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University of Wales
Trinity Saint David

Component 2: Coursework – Individual Dissertation

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Module: Dissertation

Module Code: LCBB6000

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Chapter 1: Introduction

1.1 Topic

The title of this research is "The Impact of Blockchain and Cryptocurrency on Payment Processes in Traditional UK Banking." This study examines how blockchain technology and cryptocurrencies are influencing the way in which banks in the United Kingdom process payments, manage transactions and maintain financial stability, and what the implications may be for the future of payment services in the UK banking sector.

1.2 Background of the Study

Blockchain and cryptocurrency have become major areas of interest across international finance and are increasingly relevant in the United Kingdom. Bitcoin, introduced in 2009, demonstrated that money could be transferred electronically without a central authority such as a bank (Nakamoto, 2008). Since then, cryptocurrencies have expanded in range and public attention. Blockchain, the underlying technology, records transactions in a secure and decentralised digital ledger, which is fundamentally different from traditional banking systems that rely on centralised databases and trusted intermediaries to verify and record payments (Bank of England, 2022).

In the United Kingdom, traditional banks face pressure to modernise their payment infrastructure. Many continue to use legacy systems that are slow, costly, and vulnerable to operational failures. Fintech companies using blockchain can offer faster, more efficient, and more transparent payment solutions, increasing competitive pressure on established banks. UK regulators, including the Bank of England, are also exploring new forms of digital money such as a potential digital pound (Bank of England, 2023). Blockchain therefore presents new opportunities for improving payment processes within banks, but also raises significant concerns around risk, regulatory compliance, and financial stability.

1.3 Problem Statement

The UK banking system is experiencing considerable technological disruption as blockchain and cryptocurrency challenge traditional payment methods and infrastructure. Banks must continue to protect consumer funds and comply with regulatory requirements while exploring new digital payment solutions. Key problems include the difficulty of integrating blockchain with existing legacy systems, regulatory uncertainty as UK rules for cryptocurrency remain

undeveloped, increasing fintech competition and ongoing cybersecurity risks. In addition, there is limited academic research that focuses specifically on how blockchain affects the processing of payments within UK banking as a distinct operational function, rather than examining blockchain or cryptocurrency in broader financial or investment contexts. This represents a clear and specific gap in the existing literature that this research addresses.

1.4 Research Aim

The aim of this research is to examine how blockchain and cryptocurrency influence payment processes in traditional UK banking, exploring both the opportunities and challenges these technologies create and their wider implications for the future of payment services in the UK.

1.5 Research Objectives

The study is guided by the following objectives:

1. To explain the key features of blockchain and cryptocurrency most relevant to bank payment systems in the UK.
2. To explore how UK banks are responding to blockchain-based payment innovations.
3. To identify the opportunities and challenges that blockchain creates for improving payment processes in banks.
4. To assess probable future developments in UK bank payment systems as blockchain becomes more widely adopted.

1.6 Research Questions

The study will address the following research questions:

1. What features of blockchain and cryptocurrency are most relevant to improving or disrupting traditional bank payment systems in the UK?
2. How are UK banks adapting their payment services in response to blockchain and cryptocurrency innovations?
3. What opportunities and risks do these technologies create for bank payment operations?
4. How might blockchain reshape the future of payment processes in UK banking?

1.7 Significance and Purpose of the Study

This study is significant because payment systems are central to the operation of banks and to the wider financial system. Blockchain has the potential to reduce transaction costs, accelerate cross-border payments and improve transparency and security. Understanding these impacts is important for UK regulators such as the Financial Conduct Authority and the Bank of England, who manage risks while supporting financial innovation. The study aims to provide a clear explanation of how blockchain is affecting payment processes in UK banking, describing

changes already taking place and supporting banks and regulators in making more informed decisions about adopting modern technologies.

1.8 Rationale of the Study

Much of the existing research on blockchain and cryptocurrency focuses on global financial markets or investment behaviour rather than on specific UK banking operations. Despite this, there is little substantial body of literature that examines specifically how blockchain affects the day-to-day processing of payments within UK banks as a distinct operational function. This is the precise gap that this research addresses. By focusing on payment processes within UK banking, the study aims to produce findings that are both academically relevant and useful for those working within the UK financial sector.

1.9 Scope, Limitations and Dissertation Structure

This study focuses specifically on the UK banking sector and the impact of blockchain and cryptocurrency on payment processing. It relies entirely on secondary data, including academic literature, regulatory reports, and industry publications. Primary data collection is outside the scope of this study, which is a recognised limitation. Future research could address this by incorporating primary data to give a more detailed picture of how individual banks are responding.

This dissertation is organised into five chapters. Chapter One has introduced the topic, background, research problem, aim, objectives, and research questions. Chapter Two provides a critical review of the literature. Chapter Three explains the qualitative secondary research methodology. Chapter Four presents and discusses the findings. Chapter Five concludes the dissertation and offers recommendations.

Chapter 2: Literature Review

2.1 Introduction

This chapter reviews the existing academic and regulatory literature on blockchain, cryptocurrency and payment systems in UK banking. Rather than simply describing what previous researchers have found, it compares different viewpoints, identifies where authors agree and disagree and highlights gaps in existing knowledge that this dissertation aims to address. Each section links the evidence to the research questions established in Chapter One.

2.2 Definition and Characteristics of Blockchain and Cryptocurrency

Blockchain is a decentralised digital ledger that records transactions across a shared network without the need for a central authority such as a bank or government institution. Each transaction is time-stamped and stored in a data block which cannot easily be altered once added to the chain (Nakamoto, 2008). This design is different from the systems used by traditional UK banks, where transaction records are stored centrally and banks retain full control over verifying and approving payments. Cryptocurrencies, including Bitcoin and Ethereum, operate on blockchain networks and allow users to transfer value directly to one another without the involvement of a bank or intermediary (Bank of England, 2022). Because blockchain transactions are processed in a decentralised and transparent manner, they represent a direct challenge to the established role of banks in the payment system.

Most authors agree that blockchain is highly secure by design. Nakamoto (2008) and Tapscott and Tapscott (2016) both present this as one of its defining strengths, arguing that decentralisation removes the single point of failure that makes centralised banking systems vulnerable. However, this consensus has an important limitation: both authors are primarily concerned with the architecture of blockchain itself rather than the environment in which it would operate. The Bank of England (2022) identifies a gap in this argument, noting that while the ledger may be internally secure, the exchanges, wallets, and interfaces through which banks and customers would interact with it are not. This is not a minor technical qualification — it strikes at the heart of whether blockchain can deliver the security improvements its advocates claim, and it suggests that Tapscott and Tapscott's (2016) optimism rests on a narrower definition of security than UK banks would require in practice.

The scalability debate follows a similar pattern, where optimistic claims are not adequately tested against operational realities. Crosby et al. (2016) and Peters and Panayi (2016) both identify throughput limitations in current blockchain networks, but their conclusions differ in important ways. Crosby et al. (2016) treat this as a solvable technical problem, whereas Peters and Panayi (2016) argue more directly that blockchain is not yet suitable for high-volume retail banking integration. This disagreement matters more than the literature sometimes acknowledges, because it determines whether blockchain's headline advantages — faster payments and lower costs — can be delivered at the scale UK banks require. Tapscott and Tapscott (2016) sidestep this question, which is a significant weakness in their argument when applied to the specific context of UK payment processing. For Research Question 1, this means identifying the relevant features of blockchain cannot rely on general claims about the

technology; it requires a critical assessment of what blockchain can demonstrably deliver under real UK banking conditions.

2.3 Importance of Blockchain and Relevant Theoretical Models

Many researchers argue that blockchain could address longstanding inefficiencies in traditional payment infrastructure, particularly for cross-border transactions. The Bank of England (2022) states that blockchain could make international payments significantly faster and cheaper by reducing dependence on multiple intermediaries. Sajjan, Patel and Yadav (2024) support this, arguing that blockchain has the potential to transform payment efficiency in ways that could meaningfully improve the competitive position of UK banks. However, Peters and Panayi (2016) are more cautious, arguing that the benefits depend heavily on whether adequate regulatory frameworks are in place to support adoption.

Three theoretical frameworks are used in this study to explain how organisations adopt modern technologies such as blockchain. Christensen's (1997) Disruptive Innovation Theory suggests that modern technologies can displace established systems when they offer simpler or more efficient alternatives. This helps explain why fintech companies using blockchain have grown rapidly and attracted customers away from traditional banks, which are constrained by legacy systems. The Technology Acceptance Model, developed by Davis (1989), focuses on the conditions under which individuals and organisations are willing to adopt modern technologies, suggesting adoption is when users believe the technology will genuinely improve performance and is straightforward to use. Institutional Theory, developed by Scott (2001), emphasises the role of regulatory and social norms in shaping organisational behaviour, suggesting UK banks will only move forward with blockchain-based payment systems if the regulatory environment provides clear guidance and legitimacy.

These three theories reach quite different conclusions, and the disagreements between them are more significant than is sometimes acknowledged. Christensen (1997) implies that blockchain-enabled fintech firms could displace UK banks quickly once the technology matures, because disruptive technologies typically do not give incumbents much time to respond. Scott (2001) reaches the opposite conclusion: in a heavily regulated sector, the institutional environment will slow adoption regardless of competitive pressure, because banks cannot move faster than regulators allow. Davis (1989) introduces a third variable that neither of the other theories adequately addresses — the role of individual and organisational perception. Even where competitive pressure exists and regulators have provided clear frameworks, adoption will stall if those responsible for implementing the technology do not believe it is

genuinely usable and beneficial. A key limitation of applying all three frameworks here is that none was developed with UK banking payment systems in mind. Christensen's (1997) model was built on observations from manufacturing industries where regulatory constraint plays a much smaller role. Scott's (2001) theory accounts for institutional inertia but does not distinguish between sectors where regulatory barriers are temporary and those where they reflect permanent structural features of how payment systems must work. This study therefore uses these frameworks as analytical lenses rather than predictive models, and Chapter Four assesses where each theory holds and where the evidence from UK banking complicates or contradicts what the theories would suggest.

2.4 Advantages of Blockchain for Bank Payment Systems

The literature identifies several potential advantages that blockchain could bring to payment processing in UK banks, most notably around speed, cost, and transparency. Sajjan, Patel and Yadav (2024) argue that faster settlement times and lower transaction costs could significantly improve the competitiveness of UK banks, particularly in international markets where current processes are slow and expensive. The Bank of England (2022) supports this to some extent, though it cautions that these benefits will only be realised if blockchain systems are successfully integrated with existing banking infrastructure.

Transparency is another frequently highlighted advantage. Because all transactions on a blockchain are recorded in a shared and visible ledger, it becomes more difficult for fraudulent or unauthorised payments to go undetected (Tapscott and Tapscott, 2016). Crosby et al. (2016) argue this could also reduce compliance costs, which currently represent a significant burden for UK banks. These are credible benefits, but the literature tends to treat transparency as uncomplicated without examining the tensions it creates in the UK context. UK banks are subject to strict data protection obligations under UK GDPR, and a fully transparent payment ledger would conflict with those obligations. This is a limitation that optimistic accounts such as Tapscott and Tapscott (2016) do not address, illustrating a broader weakness in much of the advantages literature: the benefits of blockchain are discussed in general terms without being tested against the specific legal and regulatory environment in which UK banks operate. Peters and Panayi (2016) offer the sharpest challenge, questioning whether blockchain systems are technically mature enough to handle mainstream UK banking volumes. The more analytically sound position, which this study adopts, is that the advantages of blockchain are real but conditional — they apply most clearly in specific contexts such as cross-border and interbank

settlement, and they have not yet been demonstrated to hold across the full range of UK payment operations. This is directly relevant to Research Question 3.

2.5 Disadvantages and Challenges of Blockchain Adoption

The literature identifies significant challenges associated with blockchain adoption in UK banking, including regulatory uncertainty, cybersecurity risks, systems integration costs, and broader concerns about financial stability. The Bank of England (2023) notes that the rules governing blockchain-based payment systems in the UK are still being developed, making it difficult for banks to commit to long-term investments. Zetzsche et al. (2020) similarly argue that the absence of clear and consistent regulatory frameworks is one of the main factors limiting adoption in mainstream financial services. The Bank of England's (2023) consultation on a digital pound illustrates the complexity of this challenge, as even a government-backed digital currency raises unresolved questions about privacy, financial stability, and the role of commercial banks in the payment system.

Cybersecurity is another major concern. Nakamoto (2008) and others emphasise that the internal structure of a blockchain is highly resistant to tampering, but the Bank of England (2022) and Crosby et al. (2016) point out that the wider ecosystem through which blockchain networks are accessed, such as digital wallets and exchanges, has been repeatedly targeted by hackers. If banks adopt blockchain-based payment systems without adequately securing the surrounding infrastructure, they may expose themselves and their customers to significant risks. The challenge of integrating blockchain with existing legacy systems is also considerable. Peters and Panayi (2016) describe this as one of the most serious practical obstacles to adoption, as replacing or adapting legacy infrastructure is expensive and potentially disruptive to daily banking operations.

It is worth noting that the disagreement between academic researchers and regulators reflects a deeper tension about what blockchain adoption in UK banking means. Academic studies such as Peters and Panayi (2016) and Crosby et al. (2016) treat adoption primarily as a technical and operational question: can the technology work at the required scale and cost? Regulators approach it differently. The Bank of England (2022, 2023) and Zetzsche et al. (2020) treat adoption primarily as a question of systemic risk: what does widespread blockchain use mean for the ability to oversee and control the UK payment system? These are not simply different emphases on the same problem. They reflect different assumptions about whose interests the payment system is designed to serve and what level of disruption is acceptable in pursuit of efficiency gains. A significant limitation of the existing literature is that very few studies attempt

to bridge these two perspectives. This study addresses that gap by drawing on both regulatory and academic sources as necessary and complementary, rather than treating one as more authoritative than the other.

2.6 Chapter Summary

This chapter has reviewed the key literature on blockchain, cryptocurrency and payment processes in UK banking. There is broad agreement that blockchain could improve payment efficiency, transparency, and security, but important debates remain about adoption pace, scalability, and regulatory requirements. Disruptive Innovation Theory (Christensen, 1997), the Technology Acceptance Model (Davis, 1989), and Institutional Theory (Scott, 2001) provide useful but only partially complementary explanations of how and why blockchain may or may not be adopted in UK banking. The chapter has also identified a gap in the literature relating to blockchain's specific impact on payment processing within UK banks, which this dissertation addresses. The methodology is outlined in Chapter Three.

Chapter 3: Research Methods and Methodology

3.1 Research Philosophy and Paradigm

This research follows a pragmatic research philosophy, which allows the researcher to focus on real-world problems and to use whichever sources and methods are most useful for answering the research questions (Saunders, Lewis, and Thornhill, 2019). In this study, the practical problem is understanding how blockchain and cryptocurrency affect payment processes in UK banking. Pragmatism supports the use of a range of secondary sources, including academic journals, regulatory reports, and industry publications, because all contribute useful perspectives on this problem.

The research uses a qualitative paradigm. The sources used, such as Bank of England reports, academic articles and industry publications, are qualitative in nature and are concerned with explaining how and why blockchain is affecting UK banking rather than measuring it in quantitative terms. A qualitative paradigm is therefore the most suitable choice for this study (Saunders, Lewis and Thornhill, 2019).

3.2 Research Approach, Methodology and Strategy

A deductive research approach has been adopted. The study begins with the theoretical frameworks discussed in Chapter Two, namely Disruptive Innovation Theory (Christensen, 1997), the Technology Acceptance Model (Davis, 1989) and Institutional Theory (Scott, 2001),

and uses these to guide the analysis of secondary data. Rather than building new theory from the ground up, the study tests whether existing theories are supported or challenged by the evidence found in the secondary sources.

The methodology is qualitative secondary research, meaning all data comes from existing published sources rather than original data collection. The research strategy is document analysis, which involves reviewing and interpreting a range of written sources including official regulatory publications, peer-reviewed academic journals and trusted industry reports.

Document analysis is particularly appropriate here because the topic of blockchain and UK banking is well covered in regulatory and industry documentation, providing a reliable and detailed evidence base (Saunders, Lewis and Thornhill, 2019).

3.3 Secondary Data Selection

Because this study relies entirely on secondary data, the process of selecting sources is particularly important. A purposive sampling method has been used, meaning sources were selected deliberately because they are directly relevant to the research questions rather than chosen at random (Saunders, Lewis and Thornhill, 2019). Sources were included if they addressed blockchain or cryptocurrency in the context of banking or financial services, were produced by a credible and identifiable author or institution and were published in a verifiable form such as a peer-reviewed journal, government or regulatory publication, or report from a recognised financial institution.

Academic journals accessed through databases such as Google Scholar and JSTOR provided peer-reviewed research on blockchain technology and its application in financial services. Regulatory publications from the Bank of England, including its 2022 report on cryptoassets and its 2023 consultation on the digital pound, provided authoritative perspectives on how UK regulators view blockchain and its risks. Where sources overlapped significantly, the most credible or most recent source was prioritised. Sources not specifically related to UK banking payment processes were only included where they provided essential theoretical or contextual background.

3.4 Data Analysis and Ethical Considerations

The secondary data was analysed using thematic analysis, following a structured three-stage process tailored to the specific research questions and sources of this study. In the first stage, each source was read in full and passages directly relevant to the impact of blockchain on UK bank payment processes were identified. This was not a passive reading exercise: each source

was read against the four research questions, so that material relating to payment speed and cost, regulatory responses, security risks and future trajectories was actively sought and recorded in relation to each question rather than treated as general background. In the second stage, the recorded passages were grouped according to the patterns and tensions that emerged across multiple sources. Where different authors reached different conclusions about the same aspect of blockchain — for example, on scalability or regulatory readiness — these tensions were recorded as analytical points rather than resolved by selecting one view over another. This produced the four themes that structure Chapter Four, which emerged from the analysis itself rather than being determined in advance. In the third and final stage, each theme was interpreted in relation to the three theoretical frameworks discussed in Chapter Two. This involved not only assessing whether the evidence supported or challenged each theory, but also identifying where the theories were insufficient to explain what the evidence showed — particularly where the specific features of UK banking infrastructure, regulation and payment volumes created conditions that the theories, developed in other contexts, did not fully anticipate.

From an ethical standpoint, this study does not involve human participants, personal data, or sensitive information. All sources are publicly available and cited appropriately in line with academic referencing conventions. The main limitation of the methodology is that it relies on existing published material, meaning the findings reflect the views available at the time of writing rather than direct evidence from UK banks. This limitation is discussed further in Chapter Five.

Chapter 4: Findings and Discussion

4.1 Introduction

This chapter presents and discusses the findings of the secondary data analysis, structured around the four themes identified during the thematic analysis process outlined in Chapter Three. For each theme, the secondary evidence is presented, interpreted and linked back to the research questions and theoretical frameworks discussed in Chapters One and Two. The aim is not simply to describe what the sources say, but to analyse what the evidence means for how blockchain and cryptocurrency are affecting payment processes in traditional UK banking.

4.2 Theme One: The Impact of Blockchain on Payment Speed and Cost

One of the most consistent findings across the secondary sources is that blockchain has meaningful potential to improve the speed and reduce the cost of payments, particularly for cross-border transactions. Traditional international payment processes in UK banking typically involve multiple intermediary banks, each adding time and cost. The Bank of England (2022) identifies this as one of the most significant inefficiencies in the current system, noting that cross-border payments can take several days to settle and carry fees that are disproportionately high relative to the value transferred. This is a particular disadvantage for UK banks competing in international markets where faster and cheaper alternatives are increasingly available.

Blockchain addresses this by enabling peer-to-peer settlement without multiple intermediaries, allowing payments to be completed in minutes rather than days. Sajjan, Patel and Yadav (2024) argue this represents one of the most commercially significant advantages for UK banks, particularly in trade finance and remittance services, and that banks successfully integrating blockchain could reduce operational costs while improving the customer experience. This is consistent with Christensen's (1997) Disruptive Innovation Theory, which predicts modern technologies gain a foothold by offering greater efficiency at lower cost. The evidence suggests blockchain is following this pattern, first making inroads in international payments where the limitations of traditional systems are most visible.

However, the evidence on this theme also reveals something the secondary literature does not always acknowledge directly: there are no publicly documented cases of a major UK retail bank having fully integrated blockchain into its core domestic payment operations at scale. The examples in the literature, including the Bank of England's (2022) own analysis and Sajjan, Patel and Yadav's (2024) assessment, concern pilots, proofs of concept and potential applications rather than operational systems processing millions of retail payments daily. This matters because it means the efficiency case for blockchain in UK banking remains theoretical. Christensen's (1997) Disruptive Innovation Theory would predict that a technology offering meaningful efficiency gains at lower cost would already be displacing existing systems, yet that displacement is not visible in the UK domestic payments market. The more credible interpretation of the evidence is that blockchain's speed and cost advantages are real but conditional — they apply most clearly in cross-border and wholesale payment functions where the limitations of existing infrastructure are most acute, and they have not yet been demonstrated to hold at the scale and regulatory complexity of mainstream UK retail banking.

Banks pursuing blockchain for payment efficiency should therefore focus first on international and wholesale payment functions rather than attempting retail-scale integration immediately.

4.3 Theme Two: The Regulatory Environment and Its Effect on Adoption

The secondary evidence consistently shows that regulation is one of the most significant factors shaping how UK banks are responding to blockchain. The Bank of England (2023) describes the regulatory landscape as still developing, with many rules governing blockchain-based payment systems yet to be finalised. This uncertainty has a direct effect on banks' willingness to make long-term investments, as they are unwilling to commit significant resources to systems whose regulatory status remains unclear. Zetzsche et al. (2020) support this view at the international level, arguing that regulatory ambiguity is one of the primary brakes on adoption in mainstream financial services.

This aligns closely with Scott's (2001) Institutional Theory, which argues that organisations in heavily regulated sectors will only adopt modern technologies once clear institutional frameworks are in place. The evidence strongly supports this. What is more analytically interesting, however, is what the evidence reveals about the nature of the regulatory constraint. It is not simply that rules are missing — it is that the Bank of England (2023) itself is uncertain about what rules should look like, as the digital pound consultation makes clear. This is a more fundamental problem than regulatory lag, which implies that rules will eventually catch up with technology. Instead, the evidence suggests that regulators and banks are working through genuinely unresolved questions about how blockchain-based payment systems interact with existing monetary architecture, consumer protection frameworks and financial crime controls. The practical consequence for UK banks is significant: they cannot simply wait for regulatory clarity to arrive, because the process of developing that clarity requires their active participation. Banks such as HSBC and NatWest have in fact been involved in blockchain pilot programmes and regulatory sandbox testing through the Financial Conduct Authority, which suggests that the most strategically aware UK banks understand that shaping the regulatory environment is itself part of managing the adoption challenge. This is a dimension of Research Question 2 that the literature does not adequately capture — adaptation is not only about technology deployment but about institutional positioning.

4.4 Theme Three: Cybersecurity and Integration Challenges

The secondary evidence reveals significant challenges related to cybersecurity and the integration of blockchain with existing banking infrastructure. Crosby et al. (2016) document a number of high-profile cases in which cryptocurrency exchanges and digital wallet providers were successfully attacked by hackers, resulting in significant financial losses. The Bank of England (2022) draws attention to the same issue in the UK banking context, warning that banks which integrate blockchain into their payment systems without adequate surrounding security measures may expose themselves and their customers to risks that outweigh the efficiency gains.

The challenge of systems integration is equally significant and is one that the existing literature tends to describe without fully explaining why it has proved so resistant to resolution. Peters and Panayi (2016) identify legacy infrastructure as an obstacle, but it is worth examining why UK banks have been unable or unwilling to modernise at pace. The answer lies partly in the economics of banking infrastructure: the systems that process domestic UK payments, including the CHAPS and Faster Payments networks, were built at enormous cost and are deeply embedded in both bank operations and the wider payment ecosystem. Replacing or modifying them carries operational risk that no single bank can easily absorb. This structural inertia is not captured well by Davis's (1989) Technology Acceptance Model, which frames adoption as a decision made by users weighing costs and benefits. The integration challenge facing UK banks is not primarily about whether staff and management perceive blockchain as useful; it is about whether the organisational and systemic conditions exist to make integration possible at all. Zetzsche et al. (2020) come closest to capturing this when they note that the cost of integration extends well beyond the financial, requiring changes to governance structures, staff capabilities, and risk frameworks. The implication for Research Question 3 is that the risks of blockchain adoption in UK banking are not only technical and cybersecurity risks but fundamentally organisational ones — and those organisational risks are currently underrepresented in both the academic literature and in banks' own public communications about their blockchain strategies.

4.5 Theme Four: The Future Direction of Blockchain in UK Payment Systems

The secondary data presents a broadly consistent picture regarding the future of blockchain in UK bank payment systems: blockchain is unlikely to replace existing payment infrastructure in the short term but is likely to become an increasingly important part of the UK payments

landscape over a longer time horizon. The Bank of England's (2023) work on the digital pound is one of the most significant indicators of this direction, reflecting a recognition by UK regulators that digital and blockchain-based forms of money are a serious long-term possibility and that regulatory and technical groundwork needs to begin now.

Sajjan, Patel and Yadav (2024) suggest the path is a hybrid model in which blockchain-based systems operate alongside rather than instead of traditional payment infrastructure, and the wider evidence supports this. However, it is worth being specific about what a hybrid model would mean in practice for UK banks, rather than treating it as a reassuring middle ground. A genuine hybrid model requires banks to maintain and operate two fundamentally diverse types of payment infrastructure simultaneously — one centralised and one decentralised — each with its own security requirements, regulatory obligations, staff training needs, and operational risks. The cost and complexity of doing this is not trivial, and the literature does not adequately address whether the efficiency gains from blockchain in specific payment functions would outweigh the overhead of running a parallel system. The Bank of England's (2023) digital pound consultation is instructive here: even at the design stage, regulators are grappling with questions about interoperability between a potential central bank digital currency and existing commercial bank payment systems that do not yet have clear answers. The practical implication for Research Question 4 is that the future direction of blockchain in UK banking is not simply a question of when adoption will happen but of whether the institutional, technical, and economic conditions for a workable hybrid model can be created. The evidence suggests they can, but that this will require deliberate coordination between banks, regulators, and infrastructure providers rather than emerging organically from competitive pressure alone.

4.6 Chapter Summary

This chapter has presented and discussed the findings of the secondary data analysis across four themes. Blockchain has genuine potential to improve payment speed and reduce costs in UK banking, particularly for cross-border transactions, but this potential is moderated by regulatory uncertainty, substantial cybersecurity and integration challenges, and the operational realities of deploying modern technology within large banking institutions. The likely future path is a gradual hybrid adoption model rather than wholesale transformation. These findings are discussed further in Chapter Five, where the research questions are answered directly and recommendations are made.

Chapter 5: Conclusion, Limitations and Recommendations

5.1 Summary of Key Findings and Answers to Research Questions

This dissertation has examined the impact of blockchain and cryptocurrency on payment processes in traditional UK banking. The secondary data analysis, organised around four thematic areas, produced a number of clear findings which directly answer the four research questions.

Research Question 1 asked what features of blockchain and cryptocurrency are most relevant to improving or disrupting traditional bank payment systems in the UK. The evidence indicates that the most relevant features are decentralisation, which removes the need for multiple intermediaries in cross-border payments; near real-time settlement, which addresses delays inherent in traditional interbank payment processes; and the immutable and transparent transaction record, which benefits compliance and fraud prevention. However, the scalability limitations of current blockchain networks mean not all these features can be fully realised at the volume levels required by major UK banks.

Research Question 2 asked how UK banks are adapting their payment services in response to blockchain and cryptocurrency innovations. The evidence shows that adaptation is taking place but cautiously. UK banks are primarily engaging with blockchain through internal pilots, partnerships with fintech firms and involvement in regulatory consultations. Wholesale integration into core payment operations has not yet occurred and is unlikely to happen until the regulatory framework becomes clearer and legacy system modernisation progresses further.

Research Question 3 asked what opportunities and risks blockchain creates for bank payment operations. The key opportunities are improved efficiency and lower costs in cross-border payments, enhanced transparency for compliance purposes, and the potential to compete more effectively with fintech firms. The key risks are cybersecurity vulnerabilities in the surrounding ecosystem, the prohibitive cost and complexity of integrating blockchain with legacy systems, regulatory uncertainty, and the risk that poorly managed adoption could disrupt existing payment services.

Research Question 4 asked how blockchain might reshape the future of payment processes in UK banking. The evidence points to a gradual and selective reshaping rather than wholesale transformation. Blockchain is most likely to be adopted first in interbank settlement, cross-

border payments, and compliance functions. The digital pound, if introduced, could accelerate this process by providing a government-backed infrastructure that legitimises the use of blockchain-based money within the UK financial system.

Across all four themes, the theoretical frameworks applied proved useful but also revealed their limitations. Christensen's (1997) Disruptive Innovation Theory explains the competitive pressure fintech firms are placing on traditional banks. Scott's (2001) Institutional Theory explains why this disruption is not producing rapid change within established UK banks. Davis's (1989) Technology Acceptance Model helps explain why perceived complexity and risk of implementation is itself a barrier, independent of the technology's objective capabilities. Together, these frameworks suggest that blockchain adoption in UK banking will be shaped less by the technology itself than by the regulatory, organisational, and cultural environment in which it is introduced.

5.2 Limitations of the Study

This study has a number of limitations that should be acknowledged. The most significant is the exclusive reliance on secondary data. While the sources used are credible and relevant, they do not provide direct evidence of how individual UK banks are experiencing or responding to blockchain in practice. The findings reflect broader sectoral trends and regulatory perspectives rather than the internal realities of any bank. A second limitation is that the field is developing rapidly, and some sources, particularly those from 2016 and earlier, may not fully reflect the current state of the technology or regulatory environment. A third limitation is that thematic analysis involves an element of interpretive judgement in identifying and organising themes, meaning the findings should be understood as one informed interpretation of the evidence rather than a definitive account.

5.3 Recommendations

For UK banks, the evidence suggests the most productive approach to blockchain adoption is a staged and targeted one. Rather than attempting to integrate blockchain across their entire payment infrastructure at once, banks should identify specific payment functions where blockchain's advantages are clearest, such as cross-border settlement and compliance reporting, and pilot solutions in those areas first. Banks should also invest proactively in cybersecurity measures that address vulnerabilities in the broader blockchain ecosystem and develop staff training programmes that build blockchain literacy across payment operations teams.

For regulators, including the Bank of England and the Financial Conduct Authority, the evidence points to the importance of providing clearer and more timely regulatory guidance on the use of blockchain in payment systems. The current regulatory uncertainty is itself a significant barrier to adoption and is likely to favour the less risk-averse fintech sector over traditional banks, which may not serve the broader interests of financial stability. The Bank of England's work on the digital pound is a positive step, but clearer guidance on blockchain-based payment systems more broadly would help UK banks make more informed decisions.

For future researchers, this study highlights a clear need for primary research examining the experiences and perspectives of those working within UK banks on blockchain adoption. Qualitative interviews with payment systems professionals, compliance officers and technology leaders within UK banks would provide institutional detail that secondary research cannot access. Future studies could also examine specific blockchain pilot projects within UK banks using case study methodology, and comparative research examining how banks in other leading financial centres such as Singapore or the United States are managing blockchain adoption could provide useful lessons for the UK context.

5.4 Concluding Remarks

This dissertation has examined the impact of blockchain and cryptocurrency on payment processes in traditional UK banking. The evidence shows that blockchain presents genuine and significant opportunities for the UK banking sector, particularly in improving the speed and cost of cross-border payments and in strengthening compliance and transparency. At the same time, these opportunities are accompanied by challenges relating to regulation, cybersecurity and systems integration that cannot be minimised. The balance between opportunity and challenge means that blockchain is unlikely to transform UK bank payment systems quickly or completely, but it is equally unlikely to remain on the periphery. The more probable outcome is a slow and structured integration of blockchain into specific parts of the UK payment system, driven by a combination of competitive pressure from fintech, regulatory development and the gradual modernisation of banking infrastructure. For UK banks, the central message of this study is straightforward: the question is no longer whether blockchain will affect payment processes, but how well-prepared banks are to manage that change.

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