of the use of AI and ML technology in ACS, as the advantages behind the use of such technology can help to improve the efficiency and accuracy of creditworthiness assessments for all parties involved. However, this benefit does not come without increased risk. The applicable benefits and risks will be explored below.

[124] Roberts T et al, 'Credit Scoring Approaches Guidelines' (n 15) XIII.
[125] Ibid, 1.
[126] Equifax, 'Explainable AI for Credit Scoring' (n 70).
[127] Mengling Lin and Jiali Chen, 'Research on Credit Big Data Algorithm Based on Logistic Regression' (2023) 228 Procedia Computer Science 511, 512.
[128] Chua (n 116).

2.2.1 *Increased Accuracy and Efficiency*

In comparison to traditional credit scoring models, ACS provides the benefit of allowing for improved accuracy and efficiency when processing these larger quantities of data, supported by increased speed without compromising on the precision or quality of the scoring.[129] For example, ML technology such as neural networks have grown in popularity to aid with evaluating credit more efficiently.[130] Neural networks provide the benefit of being able to analyse significantly large volumes of data, including unstructured, raw, high-dimensional and anonymised data, to discover correlations relevant to assessing the creditworthiness of a borrower.[131] Therefore, the use of ACS through ML and neural networks provides the benefit of increasing the accuracy and data available for creditworthiness assessments, which can result in the benefit of increased performance and predictions compared to the traditional logistic regression models.[132]

Furthermore, the use of ML technology is highly practical in assessing creditworthiness,[133] facilitating the phenomenon known as deep learning: where non-linear data patterns and correlations often missed by humans can be captured, assessed quickly, and learned from over time through the use of training data.[134] Through being fed training data, neural networks and ML algorithms are able to learn from this data.[135] This improves their accuracy over time, enabling these algorithms to classify and cluster data at high speeds.[136] In practice, the enhanced analytics behind ACS will allow for trends in data to be predicted and identified more efficiently.[137] For example, when evaluating payment data from a borrower's transaction accounts, ML can identify and evaluate data much faster, considering potential attributes such

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[129] Datrics, 'How Credit Scoring Engines Work: A Data Science and Machine Learning Perspective' <https://www.datrics.ai/articles/credit-scoring-using-machine-learning#> accessed 4 April 2024; and Vladimir K. Zhirov et al, 'Neural network as a tool to solve the problem of credit scoring' (2021) 2032(1) 012120 Journal of Physics: Conference Series 1, 6.

[130] Ibid.

[131] Ibid.

[132] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

[133] Hussein Abdou, John Pointon and Ahmed El-Masry, 'Neural nets versus conventional techniques in credit scoring in Egyptian banking' (2008) 35 Expert Systems with Applications 1275, 1276; and Christopher M. Bishop, *Neural Networks for Pattern Recognition* (Clarendon Press, Oxford 1995); and Timothy Masters, *Advanced Algorithms for Neural Networks: A C++ Sourcebook* (Wiley 1995).

[134] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

[135] Larry Hardesty, 'Explained: Neural networks' *MIT News* (Massachusetts, 14 April 2017) <https://news.mit.edu/2017/explained-neural-networks-deep-learning-0414> accessed 7 May 2024.

[136] IBM, 'What is a Neural Network?' <https://www.ibm.com/topics/neural-networks> accessed 10 May 2024.

[137] Hepinstall et al (n 113) 10.

as cash flow stability, potential income growth and other attributes arising from balance to monthly expenses.[138] This can provide substantial benefit to the credit scoring process as compared to manual identification by humans, neural networks are able to classify and cluster data at high speeds, where assigned tasks are able to take merely minutes rather than hours.[139] Notably, the Google search engine algorithm is a popular example of this technology,[140] demonstrating that ACS has the potential for increased speed and efficiency, in clear advantage over traditional credit scoring models.

To provide further context, lenders are able to extend access to credit further to first-time borrowers, such as students living at home post-graduation to save for a deposit for a mortgage, who would be able to display sound financial management to lenders through their current account transactions or current employment in the absence of credit history.[141] In practice, this could mean that predictive technologies and algorithms are used in ACS to evaluate this alternative data, such as predicting future income and employment opportunities.[142] This could help to promote increased access to credit through increasing the accuracy and efficiency of creditworthiness assessments. This is highly beneficial for both parties: for lenders from a business perspective, as lenders are able to extend credit to a wider client base through the use of alternative data; whilst borrowers are able to demonstrate sound financial management despite their lacking credit history, which demonstrates low credit risk as a result.[143] As this technology progresses over time, it is hoped that ACS is able to increase the efficiency and accuracy of creditworthiness assessments for a broader pool of individuals,[144] addressing the limited data processing capacity of traditional credit scoring models.

2.2.2 *The Risk of Bias and Discrimination*

However, the use of ML algorithms in ACS poses a potential challenge regarding the risk of discrimination and bias. Despite the clear benefits of increased access to data, concerns arise

[138] Ibid, 11.
[139] IBM, 'What is a Neural Network?' (n 136).
[140] Ibid.
[141] Hales (n 102) 3; and Gian Boeddu et al, 'Policy Research Paper: Consumer Risks in Fintech: New Manifestations of Consumer Risks and Emerging Regulatory Approaches' (World Bank Group (WBG) 2021) 64.
[142] Datrics, 'How Credit Scoring Engines Work' (n 129).
[143] Experian, 'Making the Invisible Visible' (n 28) 4; and Hales (n 102) 3.
[144] Ying Lei Toh, 'Addressing Traditional Credit Scores as a Barrier to Accessing Affordable Credit' (2023) 3 Federal Reserve Bank of Kansas City Economic Review 21.

from the 'all data is credit data' approach,[145] over the potential for bias and discrimination to arise from the algorithms used. This may be a potential challenge to the use of ACS, as bias refers to any preference taken, whilst discrimination may arise as a consequence, creating a situation where these preferred groups may be systematically advantaged and offered credit, whilst others may be systematically disadvantaged and denied credit.[146] The key issues that may result in algorithmic bias and discrimination will be explored below.

Notably, whilst the use of algorithms in ACS could be highly beneficial in improving creditworthiness assessments, the lack of transparency and explainability that arises as a result brings considerable cause for concern. This argument can be demonstrated through the use of black box algorithms: an algorithm where data is proposed as an input by the user, who can only observe the outputs generated *a priori*, meaning that the outcome generated is based on theoretical deduction from the inputs only.[147] The lack of transparency and interpretability contained within these algorithms could be problematic for both lenders and borrowers: as individuals are often powerless and lack awareness of algorithmic use in ACS,[148] whilst lenders themselves might be left in the dark as to why a borrower was allocated the score that they were.[149] For example, there is anecdotal evidence that changing the screen resolution on a mobile phone can result in a different score generated by an algorithm for lenders.[150]

This issue may raise cause for concern, where, continuing with the black-box example, whilst the complexity and sophistication of these algorithms can increase the predictive accuracy, there is equally increased difficulty in explaining the output produced.[151] As a result, black-box algorithms might be problematic, resulting in outcomes where it is unclear as to what data or combination of data will generate a certain outcome.[152] Therefore, it appears that there is

[145] Hardy (n 7).
[146] Sonja Kelly and Mehrdad Mirpourian, 'Algorithmic Bias, Financial Inclusion, and Gender' (Women's World Banking 2021) 12.
[147] Erwan Le Merrer and Gilles Trédan, 'What is a black box algorithm?: Tracatus of algorithmic decision-making' (HAL Open Science 2023) 4; and 'a priori' (*Merriam-Webster*) <https://www.merriam-webster.com/dictionary/a%20priori> accessed 16 May 2024.
[148] Boeddu et al, 'Consumer Risks in Fintech' (n 141) 5.
[149] O'Dwyer, 'Algorithms are making the same mistakes…' (n 63).
[150] Ibid.
[151] Dave Ramsden and Jessica Rasu, 'Final report: Artificial Intelligence Public-Private Form' (Bank of England and FCA 2022) 3.
[152] O'Dwyer, 'Algorithms are making the same mistakes…' (n 63).

little individuals can do to dispute or amend the score generated by a black-box algorithm.[153] Additionally, the room for bias mixed with the capacity for lack of transparency and interpretability may amount to scores that could be inaccurate, mistaken and possibly unfair.[154] As a result, the limited opacity and complexity of these ML algorithms risks resulting in increased difficulty in either pre-empting or verifying *ex post* whether unlawful discrimination has arisen from the use of proxy data for protected characteristics to reach a conclusion.[155]

The Example of the 'Apple Card Scandal'

Additionally, there is a strong argument that ACS may result is amplified risk of bias, followed by consequent discrimination. A notable example of this is the scandal surrounding the Apple Card, a co-branded credit card offered by Apple and underwritten by bank Goldman Sachs, as reported on by the New York State Department of Financial Services (NYSDFS).[156] Widespread criticism spread on social media after female credit card applicants were allegedly discriminated against by the credit scoring algorithms used, either being unfairly denied the card or offered far lower credit limits than their male partners.[157] For example, the initial allegation arose from an individual who claimed on Twitter that 'although his wife and he file joint tax returns and live in a community property state, he was offered a credit limit on Apple Card 20 times higher than her offer'.[158] This scandal raised public concern about equal credit access, where the use of algorithms and ML in credit scoring posed risk of discrimination, such as the alleged sex-based algorithmic bias arising here.

Here, concerns were voiced that the algorithms used to generate a credit score could not be explained by customer service agents for the Apple Card, resulting in unfair outcomes that lacked transparency and interpretability and appearing to generate bias.[159] Despite these public

[153] Ibid.

[154] Ibid.

[155] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6); and Boeddu et al, 'Consumer Risks in Fintech' (n 141) 64.

[156] New York State Department of Financial Services (NYSDFS), 'Report on Apple Card Investigation' (2021) 1; and Leo Kelion, 'Apple's 'sexist' credit card investigated by US regulator' *BBC News* (London, 11 November 2019) <https://www.bbc.co.uk/news/business-50365609> accessed 29 April 2024.

[157] Holli Sargeant, 'Economic and Normative Implications of Algorithmic Credit Scoring' (*The Columbia Law School Blue Sky Blog*, 11 January 2023) <https://clsbluesky.law.columbia.edu/2023/01/11/economic-and-normative-implications-of-algorithmic-credit-scoring/> accessed 9 May 2024.

[158] DHH, 'The @AppleCard…' (*Twitter*, 7 November 2019) <https://twitter.com/dhh/status/1192540900393705474> accessed 16 May 2024.

[159] NYSDFS (n 156) 4.

concerns, at the request of the NYSDFS, Goldman Sachs were able to explain the individual outcomes generated by the algorithms used through identifying the factors used to generate the credit limits, such as overall credit scores, income, credit utilisation and missed payments.[160] However, consumer trust in the use of algorithms in credit scoring was significantly affected, arising from claims that black-box algorithms were used which produced unexplainable outcomes. Therefore, although Goldman Sachs were able to explain the individual outcomes arising from the complaints, the lack of transparency in the use of algorithms in credit scoring resulted in an outcome of confusion that likely could have been mitigated.

Whilst discriminatory practices were not found in this particular example, as the algorithms and systems used remain unclear to third parties, such as consumers, it does shed light on the difficulties of understanding what is happening 'behind the scenes' with AI algorithms.[161] To address these concerns of bias and discrimination, it is worth considering whether an increased onus might be necessary upon lenders requiring them to demonstrate that their algorithms do *not* result in bias or discrimination, or that such biases are not embedded into their algorithms (rather than looking for evidence that they do).[162]

2.2.3 *Bias in Training Data*

Another key challenge might be the concerns over algorithms, on the basis that the training data used could perpetuate existing biases and result in discrimination and potential unfairness.[163] These concerns arise from the assumption that the processing of alternative data through algorithms could result in either intentional or unintentional bias, as historical data is used to make the decisions: data which has traditionally excluded marginalised consumers with protected characteristics such as ethnicity or gender.[164]

Consequently, the risk exists of an algorithm replicating cultural and societal bias embedded from the training data within it, where this outcome could result in discrimination likely arising from behavioural biases or biases emerging in the training data used.[165] For example, if the

[160] Ibid, 7.
[161] Ward and McNaughton Nicholls, 'Financial Services firms' personal data use' (n 78) 4.
[162] Ibid, 5.
[163] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).
[164] Ward and McNaughton Nicholls, 'Financial Services firms' personal data use' (n 78) 4.
[165] Teresa Bono, Karen Croxson and Adam Giles, 'Algorithmic fairness in credit scoring' (2021) 37(3) Oxford Review of Economic Policy 585, 586.

model is trained on a largely white population, this could result in unlawful discrimination against other segments of the population, where the machine flags up 'out of sample', proxy data.[166] It is worth identifying that arguments have been raised that racial bias appears to be prevalent in algorithms, where the news includes an incorrect facial recognition leading to the false arrest of a black man[167] and failure to identify high-risk patients of colour, resulting in a lower standard of care.[168][169] Therefore, stereotypes and inequalities existing within society may be perpetuated, resulting in a 'feedback loop' where an algorithm affected by bias may learn from, and therefore reinforce, the bias embedded within it.[170] As a result, this is yet another challenge surrounding ACS that regulators might wish to consider.

2.2.4 *Proxy Data*

Furthermore, there may be a risk that bias and consequent discrimination could arise resulting from proxy data, where this increased access to data may result in proxies developing which reflect the sensitive attributes of consumers.[171] In practice, developments arising from data analytics could allow scoring modes to use proxy data allowing them to profile across the data sources used.[172] Additionally, ML algorithms that are trained on identical or similar data sets may differ in accuracy in their decisions reached, which suggests that different algorithms may be able to use the exact same data, yet reach a different outcome completely.[173] For example, proxy data can be defined as the use of personal data, such as social media usage, address or postcode, or shopping habits, to infer the identity and protected characteristics of an individual, such as their age, ethnicity or gender.[174] In practice, if a postcode known for a significant proportion of ethnic minority residents is provided in a credit application, algorithms could use

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[166] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

[167] Bobby Allyn, ''The Computer Got It Wrong': How Facial Recognition led To False Arrest Of Black Man' *NPR* (Washington, June 24 2020) <https://www.npr.org/2020/06/24/882683463/the-computer-got-it-wrong-how-facial-recognition-led-to-a-false-arrest-in-michig> accessed 17 June 2024.

[168] Shraddha Chakradhar, 'Widely used algorithm for follow-up care in hospitals is racially biased, study finds' *STAT* (Boston, 24 October 2019) <https://www.statnews.com/2019/10/24/widely-used-algorithm-hospitals-racial-bias/> accessed 17 June 2024.

[169] Zachary Arnold and Helen Toner, 'AI Accidents: An Emerging Threat – What Could Happen and What to Do' (Center for Security and Emerging Technology 2021) 16.

[170] Boeddu et al, 'Consumer Risks in Fintech' (n 141) 64.

[171] Ward and McNaughton Nicholls, 'Financial Services firms' personal data use' (n 78) 5.

[172] Ibid, 8; and Organisation for Economic Co-operation and Development, 'Executive Summary of the discussion on Personalised Pricing in the Digital Era' (2020).

[173] Bono, Croxson and Giles (n 165) 596.

[174] Ward and McNaughton Nicholls, 'Financial Services firms' personal data use' (n 78) 8.

this information as a proxy for the ethnicity of the borrower.[175] As a result, the credit services provided to that individual could be limited or adjusted based on this proxy data, where algorithms could inadvertently result in unfair bias, building 'profiles' on an individual based on this proxy data, whether this sensitive information is disclosed or not.[176] Therefore, there is a risk of proxy data resulting in individuals with lower incomes having lower scores generated by association, even if these protected characteristics are not directly taken into account.[177]

2.3 Conclusion

In conclusion, this chapter has demonstrated that ACS may present itself as a 'double-edged sword': offering both potential benefits and risks hand in hand.[178] Crucially, it has been argued that ACS offers the potential benefit of supporting the overall functioning of the consumer credit market. This argument has been explored through the benefit of accessibility and use of alternative data, thereby expanding access to credit and furthering financial inclusion; and increasing the accuracy and efficiency of creditworthiness assessments due to the complexity and sophistication of the algorithms used. However, it is argued that the potential trade-offs arising from the risks of ACS should not be underestimated or ignored. This argument has been explored through assessing the risks of exploitation of vulnerable consumers, the lack of transparency and interpretability in black-box algorithms, and discrimination and bias. Such risks may necessitate regulatory intervention to ensure that they are addressed proportionately.

In response, this chapter argues that there might be scope for regulatory intervention to proportionately address the risks that may arise from the use of ACS. To continue this discussion, the following chapter will discuss how financial regulation could balance the benefits and risks explored. The normative goals and challenges of financial regulation will be explored as applicable to ACS, setting the stage for discussion as to how best to structure the regulatory approach to be effective.

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[175] Ibid, 8.

[176] Ibid, 8; and Boeddu et al, 'Consumer Risks in Fintech' (n 141) 5.

[177] Alexandra Ciocanel et al, 'Code encounters: Algorithmic risk profiling in housing: a literature review' (2022) University of York Centre for Housing Policy Working Paper No. 1, 25 <https://www.york.ac.uk/media/chp/documents/2022/Code%20Encounters%20Algorithmic%20risk%20profiling%20in%20housing%20a%20literature%20review.pdf> accessed 19 June 2024.

[178] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

Chapter 3: The Goals and Challenges of Financial Regulation

The previous chapter has demonstrated how ACS presents itself as a 'double-edged' sword,[179] where both the potential benefits and risks associated with the use of ACS have been explored. Whilst the use of ACS has the potential to benefit the overall functioning of the consumer credit market, it also has potential risks and subsequent trade-offs that may need to be addressed through regulation. To build upon this previous discussion, this chapter frames the regulation of ACS in the context of the regulatory goals and challenges which financial regulation tries to address.

Due to the complexity and ongoing debate surrounding ACS, this chapter will be structured as follows. First, a more traditional approach to discussing financial regulation will be adopted, where the risk of market failure of the consumer credit market will be discussed. Within this discussion, it will be emphasised that there may be a need for regulatory intervention to proportionately address the potential risks arising in new financial products, services and business models. Following this, discussion will address how ACS may conflict with the normative goals in financial regulation of allocative efficiency and distributional fairness. Second, discussion will move to the unique regulatory challenges that ACS may bring. This point will be raised on the basis that ACS extends beyond the scope of traditional financial regulation and its challenges due to the use of AI, spilling over into neighbouring areas of the law such as consumer protection and data privacy. To discuss this, the unique challenges of regulating AI will be discussed, focusing on how consumer trust may need to be built before the adoption of ACS can be increased. Finally, the potential trade-offs arising from ACS will be explored, focusing on the impact of ACS on consumer privacy and autonomy and the potential need for additional regulation to protect borrowers as consumers. Within this discussion, it will be argued that this need may need to be balanced against the potential regulatory cost to innovation, where over-regulation may cause harm and stifle innovation.

Overall, this chapter will introduce the need for regulatory intervention to ensure that the UK's consumer credit market can mitigate the challenges that arise. This will set up the remaining chapters to assess the UK's existing regulatory approach to ACS, and ultimately, propose reform to ensure that the regulatory goals of financial regulation are met.

[179] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

3.1 Market Failure

Firstly, the need for regulatory intervention, in particular for ACS, is typically premised upon identified market failures. Such failures occur where goods and services are inefficiently distributed, resulting in a lack of equilibrium within the free market.[180] The functioning of the free market is essential, as this is an economic system determined by supply and demand with minimal external intervention, where consumers and businesses alike are able to mutually benefit and engage freely in dealings between one another.[181] In the event of market failure, the free market could collapse, which would require regulatory intervention to remedy the consequences of failure and restore balance.

The consequences of market failure can be hugely detrimental, where the social costs emerging from potential behavioural market failure risks threatening social welfare; on the basis that the efficient functioning of the consumer credit market is vital to the real economy.[182] For example, if the consumer credit market surrounding ACS specifically were to be entirely unregulated, this could result in inefficiencies and undesirable distributional outcomes for consumer credit.[183] This is on the basis that lenders would be likely to exploit the system to gain benefit from the use of ACS, where one of the main drivers of the financial system and its dynamic nature is the constant effort of market players to exploit and identify the ideal regulatory environment that is available to them.[184] Therefore, there may be an amplified risk of lenders using ACS to exploit the behavioural biases and characteristics of vulnerability of borrowers. In response, it will be discussed whether ACS is beneficial for borrowers overall, based on its use and purpose.[185]

The Example of 'Alt-A' Mortgages

To provide an example, the market failure arising from the past of 'Alt-A' mortgages is emphasised, where the situation with extending credit to thin-file or no-file individuals,

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[180] Sean Ross, 'How Is a Market Failure Corrected?' (*Investopedia*, updated 29 April 2024) <https://www.investopedia.com/ask/answers/042115/how-market-failure-corrected.asp> accessed 9 July 2024.

[181] Oxford Scholastica Academy, 'What Is Market Failure?' (3 June 2024) <https://www.oxfordscholastica.com/blog/what-are-market-failures/> accessed 15 July 2024.

[182] Bar-Gill (n 44) 3.

[183] Campbell et al (n 48) 92.

[184] John Armour et al, *Principles of Financial Regulation* (OUP 2016) 13.

[185] Bank of England and FCA, 'Discussion Paper DP5/22 – Artificial Intelligence and Machine Learning' (2022) 23.

typically from worse financial backgrounds, risks paralleling the outcome here.[186] These mortgages caused underwriting standards to be loosened for high-risk borrowers, which (to simplify it) resulted in the 2008 financial crisis.[187] In the financial crisis, instability arose when banks issued the risky subprime mortgages and 'Alt-A' mortgages, which sparked issues as lending increased to allow all individuals to access a mortgage, regardless of their financial standing.[188] This practice was particularly risky, where lenders frequently gave loans or mortgages to lower-income borrowers who could not afford them. This resulted in the financial crisis, followed by significant reduction of credit to lower-income households by lenders afterwards.[189] Consequently, lower-income households were unfairly blamed for 'easy credit', where the impact of limited access to credit was felt disproportionately by these lower-income households and individuals.[190] Therefore, without sufficient financial regulation, there is a risk that the use of ACS may follow suit and become a source of inefficiency and unfairness within the consumer credit market.[191]

Furthermore, the purpose of financial regulation is to assist the market in functioning better than it would be able to in its absence.[192] To achieve its purpose, regulation must ensure that the consumer credit market can function both fairly *and* efficiently in the interests of borrowers and lenders alike. To do so, various goals must be met to ensure that financial regulation is fit for purpose. It is acknowledged that these various goals may overlap and be traded-off against one another, therefore outlining these goals and objectives clearly below is essential to ensure regulation appropriately addresses them all to avoid market failure. To frame this discussion on market failure in the context of ACS, the normative goals of allocative efficiency and

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[186] Mark Adelson, 'A Journey to the Alt-A Zone: A Brief Primer on Alt-A Mortgage Loans' (Nomura Fixed Income Research 2003) 1-3.

[187] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 55.

[188] Kirsten Grind, 'Remember 'Liar Loans'? Wall Street Pushes a Twist on the Crisis-Era Mortgage' *The Wall Street Journal: Central Banking* (New York, 1 February 2016) <https://www.wsj.com/articles/crisis-era-mortgage-attempts-a-comeback-1454372551> accessed 12 July 2024.

[189] Max Ehrenfreund, 'It's time to stop blaming poor people for the financial crisis' *The Washington Post* (Washington, 15 June 2017) <https://www.washingtonpost.com/news/wonk/wp/2017/06/15/its-time-to-stop-blaming-poor-people-for-the-financial-crisis/> accessed 12 July 2024.

[190] Ibid.

[191] Hurley and Adebayo (n 2) 149; and Gerhard Wagner and Horst Eidenmueller, 'Down by Algorithms? Siphoning Rents, Exploiting Biases and Shaping Preferences – The Dark Side of Personalized Transactions' (2018) University of Chicago Law Review, Forthcoming Oxford Legal Studies Research Paper 20/2018 <https://ssrn.com/abstract=3160276> accessed 26 April 2024.

[192] Armour et al (n 184) 53.

distributional fairness will be explored below, focusing on how these goals may conflict with its use.

3.2 The Goal of Allocative Efficiency

As identified above, the purpose of financial regulation is to assist the financial system and its markets in being able to function efficiently. In the case of ACS, it is argued that allocative efficiency is the most central to this debate: where lenders assess the credit risk and subsequent creditworthiness of borrowers to ensure that capital is allocated to the most valuable and financially beneficial uses.[193] In this context, this allocation of capital would be offering credit to the most 'creditworthy' borrowers. Therefore, ensuring that the consumer credit market is able to function *efficiently* is a key goal to fulfil the purpose of financial regulation.

3.2.1 *Allocative Efficiency in Algorithmic Credit Scoring*

On the surface, ACS appears to satisfy the goal of increasing allocative efficiency where the use of ML technology aims to reduce the cost and time required to acquire and process credit data.[194] In doing so, this provides benefit to the financial system by encouraging financial stability. This benefit arises because of the increased access to alternative data, and also due to the sophistication and complexity of the algorithms used, which allow data to be processed and analysed far more efficiently than in traditional credit scoring models.

Additionally, ACS offers the benefit of reducing allocative *inefficiency*: where the use of alternative data aims to increase the accuracy of creditworthiness assessments.[195] By using alternative data, lenders are provided with a greater insight into the assessment of credit risk, whilst also reducing the likelihood of unaffordable borrowing for borrowers by improving assessment of affordability. As discussed in the previous chapter, these gains in efficiency are the most impactful for thin-file and no-file borrowers, who are traditionally excluded from the provision of consumer credit. Therefore, the use of ACS can simultaneously improve allocative efficiency *and* reduce allocative inefficiency by increasing access to affordable credit.

However, in practice, ACS may face challenges which conflict with and disrupt the normative goal of allocative efficiency. As a result, there is a need for increased regulation addressing

[193] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 48.
[194] Ibid, 53.
[195] Ibid, 53-54.

ACS directly to meet this goal of increased efficiency. The relevant issues and challenges will be discussed below.

3.2.2 *The Challenge of Information Asymmetry*

For example, issues may arise in consumer credit markets through traditional failures of information asymmetry: where borrowers as consumers lack information in comparison to lenders, resulting in imbalances in market power and coordination failure.[196] Individuals may lack the sufficient information to make an informed decision because of the information asymmetry between lenders and borrowers, where this risk may be increased by ACS due to the use of alternative data and, as a result, increased access to personal information.[197] In the event of large purchases associated with credit scoring, such as the purchase of a mortgage which involves substantial borrowing over an extended period of time, issues of uncertainty and complexity are exacerbated where even a relatively small misjudgement due to lack of information could result in a great loss to the consumer as the product itself matures.[198]

Consequently, there is an increased potential for the exploitation of consumer ignorance arising from information asymmetry, as lenders are in a position faced with market power, with a natural informational advantage over borrowers as consumers.[199] As a result, borrowers may be placed in a vulnerable position. This could occur where vulnerable borrowers become likely targets for exploitation by unscrupulous lenders, who extend credit on terms that are worse than advertised or inappropriate in that individual borrower's circumstances, resulting in the problem of adverse selection.[200]

This view can be developed further by George Akerlof's theory of a market for 'lemons', which demonstrates the consequences of information asymmetry, provided in the context of an example of a second-hand car market.[201] In this example, Akerlof's theory argues that a seller

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[196] Campbell et al (n 48) 92.
[197] Sargeant, 'Algorithmic decision-making in financial services' (n 90) 1310.
[198] Armour et al (n 184) 55.
[199] Richard M. Hynes and Eric A. Posner, 'The Law and Economics of Consumer Finance' (2001) University of Chicago John M. Olin Law & Economics Working Paper No. 117, 6 <https://ssrn.com/abstract=261109> accessed 11 July 2024.
[200] Giesela Rühl, 'Consumer Protection in Choice of Law' (2011) 44(3) Cornell International Law Journal 569, 573.
[201] George A. Akerlof, 'The Market for "Lemons": Quality Uncertainty and the Market Mechanism' (1970) 84(3) Quarterly Journal of Economics 488, 490.

of a second-hand car has the privilege of knowing the defects and problems of that car, whilst the buyer is unaware, which results in an outcome where a defective car (a 'lemon') may be offloaded to an unsuspecting buyer.[202] However, the issue here runs deeper, as if a buyer is unable to be certain of the quality of a product, there is a decreased likelihood of that buyer offering more than the prevailing price for a product of average quality, negatively impacting both the worth and utility of that particular product.[203] In response, sellers are more likely to offer cars with a real value of less than the average price offered, which drives down the average quality of cars on that market, and in turn, the price buyers would be willing to pay.[204]

Arising from this analogy, Akerlof argues that the 'lemons' are likely to drive the good cars out of that particular market, affected in a continuous chain until only the bad cars remain, creating a situation where no market exists at all.[205] Akerlof's theory illustrated that information asymmetry can result in market collapse, as 'lemons' as poor quality products remain, as a result of the buyer purchasing them due to lack of sufficient information, where their only option is to rely on the (lack of) information that the seller provides them with.[206] This creates a problem of 'systematic adverse selection' through information asymmetry: as the only cars available on the market are 'lemons' which results in an outcome of unfair treatment for buyers and the collapse of that market.[207] Therefore, there may be a clear need for proportionate regulation for ACS to address the information asymmetry between lenders and borrowers, as this will help to avoid market failure and ensure that the consumer credit market is able to function well and efficiently by supporting the goal of allocative efficiency.

Protecting the Proprietary Rights of Lenders

However, reducing the information asymmetry between lenders and borrowers must come with careful consideration to protecting the proprietary rights of lenders. This challenge arises as the algorithms used are often proprietary algorithms: which means that the algorithm and training data used are exclusively used by the lender, who may be reluctant to disclose the algorithms

[202] Ibid, 490.
[203] James Chen, 'The Problem of Lemons: Buyer vs. Seller' (*Investopedia*, updated 13 February 2024) <https://www.investopedia.com/terms/l/lemons-problem.asp#citation-2> accessed 14 July 2024.
[204] Akerlof, 'The Market for "Lemons"' (n 201) 490.
[205] Ibid, 490.
[206] George A. Akerlof, 'Writing the "The Market for 'Lemons'": A Personal Interpretive Essay' (*The Nobel Prize Outreach AB 2024*, 14 November 2003) <https://www.nobelprize.org/prizes/economic-sciences/2001/akerlof/article/> accessed 14 July 2024; and Chen (n 203).
[207] Akerlof, 'The Market for "Lemons"' (n 201) 490; and Armour et al (n 184) 56.

and processes used for business purposes or as trade secrets.[208] This places lenders in a position where they possess insider knowledge through their proprietary rights, which they are reluctant to disclose.[209] Whilst this is understandable, it also creates a potential issue as lenders may stand to use this information to work around the regulatory structures in place.[210] Overall, this is a consideration that should be carefully considered through regulation, to ensure that consumer detriment is avoided and that borrowers do not face unnecessary harm as a result.

3.3 The Goal of Distributional Fairness

Furthermore, it is crucial to acknowledge that regulatory intervention may be needed to ensure resources are allocated both efficiently *and* fairly across the consumer credit market.[211] This argument arises as even if the allocation of resources had resulted from a perfectly efficient competitive market, this may not result in an allocation of resources that is desirable.[212] Therefore, it is crucial that regulation should serve to address the goal of allocative efficiency and maintain the stability of the financial system, whilst balancing this against the goal of distributional fairness and the need for financial inclusion.

3.3.1 *Distributional Fairness in Algorithmic Credit Scoring*

The goal of distributional fairness is paramount to the discussion of regulation for ACS. By increasing the accuracy of consumer creditworthiness assessments through the use of alternative data, the use of ACS can support this goal in its nature. For example, this increased accuracy allows lenders to gain a broader insight into a borrower's financial health, which can help support financial inclusion by increasing access to credit for thin-file and no-file borrowers who were typically excluded by traditional scoring models.[213] Both borrowers and lenders can benefit from increased financial inclusion, where these borrowers can have increased access to credit, whilst lenders are able to diversify their lending pool which helps to mitigate risk exposure.[214]

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[208] Bundy et al (n 84) 21.
[209] Ibid, 21.
[210] Armour et al (n 184) 13.
[211] Ibid, 54.
[212] Ibid, 54.
[213] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 56.
[214] Moeti Damane and Sin Yu Ho, 'The Impact of financial inclusion on financial Stability: review of Theories and international Evidence' (2024) 11 Development Studies Research 1-2.

Reducing Distributional Unfairness

Additionally, distributional *unfairness* may also be reduced by the use of ACS. This outcome can be achieved as there is limited access to unaffordable credit; the more detailed the assessment, the more accurate picture of a borrower's credit risk and affordability will likely be.[215] This can be beneficial in avoiding harm and unfairness for financially illiterate or vulnerable individuals by ensuring that whilst access to credit *is* increased, it is only increased for those who can afford it.[216] For example, whilst access to credit can be utilised as a positive tool for improving financial resilience, a survey conducted by debt charity StepChange estimated that 4.4 million UK adults used credit as a 'safety net' to allow them to meet existing costs and bills.[217] Therefore, whilst in appropriate circumstances increased access to credit and financial inclusion can bring social and economic benefits, it is important to mitigate the risk of harm and poor outcomes for borrowers using credit in this manner.

As a result, limiting access to unaffordable credit is important in achieving the goal of distributional fairness by encouraging protection for the more vulnerable members of society, including those who are financially illiterate, or may demonstrate limited behavioural and cognitive abilities, as well as acknowledging power imbalances within the structure of the consumer credit market.[218] For these individuals, being denied credit in the long run if ACS is used is likely to be more beneficial, and support distributional fairness, if the risk of unaffordable debt is mitigated as a result.[219] Therefore, it is argued that regulation could help ensure that ACS supports distributional fairness by protecting vulnerable borrowers from taking on unaffordable debt, where ACS can balance the goal of increasing access to credit whilst avoiding the dangers of over-indebtedness.

3.3.2 *The Conflict Between Financial Inclusion and Financial Stability*

Whilst ACS can support distributional fairness by increasing financial inclusion, it is acknowledged that this could also compromise the stability of the financial system.[220] The

[215] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 56.
[216] Ibid, 49. It is acknowledged that there is overlap with the goal of allocative efficiency here, as this positive helps to avoid inefficient borrowing outcomes, such as bankruptcy, homelessness, or foreclosure, etc.
[217] Adam Butler, 'Falling behind to keep up: the credit safety net and problem debt' (StepChange 2022) 3.
[218] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 50.
[219] Ibid, 58.
[220] Ruslan Arykov, Sai Krishna Kumaraswamy and Ivo Jeník, 'Financial Inclusion and Stability: A Balancing Act' (*CGAP*, 22 March 2024) <https://www.cgap.org/blog/financial-inclusion-and-stability-balancing-act> accessed 10 December 2024.

goals of financial inclusion and financial stability may come into conflict with one another in the context of ACS, particularly where credit is extended to higher-risk borrowers in the interests of supporting financial inclusion. For example, extending credit to these individuals could lower lending standards, which may result in pockets of risk emerging in the financial system.[221] If these risks were to materialise, this may result in negative consequences similar to the 2008 financial crisis, as not all borrowers are creditworthy or capable of managing credit responsibly.[222]

To address this conflict, there is a need for a balance to be struck between supporting financial inclusion and maintaining financial stability when ACS is used.[223] As such, regulation may be necessary here to mitigate any potential risk and to ensure that the benefits of financial inclusion can be preserved, whilst ensuring that the stability of the financial system is maintained.

3.3.3 *The Challenge of Consumer Protection*

Furthermore, concerns remain where individuals of low financial capability may risk being targeted with unfavourable credit opportunities during moments of 'extreme vulnerability'.[224] Alternatively, this could worsen distributional unfairness, giving rise to discussion on consumer protection concerns. For example, this is an important consideration as no-file or thin-file borrowers typically tend to be lower-income, lesser-educated individuals, which could result in increased susception to exploitation if ACS is not well regulated.[225] In turn, this can have a ripple effect of causing undesirable distributional outcomes for the provision of consumer credit.[226] As a result, regulation for ACS should also consider the varied needs of all borrowers, whilst addressing the potential risk of harm faced if ACS is not appropriately regulated and sufficient protection is not extended to these individuals.

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[221] Peter J. Morgan and Victor Pontines, 'Financial Stability and Financial Inclusion' (2014) ADBI Working Paper Series No. 488, 6 <https://www.adb.org/sites/default/files/publication/156343/adbi-wp488.pdf> accessed 10 December 2024.

[222] Ibid, 6; and Martin Čihák, Davide S. Mare and Martin Melecky, 'The Nexus of Financial Inclusion and Financial Stability: A Study of Trade-Offs and Synergies' (2016) World Bank Group Policy Research Working Paper No. 7722, 2 <https://documents1.worldbank.org/curated/en/138991467994676130/pdf/WPS7722.pdf> accessed 10 December 2024.

[223] Čihák, Mare and Melecky (n 222) 17.

[224] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 55.

[225] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

[226] Campbell et al (n 48) 92.

3.4 Consumer Trust in AI

Beyond the scope of traditional financial regulation and its challenges, ACS presents the unique challenge of using AI, which requires the need to encourage trust around this technology and the use of ACS in itself. Building trust is essential to increase the adoption and acceptance of AI in the consumer credit market.[227] There are two elements to trust surrounding the use of AI: user trust and consumer trust. For the purposes of this thesis, consumer trust will be the focus of discussion for ACS, on the basis that borrowers as consumers must be able to trust that the use of AI and increased access to data through ACS will provide benefit to them through improving creditworthiness assessments.

In the context of ACS, it will be argued that addressing consumer trust through financial regulation is essential, as borrowers must be able to have trust and confidence in the consumer credit market for it to function fairly and efficiently. Therefore, borrowers should feel empowered and have trust, confidence and faith in the financial system when ACS is used to assess their creditworthiness.[228] To engage with this discussion, this thesis will identify the key issues affecting consumer trust in ACS, where the significance of these issues in practice, and the potential resolutions in response, will be addressed below. However, a careful balance must be struck here when determining the regulatory approach taken, as whilst correcting market failures is important to ensure financial markets are able to function efficiently, the costs of remedying these failures may outweigh the potential benefits.[229]

3.4.1 *Low Consumer Trust in the Financial Services Industry*

Currently, consumer trust in the financial services industry, and by association the consumer credit market, is considerably low in the UK. This view can be demonstrated by the FCA's recent Financial Lives survey, which concluded that only 1 in 9 adults strongly agreed and 3 in 10 slightly agreed with the statement that they have trust and confidence in the UK financial services industry.[230] Therefore, whilst it is acknowledged that there is overlap of issues of consumer trust arising in other areas of the law, such as data protection or human rights, it is

[227] Hyesun Choung, Prabu David and Arun Ross, 'Trust in AI and Its Role in the Acceptance of AI Technologies' (2022) 39(9) International Journal of Human-Computer Interaction 1727, 1729.
[228] FCA, 'Finalised guidance: FG21/1 Guidance for firms on the fair treatment of vulnerable customers' (2021) 12.
[229] Armour et al (n 184) 52.
[230] FCA, 'Financial Lives 2022' (n 115) 221.

argued that consumer trust is a challenge for financial regulation *specifically*, as consumers must be able to have trust and confidence in the consumer credit market.

In turn, this issue risks perpetuating the issue by decreasing consumer trust further within the UK's financial services industry. Therefore, there is a risk that ACS will further erode consumer trust within the consumer credit market.[231] In addition, it is clear that regulation helps to establish the reputation of financial markets, in the interests of both borrowers and lenders.[232] To help grow and develop the use of ACS, it may be necessary to ensure that the UK's financial market appears as transparent, resilient and efficient, which will help ensure that the market is both stable, safe and fair. In turn, this could potentially aid lenders in securing their reputation, aid the financial services industry by instilling consumer trust and confidence, and aid borrowers by allowing the provision of credit to function both fairly and efficiently. At this stage of the thesis, it is yet to be determined what this could mean for ACS. However, it is nevertheless acknowledged that improving consumer trust might need to be addressed through the regulation of ACS to ensure that borrowers have trust and confidence in the consumer credit market.

3.4.2 *The Lack of Transparency in Black-Box Algorithms*

When considering improving consumer trust, the lack of transparency within ACS could potentially be a cause for concern for borrowers. This argument arises as where there is a lack of transparency surrounding the algorithms used in credit scoring, consumer trust is likely to be impacted negatively as borrowers may be unlikely to trust new developments in ML technology to make such significant decisions regarding their access to credit. This view can be supported by a study by firm Out-Law and Innovative Finance, which concluded that only 40% of financial services consumers[233] would be comfortable with AI being used to assess credit scores.[234] Therefore, it is essential that financial regulation steps in to help improve

[231] Sargeant, 'Algorithmic decision-making in financial services' (n 90) 1307.

[232] Sheldon Mills, Executive Director, Consumers and Competition, 'How innovation and regulation in financial services can drive the UK's economic growth' (Speech at the CityUK Annual Conference 2023, 29 June 2023) <https://www.fca.org.uk/news/speeches/how-innovation-and-regulation-in-financial-services-can-drive-uk-economic-growth> accessed 9 July 2024.

[233] Of 800 UK adults surveyed.

[234] Luke Scanlon, 'Survey reveals consumer appetite for AI in financial services' (*Pinsent Masons, Out-Law*, 3 July 2019) <https://www.pinsentmasons.com/out-law/news/survey-reveals-consumer-appetite-for-ai-in-financial-services> accessed 21 June 2024; referring to Yvonne Dunn and Luke Scanlon, 'AI in Financial Services – Impact on the Customer' (Pinsent Masons and Innovative Finance 2019).

consumer trust by increasing the transparency level of the use of AI in credit scoring through ACS.

To make this argument, the use of black-box algorithms will be the focus of discussion. A clear example of this in practice is the 'Apple Card' scandal.[235] This example highlights that issues of bias and discrimination may result, or appear to result, from the use of ACS, as the decisions made in relation to credit appeared to be both unjustified and unexplainable from the perspective of the public.[236] If the perception held by the wider public was that ACS could result in a lack of transparency and interpretability and an amplified risk of bias and discrimination, consumer trust may be detrimentally impacted as a consequence of this negative perception.

Additionally, there is a risk that this increased access to data could instead perpetuate existing bias and result in discrimination if it were the case that the algorithms themselves were unable to differentiate between contextual and situational factors.[237] This may arise in practice where an algorithm may struggle to differentiate between past or existing credit problems from transitory issues, such as divorce or redundancy, where this individual may be assigned a similar credit score to an individual whose problems are a reflection of poor financial management through excessive spending habits, or a general unwillingness to repay debts owed.[238] As a result, whilst there are benefits to the use of alternative data, the potential for the outcomes generated to be potentially unfair must be considered to address concerns over transparency and interpretability.

3.5 Consumer Privacy and Autonomy

The challenge of building consumer trust through financial regulation requires addressing the need to safeguard consumer privacy, which may result in regulatory overlap between financial regulation and data protection regulation.[239] This can be explored as ACS introduces two

[235] Kelion (n 156).
[236] Ibid.
[237] Dawn Burton, 'Credit Scoring, Risk, and Consumer Lendingscapes in Emerging Markets' (2012) 44(1) Environments and Planning A 111, 115; and Robert B Avery, Paul S Calem and Glenn B Canner, 'Consumer credit scoring: Do situational circumstances matter?' (2004) 28(4) Journal of Banking & Finance 835.
[238] Ibid, 115.
[239] Secretary of State for the Department of Digital, Culture, Media and Sport, *National AI Strategy* (CP 525, 2021) 16.

primary types of harm to consumer privacy. First, there is an increased scope of 'objective' harm, such as data breaches resulting in coercion or identify theft.[240] Secondly, increased scope for 'subjective' harm, from 'chilling effects' of behavioural profiling and constant surveillance of data, coupled with a borrower's lowered ability to understand and control the use of their personal data, and the impact that this might have on their financial identity.[241] Therefore, the 'all data is credit data' approach could be harmful for borrowers, as their behaviour is constantly monitored and used to shape their credit profile.[242] As ACS poses a threat to consumer privacy, this also results in a threat to consumer autonomy, where the unique issues arising from the use of ACS and AI will be explored below.

3.5.1 *Mitigating the Risk of Exploitation and Over-Surveillance*

In practice, there may be a risk of vulnerable borrowers being exploited when their behavioural insights are tracked through ACS and the use of alternative data. For example, individuals may be targeted based on their behaviour derived from the data-driven insights.[243] In the context of ACS, this problem can arise as almost every individual has a digital footprint: where the data gathered can be from as simple as registering on or accessing a webpage.[244] For example, this simple action results in the webpage tracking the type of device used, such as Android or iOS, or tracking whether the user entered the webpage via a search engine or by clicking on an ad.[245] If over-surveillance were to arise as a consequence of the use of alternative data in ACS, this could result in a 'surveillance' society.[246] Such a risk could be attributed to the over-collection of data, which can be detrimental to borrowers by compromising consumer privacy unnecessarily.[247]

Therefore, the benefit of accessing alternative data must be balanced against both the trade-off of lower consumer autonomy over the use of their personal data versus the seemingly improved

[240] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 58.
[241] Ibid, 59.
[242] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 59; and Hardy (n 7).
[243] Ibid, 57.
[244] Tobias Berg et al, 'On the Rise of FinTechs: Credit Scoring Using Digital Footprints' (2020) 33 Review of Financial Studies 2845, 2846.
[245] Ibid, 2846.
[246] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 60.
[247] Jack Hirshleifer, 'The Private and Social Value of Information and the Reward to Inventive Activity' (1971) 61(4) The American Economic Review 561, 567.

autonomy arising from improved access to credit or reduced access to unaffordable credit.[248] Balancing these 'autonomy-autonomy trade-offs' is difficult, as the long-term harm to consumer privacy and autonomy may outweigh the benefits of increased access to credit when ACS is used.[249] However, there is arguably difficulty in offsetting the gains in autonomy through access to credit through the long-term, systemic harm that may arise overall to consumer privacy and autonomy when ACS is used.

Additionally, these concerns must be balanced against the goal of increasing credit access, against the risk of lenders using data not to expand credit access but *instead* to be selective over who is able to access credit, such as favouring a particular group, where this may result in an outcome of unfair discrimination.[250] Whilst it is noted that direct discrimination risk may be reduced through ACS as this is not face-to-face, the risk of indirect discrimination could increase due to ML proxies, etc. For example, by using such models 'in the wild' without rigorous testing could have detrimental results for borrowers.[251] Overall, the role of financial regulation here might be to help encourage consumer trust surrounding the use of ACS by determining the proportionate use of personal data.

3.6 The Potential Cost to Innovation

Finally, the need for regulation must carefully address the debate surrounding innovation and safety, as whilst increased regulation may serve to protect borrowers, this could potentially come at the cost of stifling further innovation.[252] On this basis, regulation aims to ensure that innovation has limited conflict with fundamental rights and goals of public policy.[253] This is argued on the basis that regulation aims to mitigate the potential negative consequences of

[248] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 59.
[249] Ibid, 59.
[250] Ibid, 55; and Julapa Jagtiani, Lauren Lambie-Hanson and Timothy Lambie-Hanson, 'Fintech Lending and Mortgage Credit Access' (2019) Federal Reserve Bank of Philadelphia Working Paper No. 19-47 <https://ssrn.com/abstract=3494195> accessed 11 July 2024.
[251] Ibid, 57.
[252] Dara Tarkowski, 'Our Regulatory Environment Stifles Tech and Finance Innovation' *Bloomberg Law* (Virginia, 13 March 2023) <https://news.bloomberglaw.com/us-law-week/our-regulatory-environment-stifles-tech-and-finance-innovation> accessed 19 June 2024.
[253] Anna Butenko and Pierre Larouche, 'Regulation for innovativeness or regulation of innovation?' (2015) 7(1) Law, Innovation and Technology 52, 65.

innovation through technological and computational developments, whilst maintaining consumer protection through consumer privacy.[254]

Notably, the consumer credit market may suffer negative consequences if the regulatory costs are disproportionate to the benefits of regulation, where innovation may be stifled as a consequence.[255] For example, there is concern surrounding how innovation may be detrimentally impacted by over-regulation.[256] The crux of this argument is that, whilst regulation has the potential to stifle innovation if too prescriptive in its approach, there is an amplified risk of restricting or penalising novel ideas and solutions to credit scoring.[257] However, in acknowledging this argument, it must also be noted that increased regulation does not necessarily stifle innovation in its design, where regulation may instead incentivise lenders to design credit scoring algorithms with safety and consumer privacy in mind.[258]

In response to both sides of this argument, it is argued that a careful balance must be struck when regulating ACS to ensure the opportunities ACS presents are taken advantage of, whilst the regulatory action taken to mitigate the potential risks does not face too great of a cost to innovation.[259] Therefore, it is essential that regulation must not be too prescriptive, to help in striking a balance between having both increased innovation *and* increased safety more broadly to protect the interests of all parties involved.[260] If this is considered, it is possible that there may be the potential for both supportive innovation and increased regulation to co-exist.[261]

3.7 Balancing Conflicting Regulatory Goals

Crucially, a key aspect of regulation is addressing potential conflicts that may arise between different goals, both within and across different areas of the law.[262] Specifically, it may be

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[254] Sofia Ranchordás, *Constitutional Sunsets and Experimental Legislation: A Comparative Perspective* (Edward Elgar 2014); and ibid, 65.
[255] Mills (n 232).
[256] Martin Fairclough, 'Innovation versus Regulation: Can creativity and safety co-exist?' (RISKworld, Issue 44, Autumn 2023) 10 <https://risktec.tuv.com/wp-content/uploads/2023/12/RISKworld-Newsletter-Issue-44-Autumn-23-WIDESPREAD-1.pdf> accessed 18 June 2024.
[257] Ibid, 11.
[258] Anu Bradford, 'The False Choice Between Digital Regulation and Innovation' (2024) 18(2) Northwestern University Law Review 377, 402-403.
[259] Roberts T et al, 'Credit Scoring Approaches Guidelines' (n 15) XIII.
[260] Mills (n 232).
[261] Bradford, 'The False Choice Between Digital Regulation and Innovation' (n 258) 453.
[262] In the case of financial regulation, see Armour et al (n 184) 13.

necessary for ACS regulation to strike a proportionate balance between the benefits of taking action to reduce existing and potential harm, and the risk of stifling innovation and forsaking future benefit to borrowers.[263] In light of this, an effective regulatory regime for ACS needs to consider the impact of regulation upon future innovation in technology and algorithms, whilst acknowledging the potential regulatory overlap present between the Information Commissioner's Office (ICO) and data protection regulation, for example.[264] Whilst financial regulation is the focus of this thesis, it is necessary to acknowledge overlapping regulatory areas to provide a broader overview of the regulatory landscape surrounding ACS and AI. Overall, whilst it is acknowledged that increased regulation for ACS can improve allocative efficiency and distributional fairness and increase consumer trust, it is crucial that an appropriate balance is struck between preserving the stability of the consumer credit market and the overall financial system, whilst also allowing and encouraging the development of innovation.[265]

3.8 Conclusion

In conclusion, it has been established that the use of ACS can bring significant benefits for borrowers, offering the potential to increase allocative efficiency and distributional fairness outcomes for the provision of consumer credit. However, the underlying challenges which may damage consumer trust in the use of ACS have also been identified. For allocative efficiency, the information asymmetry present between borrowers and lenders has been explored, where addressing this challenge also requires careful consideration as to protecting the proprietary rights of lenders. For distributional fairness, the ongoing debate surrounding addressing the conflict between financial inclusion and financial stability has been discussed where applicable to the use of ACS. Furthermore, the low consumer trust in both the financial services industry and the use of AI more broadly may raise concerns, where this is an issue worsened by the lack of transparency present in black-box algorithms and the potential trade-offs to consumer privacy and autonomy that follow.

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[263] Neil Ross, 'Why innovative regulation is a must for UK tech' (*techUK*, 13 May 2021) <https://www.techuk.org/resource/why-innovative-regulation-is-a-must-for-uk-tech.html> accessed 19 June 2024.

[264] ICO, 'Guidance on AI and data protection' (Updated 15 March 2023) <https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/artificial-intelligence/guidance-on-ai-and-data-protection/> accessed 24 July 2024.

[265] Knut Blind, 'The Impact of Regulation on Innovation' (2012) Nesta Working Paper No. 12/02, 15 <https://media.nesta.org.uk/documents/the_impact_of_regulation_on_innovation.pdf> accessed 23 July 2024.

In response, it is argued that if these risks fail to be addressed, this may culminate in the market failure of the UK's consumer credit market. If these risks were to materialise, this may potentially result in detrimental harm to consumer trust, which must also be weighed up against the potential cost to innovation. Whilst beyond the scope of thesis, it is acknowledged that the financial regulation of ACS overlaps with other areas of the law, such as data protection and privacy. As such, it is acknowledged that the regulatory regime applicable to ACS should keep in mind the importance and difficulties of reconciling these different areas of the law, considering their varying goals and the activities amongst different regulators.

Therefore, it is argued that regulators must carefully consider the need to respond to and regulate the use of ACS moving forwards, with a view to ensuring an appropriate balance between harnessing its potential benefits and mitigating its risks in pursuit of the efficient and fair functioning of the consumer credit market. The next chapter will engage with the ongoing debate surrounding how to regulate ACS, particularly given its heavy use of AI technologies. There, a comparative discussion will be introduced focusing on the contrasting regulatory approaches of the UK and the EU to both ACS and AI. This will set the stage for the final chapter to assess whether reform is necessary to strengthen the UK's regulatory approach to ACS.

Chapter 4: The UK's Regulatory Approach to Algorithmic Credit Scoring

Before analysing the effectiveness of the UK's regulatory approach to ACS in the final chapter, this chapter must first outline the UK's regulatory framework in its current form. Building upon earlier discussion of the benefits, risks and conflicting regulatory goals that may arise, this outline will provide a foundation to assess the regulatory gaps and challenges in the UK's current regulatory approach to ACS.

It is important to note that regulation does not exist in a vacuum, and that the UK's existing regulatory framework for consumer credit also extends to ACS. However, existing rules may prove insufficient for ACS, given the continuous, rapid development of the AI and ML technology in use. This challenge creates a moving target for regulators, resulting in global debate as to whether additional rules are required to regulate ACS.[266]

The broader debate on how to regulate AI has shaped this discourse, marked by the diverging approaches of jurisdictions like the UK and EU.[267] To regulate AI, the UK has adopted a vertical, 'pro-innovation' approach: a light-touch approach where cross-sectoral principles are applied to existing regulatory frameworks, such as the UK's framework for consumer credit.[268] In contrast, the EU has adopted the prescriptive AI Act: horizontal legislation within which ACS is classified as a 'high-risk' AI system.[269] When a system is classified as high-risk, this indicates that the EU have identified it as a system requiring increased regulatory scrutiny to ensure the protection of the health, safety and fundamental rights of borrowers.[270]

To engage with this ongoing debate, the UK's regulatory framework for consumer credit will be outlined first in the context of its application to ACS. Following this, as it is intended to

[266] Noah Greene, 'UK Versus EU: Who Has A Better Policy Approach To AI?' (*Tech Policy Press*, 28 February 2024) <https://www.techpolicy.press/uk-versus-eu-who-has-a-better-policy-approach-to-ai/> accessed 22 July 2024.

[267] Discussion on enforcement falls outside the scope of this thesis, on the basis that the EU's AI Act was only introduced on 1st August 2024 and will not take full effect until two years later on 2nd August 2026. See AI Act (n 9) art 113.

[268] CP 815 (n 11) 2.

[269] AI Act (n 9) annex III, para 5(b) identifies ACS as a 'high-risk' AI system: 'AI systems intended to be used to evaluate the creditworthiness of natural persons or establish their credit score'.

[270] Ibid, recital 1.

build upon existing regulation, the UK's current regulatory approach to AI will then be outlined. This structure will allow for analysis of whether this approach is sufficient to address the limitations of the consumer credit framework in the context of ACS regulation. Furthermore, to assess whether the UK should have opted for an alternative approach to regulation, the EU's regulatory approach to AI and its impact on the regulation of ACS at EU level will be outlined. This comparison will lay the groundwork for a discussion of whether the UK should follow in the EU's footsteps by adopting a horizontal approach to AI where ACS might feature as a high-risk application. This task will be undertaken in the final chapter, which will also make proposals for reform to the UK's current regulatory approach to ACS.

4.1 The UK's Regulatory Framework for Consumer Credit

To begin, it is necessary to outline the UK's existing regulatory framework for consumer credit to establish the foundation to assess whether the UK's regulatory approach sufficiently addresses the risks arising from ACS.[271] To adopt a functional approach to analysis, this framework will focus on the following categories: the role of the FCA, consumer protection, consumer redress and the regulatory overlap with data protection.[272]

4.1.1 *The Role of the Financial Conduct Authority*

Firstly, the Office of Fair Trading (OFT) previously held responsibility for regulating consumer credit in the UK, where regulation was largely statute-based under the Consumer Credit Act (CCA) 1974.[273] However, as the consumer credit sector had evolved significantly since the introduction of the CCA 1974, this regulation was no longer effective, prompting the introduction of a new regulatory regime.[274] Consequently, responsibility for regulating consumer credit was transferred to the FCA in 2014: the UK's new financial services regulator.[275] Under this new framework, the FCA operates primarily under the Financial

[271] This is not an exhaustive list of the existing regulatory framework for consumer credit.
[272] It is acknowledged that these sections overlap, where this structure has been chosen to aid understanding for the reader and to adopt a functional approach to addressing regulation.
[273] Regulatory responsibility was transferred from the OFT to the FCA by the Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No. 2) Order 2013/1881. See also the Consumer Credit Act (CCA) 1974 and all further secondary legislation.
[274] HM Treasury and Department for Business Innovation & Skills, 'A new approach to financial regulation: transferring consumer credit regulation to the Financial Conduct Authority' (2013) 5.
[275] Ibid, 3.

Services and Markets Act (FSMA) 2000,[276] where some retained provisions from the CCA 1974 remain in effect.[277]

A Risk-Based Approach

To regulate consumer credit, the FCA has adopted a proportionate, risk-based regulatory approach. In the context of ACS, this means that risks are prioritised and addressed based on their complexity, size and potential impact, particularly on vulnerable borrowers. In practice, the FCA's approach serves to identify and mitigate the emerging risks arising from the use of ACS within its existing framework for consumer credit, assessing the implications of potential harms on borrowers as consumers, and of the consumer credit market overall.[278]

Furthermore, this approach intends to support the FCA's overarching objective of promoting well-functioning consumer credit markets,[279] focusing on the fair treatment and protection of borrowers as consumers, whilst ensuring that market integrity and competition are not adversely affected.[280] To support the FCA in achieving its objectives and addressing priority risks, the FCA is conferred regulatory powers and functions under the FSMA regime, including the ability to issue rules and guidance.[281] Through adopting these measures, this approach provides the opportunity for regulatory coherence across the consumer credit sector. Additionally, a risk-based approach provides increased flexibility, where the measures issued can be adapted to accommodate changes and growth in the consumer credit sector.[282]

'CONC'

For example, to regulate creditworthiness assessments, the FCA issued guidance through CONC, which requires lenders to undertake a 'reasonable' assessment of the creditworthiness

[276] The FSMA regime refers to the Financial Services and Markets Act (FSMA) 2000 and all further secondary legislation, such as the Financial Services and Markets Act (FSMA) 2023. See also the Financial Services Act 2012 and Financial Services Act 2021 on the framework for financial regulation in the UK.
[277] CCA 1974 (n 273).
[278] Ibid, 10.
[279] Under the FSMA 2000 (n 276), the FCA must discharge its general functions in a way that is compatible with its strategic objective (s 1B(a)), and advances its operational objectives (s 1B(b)), to ensure that the consumer credit market can function well and effectively (s 1F).
[280] Ibid, ss 1C, 1D and 1E; and FCA, 'Guide for consumer credit firms' (2016) 4-5.
[281] Ibid, s 1A. For example, the FCA have general rules (s 137A), and general supplementary powers (s 137T), along with the power to give guidance (s 139A).
[282] HM Treasury, 'Reforming the Consumer Credit Act 1974: Consultation' (2022) 15; and FCA, 'About the FCA' (Updated 26 April 2024) <https://www.fca.org.uk/about/what-we-do/the-fca> accessed 24 August 2024.

of a borrower prior to offering credit.[283] As established in the first chapter, this places an obligation on lenders to assess both credit risk *and* affordability when undertaking a creditworthiness assessment.[284] This is particularly beneficial in the context of ACS, as CONC allows a balance to be struck between the increased accessibility of credit, whilst mitigating the potential risk of over-indebtedness.

4.1.2 *Consumer Protection*

Secondly, consumer protection forms an integral part of the law, where it is crucial to ensure that the interests of borrowers as consumers are protected and prioritised to avoid potentially unfair or harmful outcomes.[285] Therefore, consumer protection must remain at the heart of the FCA's regulatory approach, where measures such as transparency as to market practices and fair access to credit for borrowers are required to ensure that the consumer credit market is able to function effectively and reliably.[286] In the context of consumer credit and ACS, this requires the FCA to operate in a way that secures an appropriate degree of protection for borrowers, where vulnerable borrowers must be protected from potential harm and discriminatory outcomes.[287] The FCA's key provisions in ensuring consumer protection as applicable to ACS will be outlined below.

The Consumer Duty

As a key measure in ensuring consumer protection, the FCA recently introduced the Consumer Duty.[288] This duty applies to ACS on the basis that credit scoring is used in the decision-making process for offering credit to borrowers.[289] In practice, this duty considers the nature and scale of a borrower's vulnerable characteristics in the consumer credit market. Arising from this, an

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[283] FCA, 'CONC' (n 29) 5.2A. This is a regulatory sourcebook which provides an overview of 'reasonable' creditworthiness assessments, see chapter 1. See also the Consumer Credit Instrument 2014, FCA 2014/11 and Consumer Credit (Creditworthiness) Instrument 2018, FCA 2018/44.

[284] Ibid, 5.2A.

[285] Rühl, 'Consumer Protection in Choice of Law' (n 200) 585.

[286] FCA, 'Enhancing market integrity' (Updated 13 December 2023) <https://www.fca.org.uk/about/what-we-do/enhancing-market-integrity> accessed 24 August 2024.

[287] FSMA 2000 (n 276) s 1C.

[288] The Consumer Duty was introduced as Principle 12 of the FCA, 'Principles for Businesses' (Release 39, August 2024), which requires financial firms to 'deliver good outcomes for retail consumers', as issued by the Consumer Duty Instrument 2022, FCA 2022/31, 12.

[289] ACS falls within the scope of the Consumer Duty as it applies to 'all regulated credit-related activities'. See FCA, 'Finalised Guidance: FG22/5 Final non-Handbook Guidance for firms on Consumer Duty' (2022) 8.

obligation is placed on lenders to identify the potential negative impact of ACS on vulnerable groups or individuals if this risk is not effectively monitored.[290]

The Fair Treatment of Vulnerable Borrowers

Additionally, the FCA has issued guidance on the fair treatment of vulnerable borrowers.[291] Typically, the FCA hold the position that borrowers are required to take responsibility for the financial decisions they make, such as partaking in a creditworthiness assessment to seek credit by a lender.[292] However, in the case of vulnerable borrowers, the FCA acknowledge that factors such as limited financial capability and vulnerability may limit the capacity of borrowers in practice.[293] For example, borrowers may be affected by cognitive or physical impairments which may limit their ability to engage effectively with the consumer credit market, as they may be unable to understand the potential risks involved with ACS.[294]

4.1.3 *Redress for Borrowers*

Thirdly, borrowers as consumers may also be able to seek redress. For example, borrowers may be able to complain if the credit provided was unaffordable, on the basis that the lender was irresponsible by extending credit to them in line with a creditworthiness assessment.[295] This avenue for complaint can be taken in line with the FCA's Dispute Resolution Complaints' Sourcebook (DISP),[296] where financial firms, including lenders, are expected to maintain their own complaints handling procedures in a fair and prompt manner.[297] If borrowers feel dissatisfied by the results of a lender's internal investigation, they can (for free of charge) refer to the Financial Ombudsman Service (FOS) for an independent review, where redress can be awarded where appropriate in the circumstances.[298] This is supported by CONC, which places requirements on lenders to assess affordability in a manner that is proportionate.[299] In the

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[290] Ibid, 25.
[291] FCA, 'Finalised guidance: FG21/1' (n 228).
[292] CP 815 (n 11) 28; and FCA, 'Our approach to consumers' (Updated 19 March 2024) <https://www.fca.org.uk/publications/corporate-documents/our-approach-consumers> accessed 24 August 2024.
[293] Ibid, 28.
[294] Ibid, 28.
[295] Financial Ombudsman Service (FOS), 'Unaffordable lending' (Updated 23 December 2022) <https://www.financial-ombudsman.org.uk/businesses/complaints-deal/consumer-credit/unaffordable-lending> accessed 30 August 2024.
[296] FCA, 'AI Update' (2024) 18; and FCA, 'Dispute resolution: Complaints' (Release 37, June 2024) ch 1.
[297] Ibid, 16.
[298] Ibid, 18.
[299] FCA, 'CONC' (n 29) 5.2A.

context of ACS, the redress is likely to be to put the borrower in the position they would be in if the agreement was never formed or if the problem had never happened.[300]

4.1.4 *Regulatory Overlap with Data Protection*

Finally, whilst financial regulation is the focus of this thesis, it must be briefly acknowledged that the regulation of ACS overlaps into the regulatory scope of other areas. Notably, ACS concerns data protection regulation in relation to the processing and use of personal data, for example.[301] To provide a brief overview, the Information Commissioner's Office (ICO) holds responsibility for regulating data protection under the UK General Data Protection Regulations (UK GDPR) and Data Protection Act (DPA) 2018.[302] Additionally, in relation to discriminatory outcomes, there is also regulatory overlap with the Equality and Human Rights Commission,[303] based on discrimination arising from protected characteristics under the Equality Act (EA) 2010.[304] This regulatory overlap has been identified in the previous chapter, and will be discussed in the context of automated decision-making, discriminatory outcomes and bias, and protecting the rights of borrowers in relation to the processing of personal data.[305]

Automated Decision-Making

Under data protection regulation, automated decision-making is regulated under Article 22 of the UK GDPR, where it is defined as reaching a decision through automated means, based on both inferred and factual data, without any human involvement.[306] ACS falls under the scope

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[300] FCA, 'Dispute resolution: Complaints' (n 296).

[301] FCA, 'AI Update' (n 296) 15; and ICO, 'Credit' (n 18).

[302] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (GDPR) [2016] OJ L119/1 was retained in domestic law through the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (United Kingdom General Data Protection Regulation) (UK GDPR) which sits alongside an amended version of the Data Protection Act (DPA) 2018. See also ICO, 'The UK GDPR' <https://ico.org.uk/for-organisations/data-protection-and-the-eu/data-protection-and-the-eu-in-detail/the-uk-gdpr/> accessed 30 August 2024.

[303] FCA, 'AI Update' (n 296) 15.

[304] Equality Act (EA) 2010.

[305] This is not a comprehensive outline of the UK's data protection regulatory framework, where instead the key provisions relating to ACS have been identified.

[306] UK GDPR (n 302) art 22; and ICO, 'What is automated individual decision-making and profiling?' <https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/individual-rights/automated-decision-making-and-profiling/what-is-automated-individual-decision-making-and-profiling/#id2> accessed 22 August 2024.

of this definition, on the basis that the credit score calculated can influence the likelihood of a borrower's access to credit.[307]

Article 22(1) further specifies that automated decisions which produce 'legal' (such as impacting the rights or status of an individual) or 'similarly significant' effects (such as holding an equivalent impact on an individual's circumstances, choices or behaviour) must be regulated, where borrowers (as data subjects) have the right to object to and not to be subject to automated decisions.[308] For an example for ACS, a black-box algorithm could result in an automatic refusal of credit, yet the decision may be unable to be reviewed or explained; thereby producing a similarly significant effect by causing detriment to a borrower's financial position.

Furthermore, automated decision-making is permitted in the case of ACS under Article 22(2)(a) on the basis that it is necessary for entering into a credit agreement, as the lender is able to increase the efficiency of the credit scoring process by making use of increased alternative data.[309] Therefore, data protection regulation can currently provide some degree of regulatory protection for ACS through its regulation for automated decision-making.

Bias and Discrimination

In relation to bias and discrimination, Article 22(4) also provides additional protection for 'special category' personal data,[310] such as sensitive, personal data revealing race or ethnic origin.[311] This means that automated decisions cannot be based on special category personal

[307] Ibid; and Bryce Goodman and Seth Flaxman, 'European Union regulations on algorithmic decision-making and a "right to explanation"' (2017) 38(3) AI Magazine 50, 51.

[308] UK GDPR (n 302) art 22(1) and recital 71; and FCA, 'AI Update' (n 296) 18; and Article 29 Data Protection Working Party, 'Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679 (WP251rev.01)' 17/EN (2018).

[309] Ibid, art 22(2); and Fieldfisher, 'Artificial Intelligence and automated individual decision making, including profiling, under Art. 22 GDPR' (30 June 2023) <https://www.fieldfisher.com/en/insights/artificial-intelligence-and-automated-individual-decision-making> accessed 30 August 2024.

[310] Ibid, art 22(4); and ICO, 'When can we carry out this type of processing?' <https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/individual-rights/automated-decision-making-and-profiling/when-can-we-carry-out-this-type-of-processing/> accessed 22 August 2024.

[311] To lawfully process special category data, a lawful basis must be identified under ibid, art 6, and a separate condition for processing under art 9. See also DPA 2018 (n 302) sch 1; and ICO, 'Special category data' <https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/lawful-basis/a-guide-to-lawful-basis/lawful-basis-for-processing/special-category-data/> accessed 24 August 2024.

data under the scope of Article 9 *unless* the data subject has explicitly consented, or the processing is necessary for 'reasons of substantial public interest'.[312]

Under the EA 2010, discrimination is prohibited, which places an obligation on lenders not to actively disadvantage borrowers based on their protected characteristics.[313] Discrimination can take two forms under the EA 2010 (as either direct discrimination or indirect discrimination)[314] and it refers to the following protected characteristics: age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion, sex or sexual orientation.[315]

The Rights of Borrowers in the Processing of Personal Data

To address these concerns of discrimination, the UK GDPR expands the rights of borrowers in relation to the processing of their personal data, providing strict obligations for compliance to ensure the protection of borrowers as data subjects.[316] The relevant provisions will be set out as follows. Primarily, a 'right to explanation' is offered under Articles 13, 14 and 15, which requires that meaningful information must be provided to borrowers about the logic behind automated decision-making to ensure transparency.[317] Article 5 extends this obligation by mandating that personal data must be processed in a lawful, fair, and transparent manner, which involves accuracy, data minimisation and purpose limitation to mitigate the potential discrimination and unfair treatment of borrowers through ACS.[318] Furthermore, as automated decision-making and processing are considered to be high-risk, the UK GDPR also requires a 'Data Protection Impact Assessment' to be carried out under Article 35, with the purpose of

[312] UK GDPR (n 302) arts 22(4) and 9(1); and Fieldfisher (n 309).

[313] EA 2010 (n 299); and Simon Greaves, 'The FCA Consumer Duty: algorithmic bias and discrimination' (*BDO*, 4 October 2022) <https://www.bdo.co.uk/en-gb/insights/industries/financial-services/the-fca-consumer-duty-algorithmic-bias-and-discrimination> accessed 24 August 2024.

[314] Ibid, s 13, where direct discrimination is defined as where 'a person (A) discriminates against another (B) if, because of a protected characteristic, A treats B less favourably than A treats or would treat others'; and s19, where indirect discrimination is defined as where 'a person (A) discriminates against another (B) if A applies to B a provision, criterion or practice which is discriminatory in relation to a relevant protected characteristic of B's'.

[315] Ibid, ss 4-12.

[316] Fieldfisher (n 309); and Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

[317] UK GDPR (n 302) arts 13(2)(f), 14(2)(g), and 15(1)(h); and FCA, 'AI Update' (n 296) 16; and ICO, 'Right to be informed' <https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/individual-rights/individual-rights/right-to-be-informed/> accessed 30 August 2024.

[318] Ibid, art 5; and Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

demonstrating that a lender has identified and assessed the risks involved and how these risks will be addressed.[319]

Whilst it has been acknowledged that financial regulation is the focus of this thesis, outlining these regulatory mechanisms under data protection regulation provides a broader overview of the applicable regulatory framework for ACS.

4.2 The UK's 'Pro-Innovation' Approach to AI

Given ACS's significant reliance on AI, a comprehensive analysis of the UK's regulatory approach must also consider whether, and to what extent, new AI principles and rules might have an impact on ACS regulation. In this regard, it is worth noting that the UK has adopted a non-statutory, 'pro-innovation' approach to the regulation of AI, which is vertical and sector-specific, building on top of existing regulation through the application of cross-sectoral principles.[320] This approach focuses on regulating the use of AI over the technology itself, aiming to encourage innovation whilst maintaining flexibility to effectively address the risks arising from ACS. To facilitate discussion as to the effectiveness of the UK's regulatory approach in the final chapter, the key aims and elements of AI regulation must first be explored, where each cross-sectoral principle will be applied in the context of ACS.

4.2.1 *Key Aims*

Consumer Trust

Firstly, the UK's regulatory approach aims to encourage consumer trust in the use of AI, by adopting a clear, proportionate approach to regulation.[321] The purpose of this approach is to allow for flexibility and encourage innovation, with the intention of building consumer trust through regulation to encourage the widespread adoption of ACS.[322] This is a crucial aim, where low trust may have an opposite effect by resulting in reluctance to use AI, which

[319] Ibid, art 35(3)(a); and ICO, 'What else do we need to consider if Article 22 applies?' <https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/individual-rights/automated-decision-making-and-profiling/what-else-do-we-need-to-consider-if-article-22-applies/#id1> accessed 30 August 2024.
[320] CP 815 (n 11) 5.
[321] Ibid, 5; and Patrick Vallance, Priya Lakhani and Matt Clifford, 'Pro-innovation Regulation of Technologies Review: Digital Technologies' (HM Government 2023).
[322] Ibid, 18; and Eric Bentzen, Åke Freij and Claus J. Varnes, 'The Role of Flexibility and Complexity in Response to Regulatory Change: A Case Study of Innovation in a Major Danish Financial Institution' (2021) 22(4) The International Entrepreneurship and Management Journal 229, 235.

ultimately hinders innovation.[323] Therefore, the UK's sector-specific, principles-based approach purposefully reflects this aim, by ensuring that the regulatory action taken is proportionate to the context and outcomes from the specific use of AI, rather than focusing on the technology itself.

Growth and Prosperity

Secondly, the UK has prioritised the need to drive growth and prosperity by facilitating responsible innovation and reducing regulatory uncertainty. This aim focuses on encouraging innovation and investment in AI, which will support its overall adoption throughout the UK economy to create jobs and increase efficiency. By removing existing barriers to innovation and preventing further barriers from emerging, this will allow the UK government to capitalise on early development successes, which can aid in securing a long-term market advantage nationally and globally. Overall, this aim focuses on supporting AI innovators, by simplifying regulatory complexity whilst identifying opportunities for improvement to the framework, ensuring that it remains clear whilst being cross-cutting, adaptable and trustworthy.[324]

Global Leadership in AI

Thirdly, this approach aims to strengthen the UK's position as a global leader in AI.[325] The UK government believe that AI has the potential to address global challenges, ranging from future pandemics to climate change, whilst recognising that to do so AI requires new regulatory responses to successfully guide responsible innovation.[326] Through its principles-based approach, the UK aims to shape international governance and regulation by leading the global conversation. To achieve this aim, the UK proposes to work closely with global partners such as the EU, to learn, adapt and influence their approach to AI to solidify their position as a global leader. In addition, this approach has been taken until there is a greater, matured understanding of the potential risks of the use of AI, and to ensure that this accounts for the technology yet to be both developed and understood.[327]

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[323] Ibid, 17.
[324] Ibid, 41.
[325] Ibid, 18.
[326] Ibid, 18.
[327] Herbert Smith Freehills, 'Regulating AI: Two steps forward for the UK as pro-innovation approach remains' (7 February 2024) <https://www.herbertsmithfreehills.com/notes/ip/2024-02/regulating-ai-two-steps-forward-for-the-uk-as-pro-innovation-approach-remains> accessed 25 July 2024; and Prime Minister's Office, 10 Downing Street and The Rt Hon Rishi Sunak MP, 'Prime Minister's speech on AI: 26 October 2023' (Speech at

Overall, the UK's regulatory approach aims to strike an appropriate balance between responding to risk and maximising opportunity, striving to be context-sensitive, adaptable and proportionate to ensure the benefits of AI do not outweigh its risks.[328] To determine whether this approach achieves its aims and establishes effective regulation for ACS in the final chapter, the UK's principles-based approach to AI will now be applied to its existing regulatory framework for consumer credit.

4.2.2 *Key Elements*

The UK's approach to AI builds upon its regulatory framework for consumer credit, where the cross-sectoral principles established shape the overall regulatory approach to ACS in the UK. Before assessing whether the UK's approach to regulation is sufficient to harness the benefits of ACS whilst effectively managing its risks, these key elements and cross-sectoral principles will be applied in the context of ACS.

Definition of AI

Firstly, the regime opts for no formal definition of AI, with the aim of guiding interpretation to support regulatory coordination amongst sectors.[329] Instead, AI systems are loosely defined based on the functional characteristics of 'adaptivity'[330] and 'autonomy'.[331] This combination of characteristics identifies the difficulty in allocating responsibility for the outputs generated, where the underlying logic and justification behind the decision reached often cannot be predicted, explained or controlled.[332] To provide an example in the context of ACS, this definition is beneficial when considering the use of black-box algorithms as these functional characteristics recognise the need for algorithmic responsibility.

The Royal Society on 26 October 2023) <https://www.gov.uk/government/speeches/prime-ministers-speech-on-ai-26-october-2023> accessed 22 July 2024.

[328] CP 815 (n 11) 65.

[329] Ibid, 20; and Anne-Gabrielle Haie et al, 'A Comparative Analysis of the EU, US and UK Approaches to AI Regulation' (*StepToe*, 30 April 2024) <https://www.steptoe.com/en/news-publications/steptechtoe-blog/a-comparative-analysis-of-the-eu-us-and-uk-approaches-to-ai-regulation.html> accessed 22 July 2024.

[330] Difficulty to explain the outcomes and functions can differ to what is expected; see ibid, 20.

[331] Difficulty in assigning responsibility for the outcomes reached; see ibid, 20.

[332] Ibid, 20.

By defining AI in alignment with these functional characteristics, the UK's approach provides scope to 'future-proof' its framework.[333] This means that this regulatory framework is designed to be flexible to ensure that it does not become outdated or restrictive to the rapid evolution of AI. Additionally, these characteristics are 'technology-neutral'; providing no mandate or prohibition for specific technologies.[334] This will allow scope for the future development of ACS within its regulatory approach, rather than risking stifling innovation by being too prescriptive early on.

A Sector-Specific Approach

Secondly, a sector-specific approach has been adopted, based on the outcomes that AI is likely to generate in the context of its applications.[335] For example, based on the amplified risk of discrimination to borrowers, the UK has identified creditworthiness assessments using ACS as a high-level risk which requires priority and mitigation through proportionate regulatory intervention.[336] Therefore, the UK has opted for a self-regulatory model, building instead on existing sectoral regulation and requiring regulators to take active steps in line with the framework.[337] Given that the regulation of consumer credit already falls within the regulatory scope of the FCA, the adoption of a sector-specific approach appears beneficial as the FCA are arguably the best placed to analyse any specific risks emerging within the scope of their expertise.

In practice, this sector-specific approach has involved utilising soft-law measures such as issuing voluntary standards and guidelines, meaning that lenders are encouraged to follow this guidance, but currently have no legal obligation to do so.[338] Therefore, whilst this sector-specific approach is beneficial in theory, the issuing of voluntary guidance remains illustrative and is not prescriptive, where lenders may not comply.[339] Despite this potential limitation, the

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[333] Ibid, 20; and DSIT, OAI and Centre for Data Ethics and Innovation (CDEI), 'A guide to using artificial intelligence in the public sector' (Updated 18 October 2019) <https://www.gov.uk/government/collections/a-guide-to-using-artificial-intelligence-in-the-public-sector> accessed 23 July 2024.

[334] Bank of England and FCA, 'Discussion Paper DP5/22' (n 185) 16.

[335] CP 815 (n 11) 23.

[336] Ibid, 10-11.

[337] Philipp Hacker, 'AI Regulation in Europe: From the AI Act to Future Regulatory Challenges' (6 October 2023) 3 <https://arxiv.org/ftp/arxiv/papers/2310/2310.04072.pdf> accessed 23 July 2024; and DSIT, *A pro-innovation approach to AI regulation: government response* (CP 1019, 2024).

[338] Ibid, 3; and DSIT, 'Implementing the UK's AI Regulatory Principles: Initial Guidance for Regulators' (2024) 7-8.

[339] FCA, 'Understanding consumer credit' (n 32) 3.

flexibility of a non-statutory, sector-specific approach is beneficial, as it allows the UK to adapt its regulatory framework as is necessary to respond to societal needs and technological developments.[340] This approach will be considered further through the below five principles.

4.2.3 *Establishing Cross-Sectoral Principles*

Thirdly, five cross-sectoral principles have been established,[341] which are to be implemented and led by existing regulators to facilitate regulation that fits various sectoral contexts and complies with existing frameworks to ensure clarity.[342] The principles are as follows: safety, security and robustness, appropriate transparency and explainability, fairness, accountability and governance, and contestability and redress.[343] Each principle will be considered below in the context of ACS, where the FCA hold regulatory responsibility for implementing the framework.

Safety, Security and Robustness

The first principle of 'safety, security and robustness' requires continuous assessment, identification and management of risk of ACS, where regulators are encouraged to issue guidance to ensure AI systems are technically secure and can function reliably and as intended.[344] In the context of ACS, this principle places an increased obligation on lenders to ensure that the algorithms used are explainable and transparent, particularly when there is an increased use of alternative data. For example, by providing guidance for lenders on undertaking a 'reasonable' creditworthiness assessment through CONC, this allows for the protection of borrowers in relation to black-box algorithms, where lenders are required to ensure these algorithms can function reliably and must explain the outcomes.[345] To demonstrate compliance, the FCA highlighted its Principles, where examples of its guidance include requiring lenders to conduct their business with 'due skill, care and diligence' under Principle

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[340] Sarah Pearce, 'Regulating AI in the EU and the UK – a legal view' (*The Foundation for Science and Technology*, 21 February 2024) <https://www.foundation.org.uk/Blog/2024/Regulating-AI-in-the-EU-and-the-UK-a-legal-view> accessed 30 August 2024.

[341] These principles are 'values-based' and designed to promote the ethical use of AI, reflected by the Organisation for Economic Co-operation and Development's AI Principles. See ibid, 23; Organisation for Economic Co-operation and Development (OECD), 'Recommendation of the Council on Artificial Intelligence' OECD/LEGAL/0449 (2024); and OECD, 'OECD AI Principles overview' (Updated May 2024) <https://oecd.ai/en/ai-principles> accessed 23 July 2024.

[342] CP 815 (n 11) 23-27; and Haie et al (n 329).

[343] Ibid, 5.

[344] Ibid, 24-25; and FCA, 'AI Update' (n 296) 11.

[345] FCA, 'CONC' (n 29) 5.2A.

2.[346] However, as this guidance remains a soft-law measure, it is to be reminded that this measure remains illustrative and is not prescriptive, where lenders may not comply.

Appropriate Transparency and Explainability

The second principle of 'appropriate transparency and explainability' has two elements.[347] First, when considering what is appropriate, this requires the appropriate information about the AI system to be conveyed to the relevant people to encourage consumer trust in the use of AI.[348] For example in the case of ACS, this could be the provision of information as to 'how, when and what' the AI system is used for, such as conveying to borrowers what the purpose of the AI system is for.[349] Second, when discussing explainability, this refers to the extent and possibility for the relevant parties to be able to 'access, interpret and understand' how the AI system reaches a decision, whilst acknowledging that borrowers may require different information to regulators.[350]

In practice, this is likely to place a requirement upon regulators to provide guidance and establish technical standards, where there is a need for this information to be tailored to address the use of ACS specifically. Whilst the FCA acknowledge that ACS is not directly or specifically addressed in their existing regulatory framework, compliance with this principle can be demonstrated by their existing requirements in place under their approach to consumer protection.[351] For example, the FCA's Consumer Duty places an obligation on lenders to identify the potential negative impact on vulnerable borrowers in relation to ACS.[352] This is important when considering the use of black-box algorithms in ACS, where if their use is not effectively monitored by lenders, borrowers risk facing harm through algorithmic bias, for example. This can be particularly useful, where this duty requires active steps from lenders to monitor and mitigate the potential risks that borrowers may face.[353] By requiring lenders to

[346] FCA, 'AI Update' (n 296) 11; and FCA, 'Principles for Businesses' (n 288) PRIN 2/2.
[347] CP 815 (n 11) 25; adapted from IEEE Standards Association, 'IEEE Standard for Transparency of Autonomous Systems' IEEE 7001-2021 (2022).
[348] Ibid, 25-26.
[349] Ibid, 26.
[350] Ibid, 25.
[351] FCA, 'AI Update' (n 296) 16.
[352] FCA, 'Finalised Guidance: FG22/5' (n 289) 8 and 25; and FCA 2022/31 (n 288).
[353] Angus Goldie and Martin Hislop, 'Consumer duty: Raising the bar on consumer outcomes' (*PwC*) <https://www.pwc.co.uk/industries/financial-services/understanding-regulatory-developments/fca-proposes-new-consumer-duty-in-paradigm-shift-for-firms.html> accessed 19 August 2024.

monitor the potential harm faced by vulnerable borrowers, this is a positive step in the regulation of ACS by placing an obligation on lenders to deliver a higher standard of care and protection to borrowers.

Fairness

The third principle of 'fairness' requires regulators to outline exactly *how* AI systems used in their regulatory domain aligns with the relevant laws and regulation surrounding areas such as: consumer protection, protection of vulnerable consumers and data protection.[354] Finally, the 'relevant sector-specific fairness requirements' must be considered, such as the FCA Handbook.[355] When considering the fair and safe use of AI, the FCA's regulatory approach to consumer protection is relevant, where the FCA emphasises its role in issuing guidance such as the Consumer Duty.[356] As an example, the FCA outlines how ACS should not reduce a borrower's access to credit, and where lenders use ACS and this runs the risk of amplifying bias or creating a worse outcome for minority vulnerable groups, this may be a contravention of acting in good faith (unless the different outcome could be justified objectively).[357] Therefore, the FCA have emphasised that there must be a clear line drawn when considering how ACS is used in relation to credit risk, as unfairness may result in individuals becoming excluded from the market dependent on their individual circumstances or other risk factors.[358]

Additionally, the FCA's guidance on the fair treatment of vulnerable borrowers is both outcomes-focused and technology-agnostic, extending to the use of ACS and of data across financial services.[359] This guidance is a useful tool to mitigate the potential harm and disproportionate impact arising from the use of ACS, by placing an expectation on lenders to account for vulnerable borrowers at all stages of the process and design of the algorithm.[360]

Accountability and Governance

The fourth principle of 'accountability and governance' governs the effective oversight of the 'supply and use' of AI systems, aiming to draw lines of accountability clearly and to establish

[354] CP 815 (n 11) 27.
[355] Ibid, 28; and FCA, 'CONC' (n 29).
[356] FCA, 'AI Update' (n 296) 13.
[357] FCA, 'PS22/9: A new Consumer Duty: Feedback to CP21/36 and final rules' (2022).
[358] FCA, 'AI Update' (n 296) 14.
[359] FCA, 'PS22/9' (n 357) 3.
[360] FCA, 'AI Update' (n 296) 14.

expectations for good practice with regulatory compliance.[361] This principle is on the basis that AI systems operate with a 'high level of autonomy': producing potentially unforeseen outcomes which require clear and appropriate guidelines to be established in relation to accountability and ownership to establish certainty and ensure regulatory compliance.[362] To meet this principle, the FCA rely on their existing framework of rules and guidance as relevant to the safety and accountability arrangements required of lenders, such as the requirement of management and control under Principle 3 of its Principles.[363] For example, by issuing assurance techniques such as impact assessments, this is expected to help to identify potential risks early on, allowing regulatory guidance to be reflective of the responsibilities of AI systems throughout their entire lifecycle.[364] However, due to the rapid developments of AI and ML technology, a risk emerges where regulators may need to continuously refine their regulatory approach.[365]

Furthermore, despite its existing functions, rules and disciplinary powers, the FCA have been granted no new regulatory powers or funding to support them when addressing the potential challenges that ACS brings.[366] This runs the risk of worsening existing issues as by adopting a non-statutory framework and issuing no new statutory powers, regulators may be insufficiently equipped or lack the appropriate resources to deal with existing or emerging risks.[367] Overall, whilst there are clear benefits to this approach as identified throughout, ambiguity arises as to how this new sectoral approach will work in practice, which casts considerable doubt on the effectiveness of the UK's pro-innovation approach to AI.

Contestability and Redress

The fifth and final principle of 'contestability and redress' requires regulators to identify and clarify routes for borrowers to contest decisions and seek redress, with the aim of making this

[361] CP 815 (n 11) 28.
[362] Ibid, 28.
[363] FCA, 'AI Update' (n 296) 16; and FCA, 'Principles for Businesses' (n 288) PRIN 2/2.
[364] CP 815 (n 11) 29.
[365] Vallance, Lakhani and Clifford (n 321) 6.
[366] The FCA's general functions are outlined under FSMA 2000 (n 276) s 1B(6)(a)-(d). The FCA also have the power to issue rules of conduct (s 64A), issue general rules (s 137A), have general supplementary powers (s 137T) and the power to issue guidance (s 139A).
[367] Huw Roberts, 'AI in the EU and UK: two approaches to regulation and international leadership' (*UK in a Changing Europe*, 26 June 2023) <https://ukandeu.ac.uk/ai-in-the-eu-and-uk-two-approaches-to-regulation-and-international-leadership/> accessed 22 July 2024.

process easily available and accessible for all borrowers as consumers.[368] The rationale behind this is of different harms and material impact which requires clear guidance.[369] As outlined in the third chapter, the FCA outlines the current route to redress as initially complaining to the lender directly in line with the DISP, and if the borrower is dissatisfied with the results of this investigation, they may refer the matter to the FOS.[370] However, it is worth noting that the UK's initial approach to AI does not establish new rights or routes to redress for borrowers when ACS is used.[371]

4.2.4 *Encouraging Coherency in Regulation*

Finally, this approach introduces new central functions to support regulators in delivering this framework and encourage a coherent approach to the regulation of AI.[372] To do so, the UK's approach aims to maintain and develop a framework for central monitoring and evaluation, which will aid the government in assessing the effectiveness of the new framework by assessing the cross-economy and sector-specific impacts.[373] By issuing and updating central regulatory guidance, it is hoped that this can be useful in supporting the implementation of these principles and identifying the barriers that may prevent regulators from efficiently implementing them. In practice, the framework aims to increase consumer education and awareness to ensure that borrowers are aware of the benefits and risks that may emerge when AI and ACS are used.[374]

However, there are significant differences between the powers of regulators, including the extent to which regulators have started to address AI.[375] On this point, it is worth noting that, although beyond the scope of this thesis, there is regulatory overlap present in addressing ACS; most notably the overlap between financial regulation and data protection regulation as identified above. Furthermore, due to the rapid developments of AI technology, there is a risk that regulators may need to continuously refine their regulatory approach, which runs the risk of worsening this problem.[376] In response, it is necessary to ensure that the UK's pro-innovation

[368] CP 815 (n 11) 29.
[369] Ibid, 29.
[370] FCA, 'AI Update' (n 296) 18; and FCA, 'Dispute resolution: Complaints' (n 296) ch 1.
[371] CP 815 (n 11) 29-30.
[372] FCA, 'AI Update' (n 296) 19.
[373] CP 815 (n 11) 38-39.
[374] Ibid, 42.
[375] Vallance, Lakhani and Clifford (n 321) 6; and CP 525 (n 239).
[376] Ibid, 6.

framework is sufficiently adaptable and future-proof, alongside placing heavy responsibility on the collaboration between regulators, the government and each sector to ensure that innovation is not compromised.[377]

4.3 The Alternative Approach of the EU

It is worth pointing out that, alike to the UK, ACS is also regulated at EU level in a very similar manner.[378] This can be attributed to the fact that both pre-existing financial regulation in the UK and EU are largely similar, where EU financial regulation was harmonised pre-Brexit and has not significantly diverged since. However, the EU has adopted a specialised AI regulation that classifies ACS as 'high-risk',[379] offering avenues of discussion into whether the UK's regulatory approach would have benefited from being more similarly to the EU's. This discussion will be explored in the final chapter to determine the suitability of an alternative approach. To facilitate this discussion as to whether the UK should adopt legislative reform and follow in the EU's footsteps, the AI Act will be outlined as it applies to ACS.

4.3.1 *The AI Act*

The EU has chosen to adopt prescriptive legislation tailored to AI through the AI Act, which recently entered into force on 1st August 2024, where it will take full effect two years later on 2nd August 2026.[380] This Act is both top-down and horizontal, meaning that the EU have decided to establish statutory rules to regulate AI in a harmonised way across all 27 Member States by applying blanket rules to *all* sectors.[381] Leading the way forward in the regulation of AI, the AI Act has sparked widespread debate across the legal sector as the 'first comprehensive horizontal legal framework' to address and regulate AI.[382] This prescriptive approach to regulation classifies ACS as a 'high-risk' application, requiring increased regulatory scrutiny to ensure the protection of health, safety and fundamental rights.[383] To determine whether the

[377] CP 815 (n 11) 15.
[378] The regulation of consumer credit in the EU is beyond the scope of this thesis.
[379] AI Act (n 9) annex III, para 5(b) identifies ACS as a 'high-risk' AI system: 'AI systems intended to be used to evaluate the creditworthiness of natural persons or establish their credit score'.
[380] Ibid, art 113; and European Commission, 'European Artificial Intelligence Act comes into force' (1 August 2024) <https://ec.europa.eu/commission/presscorner/detail/en/IP_24_4123> accessed 7 August 2024.
[381] Haie et al (n 329).
[382] Tim Hickman et al, 'Long awaited AI Act becomes law after publication in the EU's Official Journal' (*White & Case*, 16 July 2024) <https://www.whitecase.com/insight-alert/long-awaited-eu-ai-act-becomes-law-after-publication-eus-official-journal> accessed 12 August 2024.
[383] AI Act (n 9) annex III, para 5(b).

UK should follow in their footsteps, this thesis will discuss whether the EU's decision to adopt prescriptive legislation more suitably allows for addressing the risks of ACS (while still harnessing its benefits). To facilitate this discussion, the aims, scope and key elements of the AI Act will be outlined below applicable to ACS.[384]

4.3.2 *Key Aims*

Human-Centric and Trustworthy AI

Firstly, the EU aims to encourage the uptake of 'human-centric' and trustworthy AI; opting for a risk-based approach to regulation to allow AI to be used as a beneficial tool with the 'ultimate aim of increasing human well-being'.[385] This is in response to the need to ensure a high degree of protection for the public interest, specifically for health, safety, and fundamental rights.[386] The EU acknowledges the key competitive advantages of using AI, given that AI is rapidly evolving and has great economic and societal benefits across sectors.[387] However, the potential risks and harm that AI might cause are also recognised, where depending on the circumstances of its specific use, application and level of technological development, there may be increased risk of AI causing harm to the public interests and fundamental rights protected by EU law.[388]

A Harmonised Legal Framework

Secondly, the EU aims to adopt prescriptive legislation by establishing a harmonised legal framework, rather than allowing for diverging approaches across Member States, with the purpose of improving the functioning of the internal market by reducing fragmentation in approach and increasing legal certainty.[389] To summarise, the EU's decision to adopt prescriptive legislation aims to allow their approach to be both 'clear and robust' in addressing

[384] Chapter 5 will compare the efficiency of this framework in greater depth.

[385] Ibid, recitals 1 and 6; and Hacker (n 337) 3.

[386] Ibid, recital 1. See the Charter of Fundamental Rights of the European Union (Charter) [2012] OJ C326/391, where fundamental rights such as the right to human dignity (art 1), respect for private life and protection of personal data (arts 7 and 8), non-discrimination (art 21), etc. must be protected from the use of AI; as discussed in European Commission, 'Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts' COM (2021) 206 final, para 3.5.

[387] Ibid, recital 4.

[388] Ibid, recital 5. In considering the potential harm, the EU recognises that 'such harm might be material or immaterial, including physical, psychological, societal or economic harm'.

[389] Ibid, recital 3; and Jonas Schuett, 'Risk Management in the Artificial Intelligence Act' (2023) European Journal of Risk Regulation 1 <https://doi.org/10.1017/err.2023.1> accessed 11 August 2024) 5.

the potential risks and harm that AI might bring, whilst providing scope to be supportive of new innovations to gain advantages from its use.[390]

Global Leadership in AI

Thirdly, it is hoped by the EU that by establishing uniform obligations to protect the public interest and individuals rights,[391] the EU will be able to position itself as a global leader in addressing AI.[392] This desire stems from how the EU has often been seen as a legal powerhouse, where the EU's GDPR is a good illustration of the so-called 'Brussels Effect',[393] whereby non-EU countries not bound by the GDPR nevertheless ended up adapting similar frameworks in their own jurisdictions.[394] Therefore, there is a possibility that the AI Act may act as a benchmark for other jurisdictions to follow in its footsteps, taking the lead of the approach for international governance of AI.

4.3.3 *Key Elements*

To pursue these aims, the AI Act contains a number of key elements and principles that make up its regulatory approach to ACS, which will be discussed further below.

Definition of AI

Firstly, the AI Act offers a technology-neutral definition, where Article 3(1) defines an AI system as: '*a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives,*

[390] Ibid, recitals 1 and 8; in accordance with the Consolidated Version of the Treaty on the Functioning of the European Union [2012] C 326/47, art 114; and European Commission, 'A European approach to artificial intelligence' (19 June 2023) <https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence> accessed 11 August 2024.

[391] Ibid, recitals 3 and 6. Given the potential societal impact of AI and the need to build trust, the regulatory framework must be in line with arts 2 and 6 of the Consolidated Version of the Treaty on European Union [2012] C 326/13 and the fundamental rights in line with the Charter (n 386).

[392] Ibid, recital 2; and European Commission, 'White Paper on Artificial Intelligence – A European approach to excellence and trust' (2020) COM (2020) 65 final, 6.

[393] To amount to the 'Brussels Effect', five elements must be satisfied: 'market size, regulatory capacity, stringent standards, inelastic targets, and non-divisibility'. See more at Anu Bradford, *The Brussels Effect: How the European Union Rules the* World (OUP 2020) 25-26.

[394] GDPR (n 302); and 'Europe, a laggard in AI, seizes the lead in its regulation' *The Economist* (Berlin, updated 12 December 2023) <https://www.economist.com/europe/2023/12/10/europe-a-laggard-in-ai-seizes-the-lead-in-its-regulation> accessed 24 July 2024.

infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments'.[395]

This definition has two key elements that must be emphasised: the use of 'infers' and 'autonomy'.[396] This language allows for clearer differentiation between AI systems and 'other software where the output is pre-determined (if x then y) by a strict algorithm', which is beneficial as this definition focuses on the key characteristics of AI systems, allowing for wider scope for this technology.[397] However, concerns remain as to whether this definition is too wide, which could result in legal uncertainty surrounding what is classified as AI, and could risk stifling innovation if simpler, lower-risk AI models were captured by this definition.[398]

Additionally, it is worth noting that the EU have refined their final definition of AI, opting for a broader definition to ensure that there is sufficient flexibility to accommodate for arising technological developments.[399] Initially, the EU's definition of AI was technology-specific, outlining an established list of AI technologies and methods, which risked damaging the future-proof capability of the AI Act moving forwards.[400] The issue of adopting a technology-specific definition is that such definitions can quickly become obsolete, which in turn can limit future innovation and adoption of AI and would require constant amendments.[401] Therefore, by refining their approach and definition to become technology-neutral, it is hoped that this will allow the AI Act to achieve its aims whilst providing scope for the adoption of future AI developments moving forwards.

Classification of Risk

Secondly, the AI Act opts for a proportionate, risk-based approach to regulation, where AI systems are categorised and classified depending on the intensity and the risk level posed to

[395] AI Act (n 9) art 3(1).
[396] Ibid, art 3(1).
[397] Frederiek Fernhout and Thibau Duquin, 'The EU Artificial Intelligence Act: our 16 key takeaways' (*Stibbe*, 13 February 2024) <https://www.stibbe.com/publications-and-insights/the-eu-artificial-intelligence-act-our-16-key-takeaways> accessed 14 August 2024.
[398] Tamlin Higgins, Robin Jackson and Pepijn Korten, 'The EU AI Act: concerns and criticism' (*Clifford Chance*, 6 April 2023) <https://www.cliffordchance.com/insights/resources/blogs/talking-tech/en/articles/2023/04/the-eu-ai-act--concerns-and-criticism.html> accessed 14 August 2024.
[399] AI Act (n 9) recital 12; and ibid.
[400] See the original definition at COM (2021) 206 final (n 386). See also ibid, art 3(1) and annex I; and Fernhout and Duquin (n 397).
[401] Patrick Grady, 'The AI Act Should Be Technology-Neutral' (Center For Data Innovation 2023) 5.

health, safety and fundamental rights.[402] The risk categories are as follows. First, the AI Act prohibits specific practices across the EU under Article 5, where such practices are abusive, harmful or contravene EU values such as using an AI system to exploit the vulnerabilities of a specific group or individual.[403] Second, high-risk AI systems are restricted under Article 6, where AI systems are categorised based on their potential to cause harm or impact fundamental rights and, albeit less relevant in this context, to health and safety.[404] This results in subjection to stricter regulatory scrutiny and obligations.[405] Third, systems which pose either limited or minimal risks remain 'largely unincumbered', where such systems are *not* subject to compliance requirements.[406] As ACS was categorised as a high-risk application which initially prompted this thesis, the focus of discussion will move towards high-risk applications specifically.

4.3.4 *High-Risk AI*

The focus of this discussion will be on high-risk AI systems as outlined under Annex III, as ACS is classified as a high-risk use case by the AI Act under Article 6(2)(b), which refers to: '*AI systems intended to be used to evaluate the creditworthiness of natural persons or establish credit score*'.[407]

The justification behind the high-risk classification of ACS is that it determines an individual's essential access to credit: a necessary financial tool that provides opportunities for progression in life.[408] This classification also accounts for the potential for perpetual patterns discrimination to arise, such as discrimination relating to race or ethnic origin, disability, gender, age, sexual orientation, or even unforeseen discriminatory impacts.[409]

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[402] AI Act (n 9) recital 26; and Osman Gazi Güçlütürk, 'The EU AI Act's Risk-Based Approach: High-Risk Systems and What They Mean for Users' (*Holistic AI*) <https://www.holisticai.com/papers/the-eu-ai-acts-risk-based-approach-high-risk-systems> accessed 29 July 2024.

[403] AI Act (n 9) art 5(1)(b) and recital 28; and COM (2021) 206 final (n 386) 'Explanatory Memorandum'.

[404] Ibid, art 6.

[405] Ibid, ch 2, arts 8-15; and Güçlütürk, 'The EU AI Act's Risk-Based Approach' (n 402).

[406] Ibid, art 52; and Schuett (n 389) 4.

[407] Ibid, art 6(2) para 5(b). See the full list in Annex III and art 6(2).

[408] AI Act (n 9) recital 58; and Charles Delancray, 'EU AI Act adopted by the Parliament: What's the impact for financial institutions?' (*Deloitte*) <https://www.deloitte.com/lu/en/Industries/investment-management/perspectives/european-artificial-intelligence-act-adopted-parliament.html> accessed 31 July 2024.

[409] Ibid, recital 58; and Benedict Wagner-Rundell and Matthias Peter, 'Setting the ground rules: the EU AI Act' (*KPMG*, May 2024) <https://kpmg.com/xx/en/home/insights/2024/05/setting-the-ground-rules-the-eu-ai-act.html> accessed 31 July 2024.

For high-risk AI systems, common rules are established with the purpose of ensuring a 'consistent and high level of protection of public interests'.[410] Such systems are deemed to pose significant risk to fundamental rights or health and safety, where the EU states that clear, proportionate and predictable obligations must be set.[411] To reduce the risks that may arise, requirements are established for high-risk systems under Chapter 2 of the AI Act, where providers of the AI system hold complete responsibility for ensuring full compliance with these requirements and within existing EU law.[412] These requirements span across Articles 9 to 15, including requirements to establish and maintain a risk management system, quality requirements for the training, validation and testing of data, technical documentation, record-keeping, transparency in design, human oversight and ensuring an appropriate level of accuracy, robustness and cybersecurity.[413] However, these are significant additional requirements, which may create undue burdens for compliance amongst lenders.[414] In response, concerns arise that potential uncertainty and burdensome requirements may risk stifling innovation, which could reduce the uptake of ACS and AI across the EU.[415]

To summarise, the key differences between the EU and UK's regulatory approaches to AI are as follows. Firstly, the EU has opted for horizontal legislation to issue harmonised rules across all Member States, whilst the UK has opted for a vertical, non-statutory approach. Secondly, the EU has opted for a statutory, technology-neutral definition of AI, whilst the UK has opted for no formal definition, relying instead on functional characteristics. Thirdly, the EU has adopted a system classifying risk, such as the high-risk systems explored above, whilst the UK has opted for a sector-specific and principles-based approach. The crucial element to highlight is that the EU's approach to AI is binding and uniform through legislation, whilst the UK's approach is flexible and non-statutory. As a result, whilst the EU has opted for a prescriptive approach to the regulation of AI, the UK appear to have kept their approach under review at

[410] Ibid, recital 7; to be considered in line with the High-Level Expert Group on AI, 'Ethics Guidelines for Trustworthy AI' (European Commission 2019) (n 69); and the European Declaration on Digital Rights and Principles for the Digital Decade [2022] COM (2022) 28 final.
[411] Harmonised rules should apply across sectors, where the AI Act is complementary to existing legislation, such as consumer protection, data protection and fundamental rights. See AI Act (n 9) recitals 9 and 10; and COM (2021) 206 final (n 386) 'Explanatory Memorandum'.
[412] AI Act (n 9) ch 2, arts 8 and 16(a); and Schuett (n 389) 4.
[413] Ibid, arts 9-15.
[414] Higgins, Jackson and Korten (n 398).
[415] Bradford, 'The False Choice Between Digital Regulation and Innovation' (n 258) 392-393.

this stage before proceeding with legislation, where regulation is currently dealt with on a sector-specific basis.

To continue this discussion surrounding the high-risk classification of ACS, the final chapter will assess whether the UK should follow in the EU's footsteps, to assess whether ACS requires increased regulation or legislative intervention to provide sufficient protection for borrowers.

4.4 Conclusion

In conclusion, this chapter has outlined that whilst the UK's regulatory framework for consumer credit has the potential to be effective in the context of ACS, this regulatory approach appears to be insufficient. Whilst the UK's pro-innovation approach to AI aims to remedy this gap and provides a useful degree of flexibility, it is argued that this may be insufficient to address the specific risks of ACS, in particular due to its non-binding nature. In the alternative, the EU's radical legislative approach to AI has resulted in far stricter oversight over ACS, when compared to its previous ACS regime (and the UK's current ACS regime). This outline has been fundamental in being the final building block in preparation for our fifth and final chapter, where proposals for reform will be made.

The final chapter will assess the effectiveness of the UK's regulatory approach to ACS, assessing both the UK's consumer credit regulatory framework and whether the UK's pro-innovation approach to AI is sufficient to address the gaps left by the consumer credit framework in relation to ACS. This chapter will propose reform to ensure that the regulatory approach adopted can harness the benefits of ACS, whilst mitigating its risks, determining whether the UK should adopt a more stringent, robust approach to ACS regulation which is akin to that which has resulted from the EU's AI Act in the EU. Overall, the final chapter will tie the discussions raised in subsequent chapters together and determine whether the UK's regulatory approach to ACS is effective and, in particular, whether the UK's approach to AI helped, or should have been more aligned to the EU's approach to AI in general (and to ACS in particular).

Chapter 5: Proposals for Reform

The final chapter builds upon the foundations laid throughout this thesis, where the potential benefits and risks associated with the use of ACS and the regulatory challenges involved have been examined. These discussions have outlined how ACS is currently regulated in the UK, where an alternative legislative approach has been outlined through the EU's bolder regulatory approach to AI in general, and ACS in particular. In response, this thesis aims to assess how the UK should respond and regulate ACS moving forwards to ensure the efficient and fair functioning of its consumer credit markets. In doing so, it will also be determined whether new rules are required to strengthen the UK's regime, considering whether inspiration should be taken from the EU's regulatory approach to ACS through the AI Act.[416]

To structure this chapter, this analysis will be conducted as follows. Firstly, the effectiveness of the UK's existing framework for consumer credit regulation will be analysed to determine whether it is sufficient to address the potential market failures arising from ACS. This will be considered in the context of the normative goals of allocative efficiency and distributional fairness and the ACS-specific goal of consumer trust. The potential trade-offs to regulation will also be explored in relation to consumer privacy and innovation, determining how a balance can be struck between the two and assessing the potential costs of regulation.

Secondly, the UK's approach to AI will be assessed to determine if this regulatory approach is suitable to address the limitations identified in the UK's existing regulatory framework for consumer credit. This discussion will allow for an assessment as to whether both the UK's regulatory framework for consumer credit and approach to AI together constitute effective regulation. Returning to the EU as a comparator, the EU's legislative approach will also be assessed, to determine whether the UK should have followed suit by adopting a more radical, bolder approach to the regulation of ACS and AI more broadly.

Finally, this chapter will emphasise the necessity of reform by critically assessing the UK's existing regulatory approach to ACS. To do so, proposals for reform will be made to ensure that a sufficient balance can be struck between harnessing the potential benefits of ACS, whilst

[416] AI Act (n 9).

mitigating its potential risks and minimising the extent of any potential trade-offs and costs to regulation.

Overall, it will be argued that whilst the UK's current regulatory approach offers some degree of flexibility, further reform is necessary to provide a more comprehensive and effective regulatory approach to ACS. The following conclusions will be made. Firstly, it will be concluded that the UK's regulatory framework for consumer credit is insufficient to address the unique risks and challenges that ACS brings, where there is a need for increased regulatory measures to address the potential risks that may arise. Secondly, it will be concluded that whilst the UK's pro-innovation approach to AI has the potential to address some of the regulatory gaps that remain, this proves inefficient due to its non-binding nature. Where the EU is offered as a comparator, providing an alternative approach to AI and ACS regulation, it will be concluded that whilst this approach is far bolder and binding in nature, it remains far too broad, where the UK's sector-specific, vertical approach is far more favourable than its radical and prescriptive EU counterpart.

To summarise, it will be concluded that there is an increased need for regulation to address the potential risks arising from ACS, to ensure that these challenges do not outweigh the benefits of this technology, where, as the adoption of ACS increases, the need for an effective regulatory approach that is both robust and flexible becomes increasingly evident.[417]

5.1 Assessing the UK's Existing Regulatory Framework for Consumer Credit

To begin, the effectiveness of the UK's existing regulatory framework for consumer credit will be assessed to determine if its application sufficiently extends to ACS and can address potential market failures. This will be addressed in relation to the key goals of financial regulation of allocative efficiency and distributional fairness, before considering how this framework responds to the ACS-specific challenges of increasing consumer trust in the use of AI.

5.1.1 *Allocative Efficiency*

When considering the goal of allocative efficiency, it can be argued that the UK's existing regulatory framework for consumer credit can adapt to effectively regulate and accommodate

[417] Sauradeep Bag, 'AI and credit scoring: The algorithmic advantage and precaution' (*Observer Research Foundation*, 31 May 2024) <https://www.orfonline.org/research/ai-and-credit-scoring-the-algorithmic-advantage-and-precaution> accessed 22 August 2024.

ACS, where existing and emerging risks regarding the use of alternative data and the algorithms used in assessing consumer creditworthiness may not be unique to ACS specifically.[418] For example, by adopting a technology-neutral approach to regulation, the FCA's existing rules and regulatory framework, such as CONC,[419] do not specifically mandate or prohibit any specific technologies.[420] This highlights how the UK's existing framework for consumer credit could sufficiently extend to ACS, where the broad requirements placed allow for clarity and fairness whilst permitting algorithms to assess credit risk more accurately for borrowers and at a larger scale; reducing cost, time and aiding efficiency.[421] Therefore, it is argued that the UK's existing regulatory framework for consumer credit could sufficiently extend to ACS whilst remaining compatible with the goal of allocative efficiency.

However, the UK's existing regulatory framework for consumer credit proves insufficient in addressing the information asymmetry present within ACS. There is an amplified risk that lenders could potentially exploit their informational advantage over borrowers, as lenders may have too much power in relation to the access to data and the algorithms used when specific regulation is not issued to counteract and address any risks unique to ACS. For example, the use of black-box algorithms could raise concerns as to information asymmetry, where even lenders themselves may not be able to explain the decisions reached.[422] To remedy this, there must be consideration into the potential need to disclose information as to how creditworthiness assessments are undertaken when ACS is used.

In reducing the information asymmetry between lenders and borrowers, this must come with careful consideration surrounding protecting the proprietary rights of lenders.[423] For example, the possession of proprietary rights by lenders could be problematic, which could place lenders in a position where they may stand to benefit from working around the regulatory structures in place.[424] This consideration may cause conflict with achieving the goal of allocative efficiency under the existing regulatory framework, on the basis that borrowers may face unnecessary harm because of this disproportionate informational imbalance.

[418] FCA, 'AI Update' (n 296) 10.
[419] FCA, 'CONC' (n 29) 5.2A.
[420] FCA, 'AI Update' (n 296) 10.
[421] FCA, 'CONC' (n 29) 5.2A.
[422] Campbell et al (n 48) 92.
[423] Bundy et al (n 84) 21.
[424] Armour et al (n 184) 13.

Increased regulation may be beneficial to assist in increasing the mandatory disclosure of information to borrowers by reducing the information asymmetry present for borrowers, whilst maintaining an appropriate degree of proprietary protection for lenders. On this note, regulators should consider provisions for the regulation of information, where the extent of success of such measures should be kept under careful review to find a suitable balance for all parties involved.[425]

Overall, it is argued that whilst the UK's regulatory framework for consumer credit offers the potential to provide effective regulation for ACS, it does not extend far enough. To remedy this, there is a clear need for proportionate regulation for ACS to address the information asymmetry between lenders and borrowers, as this will help to avoid market failure and ensure that the consumer credit market is able to function well and efficiently by supporting the goal of allocative efficiency.

5.1.2 *Distributional Fairness*

When considering the goal of distributional fairness, it can be argued that the UK's existing regulatory framework for consumer credit is sufficient to allow ACS to use alternative data to assess creditworthiness, as it can assist individuals often restricted by traditional credit scoring models and their limited access to data. For example, existing guidance such as the Consumer Duty aids in ensuring fairness and consumer protection by placing a higher standard of care on lenders to consider borrowers in their outcomes when ACS is used.[426] By requiring active steps from lenders to monitor and mitigate the potential risks that borrowers may face, this could be a positive step forwards in protecting borrowers and ensuring fairness through the use of ACS.[427] For example, this is important when considering the use of black-box algorithms in ACS, where if their use is not effectively monitored by lenders, borrowers risk facing harm through algorithmic bias.[428]

Furthermore, there is a need to consider regulation in the context of ensuring the quality of data, considering the vulnerability of borrowers and affordability. In theory, the existing

[425] Rühl, 'Consumer Protection in Choice of Law' (n 200) 581.
[426] FCA 2022/31 (n 288) 12.
[427] Ibid, 12.
[428] FCA, 'Finalised Guidance: FG22/5' (n 289) 8.

measures could offer some degree of protection for borrowers in the context of ACS. However, the combination of soft-law measures through voluntary rules and guidance and the lack of specificity regarding ACS through existing legislative measures (such as Article 22(4))[429] leads to their insufficiency.

As a result, it is argued that further guidance may be necessary to provide a further layer of protection for vulnerable borrowers to ensure that ACS does not infringe upon consumer protection, including addressing remaining concerns such as how borrowers facing financial difficulty may be treated by lenders.[430] To counteract this, regulatory intervention is necessary to support these goals and ensure that market failure is avoided, where regulation must be targeted towards the risks specific to ACS to ensure that no new inefficiencies are caused and instead the existing risks are eliminated.[431]

5.1.3 *Consumer Trust*

Beyond the scope of traditional financial regulation and its challenges, ACS presents the unique challenge of requiring increased consumer trust in the use of AI, where borrowers should feel empowered and have trust, confidence and faith in the consumer credit market.[432] Therefore, having effective regulation in place is essential to increase the adoption of ACS and to encourage its adoption, as this will allow ACS to serve its function in benefiting the overall consumer credit market.[433]

In response, it is argued that the current regulatory framework supports this aim, where the technology-neutral definitions used within the FCA's guidance, such as CONC,[434] allows it to be applied broadly to extend to ACS. Whilst it is acknowledged that the UK GDPR attempts to provide a right to explanation to borrowers,[435] it is argued that if the algorithms themselves

[429] UK GDPR (n 302) art 22(4).
[430] Colin Hogg, 'Consumer Duty regulation – what does it mean for credit risk?' (*Experian*, March 2023) <https://www.experian.co.uk/blogs/latest-thinking/automated-credit-decisions/consumer-duty-regulation-for-credit-risk/> accessed 19 August 2024.
[431] Borys Grochulski and Wendy Morrison, 'Economic Brief: Understanding Market Failure in the 2007-08 Crisis' (Federal Reserve Bank of Richmond 2014) 2.
[432] Armour et al (n 184) 12.
[433] KPMG and The University of Queensland, 'Trust in Artificial Intelligence: A five country study' (2021) 5 and 52.
[434] FCA, 'CONC' (n 29) 5.2A.
[435] UK GDPR (n 302) arts 13(2)(f), 14(2)(g), and 15(1)(h).

remain unclear and unexplainable to lenders, this raises cause for concern as to whether it is sufficient to protect consumers from potential discrimination.[436] In addition, it is argued that Article 22, for example, should be clearer as to whether ACS constitutes automated-decision making to ensure greater protection, where the overlap between financial regulation and data protection regulation should be bridged better.[437]

However, the existing framework may prove insufficient to address the unique challenges emerging from the use of ACS and AI. This can be evidenced by the example of lack of transparency within black-box algorithms, which may risk undermining consumer trust if the use of ACS results in decisions that are both uninterpretable and unexplainable. Even if existing regulation extended to the use of ACS, if the decision cannot even be explained by the lender, this indicates that regulatory intervention is necessary to regulate the use of black-box algorithms further.

Furthermore, whilst it is acknowledged that legislative measures such as the UK GDPR do come into play here, soft-law measures such as CONC establish the foundation of consumer credit regulation in the UK.[438] Because of this, the extent of the sufficiency of such measures is limited, on the basis that they are not binding and therefore are simply guidelines and suggestions, rather than rules to follow. Therefore, it is argued that specific, binding requirements may be necessary to regulate ACS moving forwards in relation to consumer trust.

Consequently, it is argued that increased regulation is necessary to serve the purpose of increasing consumer trust in the use of ACS, as this will allow ACS to achieve its aim of supporting the overall functioning of the consumer credit market. However, to be effective, regulation must strike a sufficient balance between the potential benefits of ACS, whilst mitigating the potential risks that may arise from its use.

5.1.4 *Is the UK's Regulatory Framework for Consumer Credit Sufficient?*

Following this, an assessment will now be carried out as to whether the UK's regulatory framework for consumer credit in its current form is sufficient to address ACS.

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[436] Ibid, arts 13(2)(f), 14(2)(g), and 15(1)(h).
[437] Ibid, art 22.
[438] FCA, 'CONC' (n 29).

On the one hand, it is argued that the UK's existing regulatory framework for consumer credit appears to accommodate ACS and its implementation into the consumer credit market. The FCA's technology-neutral approach to regulation through its rules, regulations and guidelines extends fairly well to the use of ACS, which helps to ensure that borrowers are sufficiently protected within consumer creditworthiness assessments. This existing approach aligns considerably with the regulatory goals surrounding ACS, providing scope for the use of ACS that is both efficient and fair in practice, whilst also ensuring mechanisms are in place for consumer protection if necessary. Overall, the UK's existing financial regulatory framework for consumer credit does take positive steps forward, establishing a solid base foundation for the regulation of ACS.

On the other hand, whilst in theory this existing framework appears to mitigate the potential risks that borrowers may face through ACS, its efficiency may be limited in practice. To support this view, whilst both CONC[439] and the FCA's Principles[440] are useful tools in relation to consumer protection and credit scoring specifically, both remain as soft-law guidance only, rather than serving as a binding rule.[441] As a result, it is argued that this framework lacks binding teeth, where despite appearing sufficient in theory to harness the benefits of ACS whilst addressing its risks, the FCA's guidance places no binding obligation of compliance on lenders,[442] instead only indicating what factors *might* be relevant in assessing creditworthiness.[443] Therefore, this existing framework appears insufficient to address ACS in its current form, on the basis that whilst the FCA's guidance is well-intentioned, it remains illustrative and is not prescriptive, risking non-compliance from lenders.[444]

Furthermore, this issue is exacerbated by the risk of lenders engaging in regulatory arbitrage: finding loopholes within existing regulation to exploit the market.[445] This risk is reflective of market failure concerns for ACS, as there is a risk of lenders exploiting borrowers if existing regulation in its current form allows them to evade responsibility. To address this, regulatory intervention may be necessary to support these goals and ensure that market failure is avoided;

[439] FCA, 'CONC' (n 29).
[440] FCA, 'Principles for Businesses' (n 288).
[441] FCA, 'Understanding consumer credit' (n 32) 2.
[442] FCA, 'Guide for consumer credit firms' (n 280) 6.
[443] FCA, 'Understanding consumer credit' (n 32) 2.
[444] Ibid, 3.
[445] Armour et al (n 184) 13.

where regulation should be targeted towards the risks specific to ACS to ensure that no new inefficiencies are caused, and that existing risks are eliminated as necessary.[446]

Overall, whilst the UK's existing regulatory framework for consumer credit extends to ACS and offers the potential to support the goals of allocative efficiency, distributional fairness and consumer trust, it is argued that further reform is necessary to strengthen this regulatory framework to ensure that it remains effective when ACS is used. In addition, it is essential to address any potential market failures to ensure both efficiency and fairness in the consumer credit market and to build consumer trust. To help achieve these goals, it is argued that regulatory intervention may be the guiding hand needed.[447]

5.2 The Trade-Offs and Costs of Regulation

Next, it will be determined whether the UK's existing regulatory framework adequately addresses any market failures given the current tools, where the extent to which any potential trade-offs and costs would outweigh the potential benefits to regulation will be considered.[448] If it is concluded that the costs of remedying these failures *do* outweigh the benefits, it must then be determined whether an alternative remedy must be sought or if that specific failure is able to remain uncorrected to mitigate any potential harm from intervention.[449]

5.2.1 *Consumer Privacy and Autonomy*

To create a well-regulated and efficient market, effective consumer protection regulation is essential. In the context of ACS, such regulation could provide a situation where everyone wins: borrowers are protected and have security and the protection of quality of services, whilst lenders can benefit from and reap the rewards of increased consumer trust.[450] For example, in other areas of the law such as contract law, consumer protection regulation has prescribed implied terms and set requirements for the standards of goods and services to help to ensure quality and fairness for consumers.[451] Therefore, whilst ACS may help to benefit the goals identified above, it should be noted that the use of ACS may result in a potential trade-off to

[446] Grochulski and Morrison, 'Economic Brief: Understanding Market Failure in the 2007-08 Crisis' (n 442) 2.
[447] Armour et al (n 184) 54.
[448] Ibid, 52.
[449] Ibid, 52.
[450] John TD Wood, 'Consumer protection: A case of successful regulation' in Peter Drahos et al, *Regulatory Theory: Foundations and Applications* (ANU Press 2017) 650.
[451] Ibid, 643.

consumer protection through the issues of consumer privacy and autonomy, which overlaps into the regulatory remit of data protection regulation.[452]

Following this, it will be assessed whether the use of ACS is worth the potential trade-off to consumer privacy and autonomy, and whether the existing framework can mitigate the potential for bias and discrimination arising from ACS. At first glance, it may appear as if the existing framework acknowledges this goal, where protections against discrimination exist under the EA 2010 and the right to explainability and the right to opt out of automated decision-making under the GDPR.[453] However, there are tensions of large data sets and protecting privacy, where these provisions may prove insufficient in targeting ACS specifically.

Returning to the example of black-box algorithms, explainability and transparency may be potential issues here, which creates a problem as even if the algorithms are useful, if they are not explainable then this requires stricter controls. Therefore, it is argued that there is a need for stricter, increased regulation to define what data is appropriate to use in ACS, where this regulatory approach should establish a balance between fairness and protecting consumers privacy and autonomy.

To reduce the potential trade-off to consumer privacy and autonomy, it is identified at this stage that there must be further measures in place, such as stricter controls and guidelines for the algorithms used in ACS, to mitigate this potential trade-off. Without clear guidelines, this creates difficulty for lenders in determining the ethical boundaries of personal data use in ACS.

5.2.2 *The Potential Cost to Innovation*

Overall, whilst the use of ACS can help further and improve the normative goals of allocative efficiency and distributional fairness, it is argued that a proportionate balance must be struck between ensuring the stability of the consumer credit market and financial system, whilst encouraging the potential for innovation.[454] However, the cost of stricter regulation to mitigate the trade-off to consumer privacy and autonomy when ACS is used must be carefully considered alongside the potential regulatory costs to innovation, where steps are required to

[452] CP 525 (n 239) 16.
[453] UK GDPR (n 302) arts 22 and 22(4); EA (n 304) s 13 and s 19.
[454] Blind (n 265) 15.

be taken to balance prevention of risk and encouraging innovation.[455] Ultimately, there is a need to minimise the cost of regulation as much as is reasonably possible.[456] It may be raised here that if regulation were to be implemented too strictly and too early, this may result in a burdensome need to constantly refine the regulation in place.[457]

The objective of supporting innovation means that the regulation surrounding ACS should foster innovation whilst ensuring consumer safety and fairness. Excessive regulation could potentially stifle innovation, but too little may leave borrowers vulnerable and result in trade-offs to privacy and autonomy. The goal in response should be to allow innovation, such as ACS, in a manner that is safe and considers consumer protection, where regulation should be goal-based where possible. For example, regulators and innovators must be able to balance the development of ACS to create sufficient regulation. On the one hand, this can be achieved whereby regulators remain informed by innovators to safely address concerns and challenges as they arise.[458] On the other hand, this can be achieved where innovators remain aware of the prevailing regulatory concerns which may be remedied by the proposition of 'acceptable' approaches in the interests of consumer protection.[459] If a balance can be implemented successfully between innovators and regulators, this could provide the overall benefit of breaking down potential barriers to innovation, which in turn could limit the potential adverse impact to cost.

5.2.3 *Balancing the Need for Regulation with the Costs of Intervention*

In response, it is argued that the regulatory approach adopted must balance innovation and risk, where this could be mitigated through reform to establish clear, consistent guidelines and standards that support innovation whilst protecting the interests of borrowers. Therefore, it is argued that whilst ACS can support the goals of allocative efficiency and distributional fairness, increased regulation is necessary to address any regulatory gaps to increase consumer trust and to protect consumer privacy and autonomy, all balanced against the risk of stifling

[455] Ya Bu, Hui Li and Xiaoqing Wu, 'Effective regulations of FinTech innovations: the case of China' (2021) 31(8) Economics of Innovation and New Technology 751, 755.
[456] Rühl, 'Consumer Protection in Choice of Law' (n 200) 594.
[457] Edward J. Kane, 'Accelerating Inflation, Technological Innovation, and the Decreasing Effectiveness of Banking Regulation' (1981) 36(2) The Journal of Finance 393, 395.
[458] Fairclough (n 256) 11.
[459] Ibid, 11.

innovation. This discussion will be returned to following the discussion on the proposals for reform at the end of this chapter.

5.3 Does the UK's 'Pro-Innovation' Approach to AI Help?

To build upon this analysis, the UK's pro-innovation approach to AI will be discussed to determine whether this addresses the limitations identified in the UK's existing regulatory framework for consumer credit.[460] On this point, it will be determined whether these measures together are enough to effectively harness the benefits of ACS whilst mitigating its risks.

To engage with this discussion, it will be assessed whether the UK's approach to AI is sufficient to strike a balance between maximising the benefits of the use of ACS whilst minimising any potential risks that may arise. This discussion will also involve considering the extent of any potential trade-offs to innovation and consumer privacy and autonomy, to determine how these trade-offs could be mitigated.

Finally, to develop this argument, it will be discussed whether the UK's sector-specific regulatory framework was the correct approach to AI, or whether an alternative approach similar to the EU's should have been adopted instead.

5.3.1 *A Technology-Neutral Definition of AI*

In providing a definition for AI, regulation can either be technology-specific or technology-neutral.[461] In most circumstances, technology-neutrality is the more favourable approach, as opting for neutrality can provide regulatory certainty and long-term stability by requiring less adaptation over time to accommodate technological and computational developments.[462]

On this view, it is argued that by adopting no formal definition of AI and instead opting for a loose definition based on the functional characteristics of 'adaptivity' and 'autonomy', the UK's approach to a definition of AI is the more favourable approach, allowing for amendments over time to accommodate potential developments where necessary.[463] Additionally, by defining AI in alignment with these functional characteristics, the UK's approach provides

[460] CP 815 (n 11) 20.
[461] Butenko and Larouche, 'Regulation for innovativeness or regulation of innovation?' (n 253) 74.
[462] Ibid, 75.
[463] Difficulty in assigning responsibility for the outcomes reached; see CP 815 (n 11) 20.

scope to 'future-proof' its framework, where as it is flexible it is less likely to become quickly outdated or restrictive and is able to accommodate the rapid evolution of AI.[464]

It should be noted here that whilst the EU has opted for a formal, statutory definition of AI, this is still appropriate as it remains careful in its approach by remaining technology-neutral.

Overall, it is argued that technology-neutrality is the most appropriate approach when defining AI, as the higher the degree of technology-specificity, the shorter the lifespan of the regulation.[465] Therefore, it is argued that the UK's definition of AI is the most suitable in the context of ACS. This argument is made on the basis that the flexibility provided in adopting a technology-neutral and functional definition allows for the potential benefits of ACS to be harnessed whilst providing scope to mitigate the potential risks.[466]

5.3.2 *A Sector-Specific and Principles-Based Approach*

Furthermore, by adopting a sector-specific and principles-based approach to regulation, this can aid in supporting consumer trust in the use of ACS and AI, which in turn can increase its use and adoption.[467] This approach also provides the benefit of flexibility for the UK to innovate and adapt by encouraging more proportionate outcomes at this stage than prescriptive detailed rules. This is beneficial for both consumer protection, allowing flexibility to protect borrowers from emerging harms, whilst supporting innovation to improve and streamline creditworthiness assessments without being limited by prescriptive legislative requirements.

Whilst the UK's principles-based approach is a positive, adopting a sector-specific approach is beneficial in establishing effective regulation for ACS and AI more broadly as it is proportionate, fitting across contexts.[468] To continue this argument, the effectiveness of the cross-sectoral principles as they apply to the UK's consumer credit framework will now be discussed.[469]

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[464] CP 815 (n 11) 20; and DSIT, OAI and CDEI, 'A guide to using artificial intelligence in the public sector' (n 333).
[465] Lyria Bennett Moses, 'How to Think about Law, Regulation and Technology: Problems with "Technology" as a Regulatory Target' (2013) 5 Law, Innovation and Technology 1.
[466] CP 815 (n 11) 16.
[467] Ibid, 17.
[468] Ibid, 23-27; and Haie et al (n 329).
[469] Ibid, 23.

Safety, Security and Robustness

The first principle of safety, security and robustness as it extends to ACS is beneficial, as this regulatory approach encourages prioritising safety and technical security through the design and deployment of robust AI systems. However, in practice, the existing consumer credit framework as it applies to ACS relies relatively heavily on soft-law measures, such as CONC,[470] which results in a lack of enforceability.[471] For example, whilst the thought behind this principle is to promote technical security, explainability and transparency, in practice its implementation lacks enforceability which consequently undermines its effectiveness.

Appropriate Transparency and Explainability

The second principle of appropriate transparency and explainability has the potential to be effective and is well-intentioned, where there is provision for the issuing of guidance and technical standards to encourage transparency and explainability within AI systems. For example, the UK has implemented the Consumer Duty,[472] where positive steps must be taken to ensure that borrowers are protected and achieve a positive outcome in financial services.[473] In the context of ACS, this principle is beneficial when considering the regulation of black-box algorithms, where requiring appropriate transparency and explainability regarding the decision reached helps promote algorithmic responsibility through the use of ACS.

Fairness

The third principle of fairness requires the FCA to outline exactly *how* AI systems are used within the context of ACS and the consumer credit market, to ensure that this aligns with the existing laws for consumer credit.[474] This principle appears beneficial as it encourages proportionate and fair regulation suitable to the context of ACS specifically. This is particularly useful to draw a clear line when considering how ACS is used in relation to credit risk, to ensure that ACS can be used for the benefit of lenders and borrowers and that regulation can be effective.[475] Alike the principles of safety, security and robustness and appropriate

[470] FCA, 'CONC' (n 29).
[471] CP 815 (n 11) 24-25; and FCA, 'AI Update' (n 296) 11.
[472] FCA 2022/31 (n 288).
[473] CP 815 (n 11) 25; adapted from IEEE Standards Association (n 347).
[474] Ibid, 27.
[475] FCA, 'AI Update' (n 296) 14.

transparency and explainability, the FCA demonstrate their compliance of this principle through its Principles[476] and the issuing of guidance, such as the Consumer Duty.[477]

However, whilst these principles hold the potential for positive implications if appropriately implemented, their effectiveness is limited in practice due to their lack of a binding nature. To be effective, it is arguably necessary to enshrine these principles and their applicable guidance in legislation to ensure long-term consumer protection.[478]

Accountability and Governance

The fourth principle of principle of accountability and governance initially appears to enable the effective oversight of AI systems, yet it appears to be ineffective in practice. This argument arises as despite adopting a sector-specific approach to regulation, regulators were offered no further powers by the UK's approach to AI. This may result in the consequence of regulatory incoherence across sectors, which may limit the effective oversight of AI systems and result in regulators needing to constantly refine their regulatory approach.[479]

A key example to illustrate this point is that the FCA's supervisory approach to the regulation of ACS is insufficient in its current form, where reform may be necessary to increase the scope of its existing powers in relation to governance and risk management. This is argued on the basis of the complexity and potential implications for borrowers that may arise from ACS and AI and ML technologies overall.[480] To improve this in practice, suggestions may include imposing requirements upon lenders to provide a greater focus on the explainability of AI models, implemented through an increased focus on validation and testing of the algorithms used.[481] This could be strengthened through providing for stronger accountability principles in practice, where transparency and openness surrounding the use of ACS is crucial.[482] Therefore, it is clear that reform is necessary to allow existing regulation to be adapted to more accurately accommodate ACS.[483]

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[476] FCA, 'Principles for Businesses' (n 288).
[477] FCA, 'AI Update' (n 296) 13.
[478] CP 815 (n 11) 25; adapted from IEEE Standards Association (n 347).
[479] Ibid, 28.
[480] FCA, 'AI Update' (n 296) 4.
[481] Ibid, 4.
[482] Ibid, 4.
[483] Ibid, 4.

Contestability and Redress

The fifth and final principle of contestability and redress does not provide adequate mechanisms for consumers to challenge AI decisions, as this principle introduces no new routes for redress.[484] Whilst enforcement is beyond the scope of this thesis due to the recent nature of the UK and EU's regulatory approaches to ACS, it is acknowledged this principle proves insufficient.

The Challenge of Regulatory Incoherence

Overall, the UK's principles-based and sector-specific approach may give rise to regulatory incoherence amongst sectors, particularly between the FCA and financial regulation, and the ICO and data protection regulation.[485] This argument arises as the differing powers and regulatory measures adopted amongst sectors may prove an issue in future if not carefully monitored, which is a task to be undertaken by the UK's monitoring and evaluation framework.[486]

In addition, due to the rapid developments of AI technology, there is a risk that regulators may need to continuously refine their regulatory approach. In turn, this could worsen this problem whereby existing regulation may become outdated, and therefore ineffective, resulting in further discrepancies amongst regulators.[487] In response, it is necessary to ensure that the pro-innovation framework is sufficiently adaptable and future-proof, whilst placing heavy responsibility on the collaboration between regulators, the government and across sectors to ensure innovation is not compromised.[488] Therefore, this remains a significant challenge still, where a fragmented approach across sectors and regulators may result in inconsistences that hinder effective oversight.

5.3.3 *Assessing the UK's Regulatory Approach to AI*

Overall, it is argued that the UK's approach to AI as it builds upon the UK's consumer credit regulatory framework is a good starting point. However, this approach may lack effectiveness

[484] CP 815 (n 11) 29.
[485] ICO, 'Guidance on AI and data protection' (n 264).
[486] CP 1019 (n 337).
[487] Vallance, Lakhani and Clifford (n 321) 6.
[488] CP 815 (n 11) 15.

and comprehension in practice, where this will approach will now be assessed in line with the aims the UK's pro-innovation approach sets out.

Firstly, the framework aims to support consumer trust by adopting a clear and proportionate approach to the regulation of AI. In theory, this sector-specific and principles-based approach takes positive steps forwards in regulating ACS by encouraging regulation to be proportionate in relation to the context and outcomes of the specific use of AI. However, in practice a non-binding framework is limited in its approach, which may result in regulatory incoherence. On this point, it is argued that this aim is not sufficiently met when it comes to consumer trust.

Secondly, the framework aims to support growth and prosperity by supporting responsible innovation whilst reducing regulatory uncertainty. It is argued that whilst the UK's regulatory approach to ACS provides a degree of flexibility and subsequently aids innovation where refinement is necessary, it may be overly flexible, resulting in adverse effects due to the regulatory uncertainty that follows. As a result, whilst the UK's regulatory approach provides the benefit of flexibility, which usefully can limit the costs to regulation, its effectiveness may potentially be limited due to the non-binding nature.

Thirdly, the framework aims to drive global leadership in AI. However, based on the limitations identified above, there may be regulatory inconsistencies that hinder the UK's global leadership in AI. For example, if the EU's GDPR indicates the prospective success of the AI Act, it can be argued the 'Brussels Effect'[489] should be a factor considered here, where this framework became the standard for global compliance of data protection regulation.[490] Therefore, in these circumstances, the extraterritorial effect of the AI Act cannot be underestimated, where the EU's bolder approach to the regulation of AI spans across all Members States. On this basis, it is unclear if a sector-specific approach to the regulation of AI was the most appropriate considering all the circumstances.

Whilst the UK's approach takes steps forward to meet its aims by being both flexible and good for innovation, it could potentially be problematic in ensuring coherent and binding regulation. To address this limitation, it is argued that reform is necessary to ensure that this regulatory

[489] See footnote (n 393) and Bradford, *The Brussels Effect* (n 393) 25-26.
[490] 'Europe, a laggard in AI, seizes the lead in its regulation' (n 394). Referring to the GDPR (n 302); and AI Act (n 9).

framework is clearer, binding and more coherent across sectors, where the need for a combination of binding regulation and legislation must be assessed.

5.4 Proposals for Reform

Finally, proposals for reform will be made to answer our question as to whether the UK's existing regulatory approach to ACS is sufficient in its current form. The EU's AI Act will be returned to as a comparator, where the key aspects of the EU's legislative approach will be assessed to determine whether the UK should have opted for a bolder approach to the regulation of AI and ACS by association.

5.4.1 *Binding Legislation?*

Firstly, it will be discussed whether adopting binding legislation would be an appropriate step forwards in the regulation of ACS in the UK. To do so, it will be considered whether there is a need to introduce a statutory duty for regulators to comply with and implement these principles: a duty which should allow regulators to exercise their judgment flexibly when applying the principles in their relevant contexts.[491]

However, it is acknowledged that the UK government do not currently wish to impose such a statutory duty unless absolutely necessary.[492] Instead, they propose to work collaboratively with regulators and take an adaptable approach, providing that their monitoring of the framework shows that its implementation stands effectively without the need to legislate.[493] Therefore, whilst flexibility is crucial to support innovation currently, future legislation is likely to be necessary[494] once the risk matures and technological developments settle.[495] However, the UK's approach has been criticised as 'all eyes, no hands': providing scope to monitor existing and emerging risks, yet lacking sufficient powers and resources to prevent those risks or even react to them effectively after the fact.[496]

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[491] CP 815 (n 11) 6.
[492] Ibid, 6.
[493] Ibid, 6.
[494] Valeria Gallo and Suchitra Nair, 'The UK's framework for AI regulation' (*Deloitte*, 21 February 2024) <https://www.deloitte.com/uk/en/Industries/financial-services/blogs/the-uks-framework-for-ai-regulation.html> accessed 25 July 2024.
[495] Herbert Smith Freehills, 'Regulating AI' (n 327).
[496] Michael Birtwistle, 'Ada Lovelace Institute statement on the UK's approach to AI regulation' (*Ada Lovelace Institute*, 7 February 2024) <https://www.adalovelaceinstitute.org/press-release/statement-on-uk-ai-regulation/> accessed 25 July 2024.

Comparatively, the EU has opted for a binding legislative framework through the AI Act,[497] which has the benefit of reducing fragmentation across Member States by providing a comprehensive regulatory framework for the use of ACS and AI more broadly. This is supportive of the aim of global leadership in AI, as this approach adopts uniform obligations and protections, which may aid compliance as the EU have aimed for a harmonised legal framework which serves to reduce fragmentation.[498] However, the EU's approach has its limitations, where this approach may risk stifling innovation by lacking flexibility and being too broad in practice. Therefore, whilst appearing beneficial on the surface, the EU's approach may be too prescriptive and could unintentionally harm the adoption of AI.

Overall, whilst the EU's framework is bolder and more prescriptive and that there are lessons to be learned from it, the UK's sector specific flexibility should be preserved, albeit with tighter legislative controls. Therefore, it is argued that the UK's voluntary commitments to good practice are insufficient, where binding legislation is necessary to ensure these principles are binding and can help effectively supports its aims.[499]

5.4.2 *Classification of Risk?*

Secondly, the EU's AI Act categorises AI systems based on risk depending on the intensity and the risk level[500] posed to the fundamental rights of borrowers and for health and safety.[501]

Whilst it is acknowledged that a risk-based approach does not allow all risks to be avoided, it provides the benefit of allowing for proportionate, targeted action to be taken[502] by prioritising addressing the most serious risks surrounding AI.[503] On this basis, the classification of risk adopted allows risk to be addressed in a 'differentiated manner' where the greater the risk, the

[497] Matt O'Shaughnessy and Matt Sheehan, 'Lessons From the World's Two Experiments in AI Governance' (Carnegie Endowment for International Peace, 2023).
[498] AI Act (n 9) recital 2.
[499] O'Shaughnessy and Sheehan (n 520).
[500] AI Act (n 9) recital 48; and Hickman et al (n 382).
[501] Ibid, recital 26; and Güçlütürk, 'The EU AI Act's Risk-Based Approach' (n 402).
[502] OECD, 'Risk and Regulatory Policy: Improving the Governance of Risk' (OECD Reviews of Regulatory Reform 2010) 16.
[503] Robert Baldwin and Julia Black, 'Driving Priorities in Risk-based Regulation: What's the Problem?' (2016) 43(4) Journal of Law and Society 565.

more stringent the regulatory approach taken must be.[504] This is argued on the basis that ACS may infringe upon an individual's fundamental rights, where these more stringent measures are useful in ensuring protection.

However, it is crucial to balance this benefit alongside the potential burden that lenders may face, where excessive compliance costs may arise which may have detrimental costs to innovation. In relation to this, it is argued that if the UK implemented similar measures, this would be preferable through targeted regulation to take this approach a step further, for whilst a broader approach has the potential to be beneficial, specific use cases may need tighter regulatory control. [505]

5.4.3 *Top-Down or Sector-Specific?*

Thirdly, the EU's top-down, horizontal approach provides the benefit of being prescriptive and comprehensive, but it may equally hinder innovation as a consequence by lacking the necessary flexibility to address sector-specific needs.

The EU's approach offers a blanket, robust approach to the regulation of AI, where the AI Act extends to all Member States across *all* sectors.[506] At first glance, this appears to be a beneficial approach to establish uniformity and set a leading example across Member States by providing for regulatory cohesion across the EU. However, this blanket approach may be problematic in practice, where it seemingly fails to consider the context of each individual application and may potentially stifle developments in innovation if it is too rigid. Whilst it is recognised that this can help increased human-centric and trustworthy AI by issuing blanket rules across sectors,[507] it is argued that further action must be taken if the UK were to adopt similar measures to ensure that innovation does not pay the price.

5.4.4 *A Technology-Neutral Approach?*

Fourthly, it is also argued that the definition surrounding AI should remain technology-neutral, rather than technology-specific. By providing a concrete statutory definition at first instance,

[504] Gabriele Mazzini and Filippo Bagni, 'Considerations on the regulation of AI systems in the financial sector by the AI Act' (2023) 6 Frontiers in Artificial Intelligence 1, 3.
[505] Ibid, 7.
[506] Haie et al (n 329).
[507] AI Act (n 9) recitals 1 and 6; and Hacker (n 337) 3.

this may become quickly outdated due to the rapid pace of technological developments.[508] On this basis, it is argued that technology-neutrality is the best option moving forwards, as the more technology-specific the regulation is, the shorter its lifespan.[509] There is a difficult line to draw here, as such a definition may be too broad.[510] Equally, a definition that is too narrow could be just as harmful, where crucial use cases of AI requiring stricter regulatory intervention may be overlooked. Therefore, it is argued that adopting a technology-neutral approach would be the most appropriate in the context of ACS to ensure that regulation remains suitably future-proof.[511]

Furthermore, it is argued that there is a need for technology-neutrality on the basis that some technologies are easier to regulate, falling into a category more smoothly than others. However, use cases such as ACS may present extraordinary risks that require vastly different regulatory measures to be taken in comparison to other areas of AI.[512] As the use of AI entails a broad range of use cases, where this is context dependent, it is proposed that the best approach in the circumstances would be to adopt a technology-neutral, principles-focused approach to regulation.

In doing so, this provides the opportunity for regulation to align existing regulatory measures in financial regulation, whilst allowing scope to strike an effective balance between both risk management and supporting innovation in relation to ACS.[513] Overall, it is proposed that adopting a technology-neutral approach to the regulation of ACS is beneficial in the circumstances, whilst remaining aware and acknowledging that specific technologies may require more stringent regulatory measures than others.[514]

5.4.5 *Specific Measures for Reform*

To supplement the above proposals, specific measures for reform are proposed as follows.

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[508] Bank of England, Prudential Regulation Authority (PRA) and FCA, 'FS2/23 – Artificial intelligence and Machine Learning' (2023) 6.
[509] Roger Brownsword and Han Somsen, 'Before We Fast Forward – A Forum for Debate' (2009) 1 Law, Innovation and Technology 1, 3.
[510] Bank of England, PRA and FCA, 'FS2/23' (n 533) 6.
[511] Bert-Jaap Koops, 'Should ICT Regulation Be Technology-Neutral?' in Bert-Jaap Koops et al (eds), *Starting Points for ICT Regulation* (Asser Press 2006).
[512] Grady, 'The AI Act Should Be Technology-Neutral' (n 401) 9.
[513] Bank of England, PRA and FCA, 'FS2/23' (n 533) 6.
[514] Bank of England and FCA, 'Discussion Paper DP5/22' (n 185) 15.

Transparency and Explainable and Responsible AI

Firstly, the UK's approach may benefit from the use of explainable AI ('xAI'): a term coined for the methods and processed used in AI models to allow borrowers, as human users, to both understand and place trust in the outcomes reached by ML algorithms).[515] This may be beneficial as the systems and algorithms could be designed with the intention of being: 'interpretable' to increase consumer understanding of AI; 'transparent' though consumer accessibility to the data and algorithmic design itself; 'explainable' and 'justifiable' as to the decisions made and reasons why; and 'contestable' with the intention of empowering consumers through providing the necessary information required to appeal the decision reached.[516]

For example, xAI has the potential to aid black box algorithms by adopting two different approaches. Firstly, the use of xAI is beneficial as it encourages the development of AI algorithms and systems that are both transparent interpretable to consumers in design, which helps by limiting both the complexity and design of the system to encourage transparency and strengthen consumer understanding.[517] Secondly, xAI uses a secondary approach with the intention of examining exactly how the first 'black box' algorithm works, for example by re-running the initial system with changed inputs, where the purpose of this is to gain a deeper understanding of black box algorithms themselves.[518] Overall, designing AI algorithms and systems with these intentions in mind is fundamental, where effective regulation for ACS should take steps to ensure that AI is transparent and explainable in the interests of both borrowers and lenders.

In addition, AI must also be designed to be responsible, where the intention of this is to reflect 'human-centered values' on the basis that AI remains fair, explainable and reflective of the values and norms the algorithm is intended to serve.[519] This design approach could be beneficial for all parties involved, as lenders would be empowered to use AI and ML

[515] IBM, 'What is explainable AI?' <https://www.ibm.com/topics/explainable-ai> accessed 8 July 2024.
[516] Bundy et al (n 84) 8.
[517] Ibid, 12.
[518] Ibid, 12.
[519] Ritu Jyoti, 'White Paper: Why AI Governance Is a Business Imperative for Scaling Enterprise Artificial Intelligence' (IDC and IBM 2023) 2.

technologies for their benefit, whilst this provision could provide for borrowers to have increased trust and confidence in the use of AI.[520]

Disclosure Requirements

Secondly, it is argued that there should be a requirement for disclosure and for specific guidance regarding the use of alternative data and the algorithms used to ensure explainability in algorithmic decision making. If implemented, requirements for disclosure may have the benefit of being binding in nature, which can aid in ensuring fairness and transparency.

Furthermore, this measure should be focused on the protection of borrowers as consumers, whilst addressing the reality and nature of the consumer credit market from the lender's perspective.[521] In practice, this means that the disclosure of information to borrowers should be both clear and palatable to aid in mitigating the information asymmetry arising between lenders and borrowers whilst recognising the need for lenders to protect their proprietary rights.[522] These conflicting interests must be balanced through careful regulation to address the information asymmetry facing borrowers through ACS, whilst balancing this against protecting the proprietary rights of lenders.

A need for accountability follows alongside this, where this may promote understanding amongst borrowers, who may want the option to amend the data used by the AI system or to be able to be referred to a human to challenge the decision. However, as AI and ML technology continues to develop, this is more burdensome for both users and providers of systems alike, where a suitable alternative does not seem clear at this stage and may require increased regulatory governance to step in to address this gap.[523]

Issuing Clear Rules and Guidelines

Thirdly, the solution in response is to issue clear, enforceable rules for the transparency and interpretability of algorithms which can aid consumer trust. These rules must be binding to allow them to empower borrowers and ensure the use of ACS can achieve its aim of supporting the overall functioning of the consumer credit market. Therefore, regulatory intervention is

[520] Ibid, 2.
[521] Campbell et al (n 48) 103-107.
[522] Ibid, 103.
[523] Lucy Farrow, Alice Haywood A and Darragh McHenry, 'CDEI – AI Governance' (Britainthinks 2022) 51.

crucial here, where a careful balance must be struck to ensure that business practices and trade secrets are respected for lenders, whilst practicality in business is balanced against the need for transparency, interpretability and overall consumer trust.[524] To achieve this aim, regulators should be encouraged to clearly outline their role, whilst establishing clear responsibilities and standards that lenders must be adhered to.[525]

Additionally, it is important that when algorithms are particularly complex to explain, yet remain justifiable in the outcomes produced, further measures must be in place to ensure that the algorithms, input data and outputs produced continue to perform in line with the expectations of lenders.[526] This, in turn, will allow algorithms to be used to benefit credit scoring, whilst ensuring that transparency and interpretability remain at the heart of the use of ACS to encourage consumer trust.

Ensuring the Proportionate Use of Personal Data

Fourthly, it is vital that clear guidelines and expectations are established by financial regulators to ensure that the algorithms used are designed and maintained in the interests of transparency and interpretability for borrowers.[527] Through increased regulation in the interests of improving consumer trust, borrowers are able to feel both empowered and confident in the state and condition of the consumer credit market in the UK. In response, an appropriate balance must be determined as to the exact amount of disparate impact to borrowers that would be tolerable when ACS is used.[528] Without regulatory involvement, this creates a challenge for lenders to establish a universally accepted answer as to the types of data analysed within credit scoring algorithms.[529]

Therefore, regulatory intervention is necessary due to the complexity of this debate to effectively draw the line as to what is both fair and proportionate as to how personal data can

[524] Bundy et al (n 84) 21.
[525] Ward and McNaughton Nicholls, 'Financial Services firms' personal data use' (n 78) 33.
[526] Roberts T et al, 'Credit Scoring Approaches Guidelines' (n 15) XII.
[527] The regulatory response needed and proposals for reform will be discussed in chapter 5.
[528] Solon Barocas and Andrew D. Selbst, 'Big Data's Disparate Impact' (2016) 104 California Law Review 671, 728.
[529] Maria Fernandez Vidal and Jacobo Menajovsky, 'Algorithmic Bias in Credit Scoring: What's Inside the Black Box?' (*CGAP*, 5 September 2019) <https://www.cgap.org/blog/algorithm-bias-in-credit-scoring-whats-inside-black-box> accessed 19 June 2024; and Ward and McNaughton Nicholls, 'Financial Services firms' personal data use' (n 78) 5.

be used ethically in risk-based decision making. There is also a risk that too much data can become inefficient, resulting in the 'over-investment' of data which may have consequences of bias and lack of reliability if the volume of data accessible becomes unmaintainable.[530] In response, further clear and binding guidelines must be issued by regulators to establish principles of fairness and proportionality to address ACS specifically.[531] This should encourage transparency from lenders, where this disclosure of information would be highly beneficial to help borrowers feel empowered and have trust and confidence in the outcomes and processes of algorithmic decision making in ACS.

Furthermore, outlining the impact and limitations of this on individuals with protected characteristics is crucial, aided by requiring evidence of bias or harm not occurring to be proven, outlining exactly what the nature of the evidence necessary to prove this would be.[532] In response, the role of regulation here is to help encourage consumer trust surrounding the use of ACS by addressing the vital challenge of determining what constitutes a proportionate use of personal data.

5.4.6 *The Costs of Increased Regulation of Algorithmic Credit Scoring*

Ultimately, the overarching goal of financial regulation is to apply an analytical approach of economics to determine a suitable legislative and regulatory framework that can correct the failures within a financial system.[533]

In the context of ACS, it is argued that intervention through financial regulation is necessary, as the consequences of issues outlined may not be visible for years or decades to come, resulting in greater costs and complexity in correcting market failures is far greater.[534] However, a careful balance must be struck here when determining the regulatory approach taken, as whilst correcting market failures is important to ensure financial markets are able to function efficiently, the costs and trade-offs of remedying these failures may outweigh the potential benefits.[535]

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[530] Aggarwal, 'The Norms of Algorithmic Credit Scoring' (n 16) 60.
[531] Ward and McNaughton Nicholls, 'Financial Services firms' personal data use' (n 78) 4.
[532] Ibid, 34.
[533] Armour et al (n 184) 51.
[534] Ibid, 51.
[535] Ibid, 52.

Overall, it is argued that the regulatory approach taken should be clear and proportionate in response to the risks arising from ACS. To achieve this, building and maintaining consumer trust must remain a priority in driving regulation forwards, which must be balanced alongside the need to support technological innovation and building confidence in innovation.[536] Efforts must be taken to balance the impact of consumer protection through more immediate regulatory action taken, against potential challenges to the market in addressing the risks that have been identified. In doing so, the conflict between the normative and regulatory goals can be minimised, where relevant conflicting interests are balanced carefully by regulators. For example, there is a risk of regulatory barriers to financial innovation, where innovators may feel discouraged from innovation and entrepreneurship from time and costs of onerous registration and compliance with regulation and potential consequences of non-compliance.[537]

In addition, regulation should encourage the financial innovation surrounding ACS, whilst being aware that clear standards and principles must be established and upheld to ensure consistent standards of regulation are enforced.[538] Here, a balance should be struck when regulating ACS between both innovation and risk: taking advantage of the opportunities ACS presents whilst taking action to mitigate potential risk.[539] In practice, this should mean that the regulatory approach adopted must balance and protect the need for integrity in financial services and data privacy, for example by protecting consumers from discrimination, whilst encouraging innovation in the use of AI and ML in consumer creditworthiness assessments (capturing the benefits of this technology).[540]

Furthermore, innovation through ACS should be embraced by regulators, whilst ensuring that safety and the interests of borrowers remains at the forefront of the design and implementation of these algorithms; adapting regulation to suit and taking a pro-active approach where industry is the focus.[541] Developing consumer trust, where innovation safety is prioritised at the

[536] Department of Digital, Culture, Media and Sport, *Establishing a pro-innovation approach to regulating AI* (CP 728, 2022) 5.
[537] Philip Treleaven, 'Financial regulation of FinTech' (2015) 3(3) The Journal of Financial Perspectives: FinTech 1, 8; and Kevin Houstoun, Alistair Milne and Paul Parboteeah, 'Preliminary Report on Standards in Global Financial Markets' (Updated 2015) Loughborough University Working Paper <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2531210> accessed 11 July 2024.
[538] Campbell et al (n 48) 108.
[539] Roberts T et al, 'Credit Scoring Approaches Guidelines' (n 15) XIII.
[540] Ibid, XIII.
[541] Fairclough (n 256) 11.

forefront of these technological developments, ensures a safer, smoother transition for the market.[542] Additionally, as the financial system is subject to continuous change, it is worth noting that the performance of the functions of the consumer credit market are not static.[543] Therefore, regulators must address the dynamic nature of ACS through regulation to allow the technology of ACS to evolve, by being able to respond to both changes in the market and to the regulation itself, whilst balancing consumer interests and protection in the meantime.[544] To achieve this, regulators must work with innovators to ensure that concerns of over regulation are addressed, where innovation is not stifled but consumers interests are protected through the use of ACS.

5.5 Conclusion

In conclusion, this chapter has argued that the UK's regulatory framework for consumer credit as it applies to ACS is insufficient, where proposals and measures for reform have been made in response. On the one hand, it has been argued that the UK's pro-innovation approach to AI that builds upon this framework is flexible and supportive of innovation, where sector-specific regulation can be beneficial to borrowers as consumers. On the other hand, it has been argued that reform is necessary to target the specific risks of ACS through enshrining this framework in legislation to ensure that it is binding, and introducing stricter, more stringent controls to directly address ACS. Overall, it is argued that increased regulation is necessary to improve the UK's approach to regulating ACS, even if that should not drive the UK to go quite as far in its approach to AI-driven innovation as the EU has.

[542] UL Solutions, 'Innovation and Safety in a New Decade: 2020' (2020) <https://www.ul.com/insights/innovation-and-safety-new-decade-2020> accessed 18 June 2024.
[543] Armour et al (n 184) 12.
[544] Ibid, 12.

Conclusion

This thesis has provided a comprehensive analysis of the rise of ACS within the context of the UK's consumer credit market and financial regulation. Throughout this thesis, the rise of ACS has been explored, where it has been discussed how ACS has arisen from advancements in AI and ML, which represents a fundamental shift from traditional credit scoring models by utilising and accessing increased volumes and varieties of data, whilst using increasingly sophisticated and complex algorithms to do so. It has been identified how ACS presents itself as a 'double-edged sword': offering both significant benefit and significant risk hand in hand.[545]

On the one hand, it has been explored how this innovation offers significant benefit to the overall functioning of the consumer credit market, including increased access to credit and enhanced financial inclusion, and increased accuracy and efficiency in the algorithms used. On the other hand, it has been explored how ACS presents significant risks, namely the risk of exploitation of vulnerable borrowers, the lack of transparency and interpretability of the algorithms used, and the potential for algorithmic bias and subsequent discrimination.

Overall, this thesis argues in favour of more effective regulation to strike a sufficient balance between harnessing the benefit of ACS and mitigating its risks. To make this argument, the first chapter established how traditional credit scoring methods have evolved towards ACS, first identifying its double-edged nature. The second chapter then moved to discuss the benefits and risks associated with ACS, highlighting how ACS has the potential to improve consumer creditworthiness assessments, whilst exploring the risks that follow. The third chapter concluded that regulation was necessary, where the normative goals and challenges of financial regulation and ACS-specific risks were examined, focusing on the conflicts between allocative efficiency, distributional fairness, consumer trust, and the potential trade-offs to consumer privacy and autonomy, and innovation at the heart of ACS. The fourth chapter then moved to outline the UK's regulatory framework for consumer credit, followed by outlining how the UK's approach to AI aims to address the gaps and be applied in the context of ACS. The EU's bold, legislative approach was then analysed as an alternative. This was vital to lay the foundation for our final chapter.

[545] Aggarwal, 'Algorithmic Credit Scoring and the Regulation of Consumer Credit Markets' (n 6).

Building upon the framework of analysis established in the previous chapters, the fifth and final chapter engaged with the overarching question of this thesis: whether the UK's current regulatory approach is sufficient to harness the benefits whilst mitigating the risks or whether further reform is necessary. In evaluating the UK's regulatory framework for consumer credit, it was argued that whilst the existing measures do extend to ACS, this proved insufficient, prompting further regulatory intervention to specifically address the risks associated with the use of ACS, to allow its benefits to be maximised.

The UK's approach to AI was assessed following this, to determine whether or not this was a sufficient resolution and whether it was sufficient in the context of ACS. It was argued that this approach has some key strengths, where it was flexible and supportive of innovation. At the same time, it was concluded that this approach proved insufficient without legislative backing, on the basis that it is not binding and offers no new powers to regulators. Without binding legislation, there is a risk that lenders may prioritise their own interests above those of borrowers, which could potentially result in market abuse through opportunities for exploitation. The absence of new regulatory powers further limits the ability of regulators to maintain oversight of the consumer credit market in relation to ACS. Therefore, it was concluded that this approach is useful in theory, yet its implementation in practice may be limited by lack of binding legislation and regulators lacking new powers.

The comparative analysis that followed focused on whether the UK should have followed in the EU's footsteps by adopting a far bolder approach to the regulation of ACS, where the EU adopted a more stringent regulatory regime by categorising ACS as a high-risk application.[546] Yet, this may come at a potential cost to innovation. Therefore, this thesis argues for reform, where a balance must be struck between both approaches. This prompted discussion as to how reform can be carried out, where proposals for reform were made to determine how the UK can make its regulatory approach to ACS more effective. This would need to be done by allowing the benefits of ACS to be harnessed to support the overall functioning of the consumer credit market, whilst ensuring that the risks involved are mitigated. At the same time, the trade-offs and costs of regulation must remain low in relation to both consumer privacy and autonomy and innovation, where a balance must be struck between the two to offer appropriate protection to borrowers when ACS is used whilst avoiding stifling innovation.

[546] AI Act (n 9).

Ultimately, it is argued that whilst ACS holds the potential to improve consumer creditworthiness assessments, improving access to data and credit and therefore financial inclusion, to reap these benefits, it must be regulated effectively in a way that addresses its inherent risks and ensures consumer protection is not a cost. The UK's regulatory approach must be reformed to ensure that ACS is used responsibly and to the advantage of supporting the overall functioning of the consumer credit market by improving consumer creditworthiness assessments whilst minimising harm and trade-offs to consumer privacy and autonomy. Effective regulation is essential to foster consumer trust and prevent the exploitation of vulnerable groups, where this will ensure that the benefits of ACS outweigh its risks in the long term. Overall, it is argued that the UK has taken the correct step forward in adopting a pro-innovation, vertical and sector-specific approach. However, this approach needs legislative backing as a statutory framework, along with introducing new powers and controls for regulators. By doing so, it is hoped that these proposals might improve the UK's approach to regulating ACS moving forwards.

Finally, it is noted that as AI and ML develops so quickly, effective regulatory proposals for now may become redundant in future. As such, a crucial aspect of these proposals rests on ensuring regulation is future-proof and flexible. This is a significant challenge for regulators that will require refinement and adaptation over the years, which must be mitigated by having a robust yet flexible framework in place to utilise the benefits of ACS, whilst striking a balance between supporting future innovation. Ultimately, the most appropriate and proportionate approach to the regulation of ACS cannot be entirely predicted at this stage, but the findings in this thesis are hoped to guide policymakers and regulators as they attempt to strike the balance for ACS.[547]

[547] Geraldine Scali, Pierre-Emmanuel Froge and Jack Dunn, 'Europe: UK vs EU approach to regulating AI' (*OneTrust Data Guidance*, October 2022) https://www.dataguidance.com/opinion/europe-uk-vs-eu-approach-regulating-ai> accessed 29 July 2024.

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