BANKS SHAREHOLDER NET WORTH AND BLOCKCHAIN TECHNOLOGY

by

O'Neal Barnett

Dissertation

Submitted in Partial Fulfillment

of the Requirements for the Degree of

Ph.D. in Finance

Liberty University, School of Business

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Abstract

This study examined how blockchain technology affects the banking industry, specifically lending. It provided insights into how blockchain technology changes traditional banking operations and its potential to transform the industry. The research emphasized changes in banking and the effects of technological advances, particularly in digitalization. It outlined the research objectives to provide perspectives on how blockchain technology could lower costs and improve shareholders' equity in the banking sector. The study used a mixed-method design for the analysis. It outlined various strategies for banks to use blockchain technology, highlighting its potential benefits, such as improved transparency, faster settlements, increased trust, and reduced transaction expenses. This includes using relevant mechanisms such as stablecoins or digital currency, decentralized autonomous organizations (DAOs), tokenization, and smart contracts. Additionally, the study emphasized the limitations of blockchain technology within the banking sector, highlighting the need for further investigation into regulation, scalability, and interoperability. The research stressed the importance of understanding blockchain technology's limitations and potential impact on shareholder value. It also examined its potential role in improving operational efficiency, transparency, and security within the banking realm. Moreover, it emphasized the necessity of strategic planning and investment to address the complexities of integrating blockchain technology into banking operations.

Keywords: blockchain technology, distributed ledger, banking, finance, fintech (AI), decentralized finance, Federal Reserve, FedNow, FRED, credit creation theory, digital currency, cryptocurrency, smart contracts, stablecoins, decentralized autonomous organizations, tokenization of assets, ChatGPT.

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Dedication

I want to express my deep gratitude to my mother, Eliza Barnett. Mom, “I can do all things through Christ who strengthens me” (Philippians 4:13). I would also like to extend my thanks to my daughters, Bryanna Barnett, and Camilla Williamson, for their unwavering support and encouragement throughout the completion of this dissertation. Your steadfast belief in me has been a significant source of strength and invaluable support. Additionally, I want to express my heartfelt appreciation to all my family members, interview participants, friends, A Grace Gathering, and colleagues. Your consistent encouragement, inspiration, and motivation have been crucial in completing this dissertation. Finally, I dedicate this dissertation to my late father, whose memory inspires me daily. I am sincerely grateful for your invaluable support and contributions. Your encouragement, inspiration, and motivation have been indispensable in the accomplishment of this dissertation.

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First and foremost, I express my deepest gratitude to my advisor, Dr. Henry Kerich, for his unwavering support, guidance, and encouragement throughout my research journey. His expertise and insightful feedback have been invaluable in shaping this dissertation. I am also profoundly grateful to the members of my dissertation committee, Dr. Kendris Brumfield and Dr. Nicole Lowes, for their constructive criticism and suggestions, which have significantly improved the quality of my work.

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Chapter 1: Introduction to the Entire Study

This study presents a comprehensive overview of the escalating challenges confronting the banking sector due to blockchain technology. It meticulously defines these challenges as imperative issues that demand attention, given their profound impact on traditional banking practices, particularly in the lending segment. The researcher's objectives encompass outlining essential inquiries, establishing a research paradigm, elucidating fundamental concepts and their definitions, and delineating the study's assumptions, limitations, and scope. In examining the empirical truth about blockchain in the banking domain, the researcher underscored its significance by emphasizing its potential benefits to the academic community (Zuberi, 2017).

This study explored the potential application of blockchain technology as a financial tool for cost reduction and enhancing shareholders' equity in the banking sector. The research employed correlational methodologies to assess the prevalence of blockchain technology and conducted a comprehensive analysis using a mixed-method design to examine its implementation in commercial banking. During the quantitative phase, numerical measurements, analyses, computational techniques, and mathematical models investigated the relationship between dependent and independent variables within the selected sample (Huo et al., 2019). The qualitative phase involved the analysis of interview data using categorization methods (Huo et al., 2019). Both methodologies provided a thorough insight into the potential of blockchain technology to augment shareholder value in the banking industry.

Background of the Problem

Blockchain technology is reshaping the traditional banking sector by providing a secure and decentralized method of information transfer. It operates through a continuously expanding collection of encrypted blocks, each containing a cryptographic hash of the previous block. Upon

validation, these blocks are added to a chain maintained throughout the Internet, creating a unique and immutable record. The evolution of banking technology has continuously reflected technological advancements. From establishing the first official banks in 12th-century Italy to installing the first ATM in the 1960s, digital technology has significantly impacted banking operations. Today, the digital revolution continues with the widespread adoption of mobile banking, contactless payment cards, and digitized wallets, making money management more accessible and convenient globally. The modern digital consumer's preference for mobile and online platforms has transformed the payments industry. The demand for speed, convenience, 24/7 availability, and improved customer experience has fueled the growth of non-bank payment service providers and real-time gross settlement improvements.

This has prompted central banks to explore the potential of central bank digital currencies (CBDCs) and their impact on economies. A CBDC is a prospective new form of digital currency that shares features with current fiat currencies and could be issued by central banks as legal tender backed by government debt. Trials of CBDCs are being conducted worldwide, with countries such as the USA, China, Russia, Canada, Sweden, and Singapore actively exploring this financial technology. If a CBDC were released, it would be fiat-denominated in sterling, equivalent to the underlying fiat denomination, and implemented alongside cash and bank deposits. This development marks a significant shift in the financial technology landscape and has the potential to reshape the global economic system.

Problem Statement

This study investigated the overall disruptive impact of blockchain technology on traditional banking practices. The banking sector must acknowledge and adapt to this disruptive force. A decade ago, Satoshi Nakamoto, the enigmatic figure behind Bitcoin, demonstrated how

blockchain technology could address the challenges of transaction maintenance and prevent double spending in a decentralized setting (Zha et al., 2021). Subsequently, the ongoing advancement of blockchain technology has posed a substantial challenge to traditional banking practices due to its decentralized nature (Zuberi, 2017). Blockchain technology presents an increasingly formidable challenge to the banking industry (Harris & Wonglimpiyarat, 2019). The specific problem is the lack of operational and cost controls, which impacted shareholder value within the banking sector due to the absence of strategic implementation of blockchain technology in commercial banking practices.

Purpose Statement

The study examined the development of blockchain technology and its benefits in the context of its potentially transformative effect on the banking industry. The rapid expansion of blockchain technology, particularly with the rise of cryptocurrencies, has gained significant traction and utilization in the market (Calvão, 2019). Numerous organizations have recognized blockchain technology as a promising innovation, particularly within the financial industry. Consequently, blockchain technology is poised to play a pivotal role in shaping new financial systems, transcending its association solely with digital currencies. Smart contracts offer multifaceted advantages across various domains, including document validation and governing ownership rights of tangible and intangible assets. However, one of its most significant benefits is its role in mitigating fraudulent activities, a crucial aspect in the financial sector.

This study examined the progression of blockchain and its prospective impact on future banking trends. Furthermore, it endeavors to amalgamate insights concerning blockchain technology, facilitating a comprehensive understanding of its synergy with prevailing banking finance paradigms. Given that these paradigms served as the foundational operational elements

of this study, the integration of commercial lending and blockchain technology orchestrated processes and products geared toward cost containment. The entities delineated above have harnessed these paradigms as financial instruments to enhance bank management, both from a regulatory and operational standpoint. As such, they have played a crucial role in orchestrating blockchain technology's implementation and ongoing evolution. Results from this study underscored the potential of integrating blockchain technology to curtail independent variable expenditures, consequently fostering an upsurge in the dependent variable - shareholders' equity.

Research Questions

Ideally, there is a limited or scattered systematic review of blockchain technology, which is the focus of conducting this review. This paper reviews blockchain technology by answering the following questions:

- RQ1) How can blockchain technologies be used to minimize costs over time in commercial banking?
- RQ2) How do certain technical limitations of blockchain technology hinder its potential in a bank?
- RQ3) What is the suitability of blockchain technology across various commercial banking domains?
- RQ4) What is the relationship between blockchain technology implementation and banks’ shareholder net worth?
- RQ5) How much cost saving can a bank realize by implementing blockchain technology in their lending process?

The study objectives were considered when structuring the research questions, and this alignment will be achieved once the answers are produced. Commercial banks will always have

to deal with various technological innovation problems (Cucari et al., 2022). Although blockchain has been the subject of several academic articles, there still needs to be more. Blockchain can potentially alter how banks operate in the US and other countries (Arjun & Suprabha, 2020). Studies have shown that many areas in the banking industry can benefit from this kind of research, such as customer service, productivity improvement, and cost-cutting (Cocco et al., 2017). Additionally, studies have provided recommendations for what banks must do and how the regulator should react to this new technology. The researcher described some blockchain restrictions. Moreover, it is understood that blockchain technology influences every aspect of banks' business plans (who-what-how-why). As a result, new financial business models could emerge because of blockchain, upending the current quo (Ioannou & Demirel, 2022). Second, despite banks' best efforts, there was little progress in integrating blockchain into their business models. This demonstrates that blockchain technology is still in its infancy. This offered a fantastic chance for this study to advance academic understanding in this area of finance. The researcher is in a better position to understand the disruption blockchain technology is causing in the banking industry based on the answers to the questions above.

How can blockchain technologies be used to minimize cost over time in commercial banking? Research done by Osmani et al. (2021) indicated that distributed ledger technology could lower the cost of the financial sector's infrastructure by $8 billion to $20 billion, opening the door to the decommissioning of legacy equipment and systems and sharply lowering the cost of IT financing. The article also estimated it would work out to be a 30% reduction in infrastructure costs for banks annually (Osmani et al., 2021). Aggregating, editing, and exchanging data will no longer require as much physical labor from businesses, and it may be

simpler to produce regulatory reporting and audit documentation with less manual labor. Consequently, employees might only work on activities that create value.

Post-trade reconciliation and settlement are two blatant examples of time-consuming, expensive operations that financial firms may fundamentally reinvent by implementing blockchain technology (Hassani et al., 2018). Without a centralized database management system, financial institutions could share a standard digital representation of asset holdings and maintain track of the execution, clearing, and settlement of securities transactions outside their existing proprietary databases. In contrast to current protocols like SWIFT, distributed ledger technology may enable the direct settlement of transactions and provide better transaction tracking (Hassani et al., 2018). Banks could enable quicker payments at reduced costs by creating a decentralized payment ledger. Blockchain technology offers a quick and low-cost method of delivering payments that eliminates the need for third-party verification and outperforms the processing times for conventional bank transfers. Nowadays, transactions settle in an average of 25 minutes, though in rare circumstances, they may take hours or even days (Pal et al., 2021). ACH transactions settle in 3 days (Pal et al., 2021). Also, developers are working on scaling less expensive alternatives to expedite transaction processing. Traditional securities like stocks, bonds, and alternative assets could be tokenized and placed on open blockchains, improving the capital market's efficiency and interoperability (Jayasuriya & Sims, 2021). While it might make borrowing money more secure and offer cheaper interest rates, it could assist in reducing the need for gatekeepers in the loan and credit business (Jayasuriya & Sims, 2021). It could replace the time-consuming, paper-intensive bills of lading process in the trade finance sector since it fosters more global trading party security, trust, and transparency (Othman et al., 2022). By making information sharing between financial organizations faster and safer, storing

consumer information on decentralized blocks may be beneficial. Moreover, blockchain-based lending can reduce costs for all parties and offer a secure approach to giving loans to a diverse group of customers.

How do certain technical limitations of blockchain technology hinder its potential in a bank? Nodes are necessary for the correct operation of the blockchain network. The blockchain's quality depends on the nodes' quality (Zhao, 2022). For instance, blockchain for digital currency is reliable and encourages nodes to join the network. The same cannot be said for a blockchain network without rewarding nodes. Blockchain is undoubtedly a distributed network, but it lacks the characteristics that make distributed computing systems advantageous to businesses (Niranjanamurthy et al., 2019). As opposed to its equivalent centralized systems, blockchains are not as scalable. For instance, transactions are completed based on the network congestion level when using the blockchain network for digital currency since blockchain uses too much energy (Gaur, 2020). This issue is connected to blockchain network scalability problems. However, the likelihood of a network slowing down increases as more users or nodes join it (Zhao, 2022). Because there are fewer nodes in permissioned or private networks, these issues are not present. Also, they used practical consensus approaches to obtain consensus because there is no requirement for universal agreement (Hassani et al., 2018). As a result, digital-based transactions are challenging for authorities to monitor and regulate.

What is the suitability of blockchain technology across various commercial banking domains? With the recent shift in the U.S. government’s attitude towards blockchain and crypto assets, now is an opportune time for the U.S. financial industry to revisit this more mature, developed technology. Blockchain can improve existing products and services and offer new, more cost-effective solutions (Anwar et al., 2022). Both public and private blockchains can be

implemented across various use cases in the financial world, opening new sectors of banking services that benefit both banks and customers by enabling faster, cheaper, more secure, and more inclusive transactions (Hassija et al., 2021). New and competitive product and service introductions, asset and real estate tracking, physical asset registration (house, land, automobile), syndicated lending, liquidity management, cash reserve management, intra-bank settlements, and real-time loan funding automated servicing viSmart contract – a smart contracts are some of the potential applications (Anwar et al., 2022).

Optimization of the clearing and settlement regulatory processes, as well as real-time multiparty tracking and management of letters of credit, receivables financing, and decentralized contract execution, are other significant applications (Riad & Elhoseny, 2022). The top seven significant trends for blockchain and DLT, with a focus on the parts of the technology that matter most to banks worldwide, are as follows (Meng et al., 2021): Initial coin offerings (ICOs) and smart contracts as digital implementations of legal agreements, alternate strategies for obtaining startup capital, digital tokens with asset backing, non-fungible tokens (NFTs) with tradable cryptocurrency connected to other sources of value, digital currencies issued by central banks and backed by cryptocurrencies (CBDCs) (Cucculelli & Recanatini, 2022), proposals for new centralized coins with national backing, and various financial services based on blockchain, including banking and lending, credit prediction and scoring, loan syndication, underwriting, disbursement, asset collateralization, trade finance, letters of credit, and bills of lading.

What is the relationship between blockchain technology implementation and banks' shareholder net worth? Extant research devotes little attention to how and under what circumstances blockchain technology generates additional financial value for shareholders, despite blockchain's potential to alter organizations by offering new methods to organize

business operations and handle information (Ali et al., 2023). It can be helpful to keep information that the Chat Generative Pre-training Transformer (GPT) can use to advise on choosing the best combination of blockchain investment efforts for a particular business environment. According to experts, businesses looking to increase their market value should apply or develop blockchain in areas that increase time and cost savings (Zetzsche, 2018). For instance, automation of clearing and settlement, trade finance, and cross-border payment transactions is essential in the service industry to reduce processing time and costs. The daily exchange of goods and services and commercial processes, such as creating and reconciling invoices, processing insurance claims, and transferring property titles, can all be streamlined and automated using blockchain (Zetzsche, 2018). Small bank managers should know the benefits to market value of utilizing and furthering blockchain technology. Small bank executives are advised to take a bold step toward investigating such ideas. Top executives can more effectively prepare boundary condition announcements to significantly influence company market value by being aware of these boundary conditions and business-specific settings (Cucculelli & Recanatini, 2022).

How much cost saving can a bank realize by implementing blockchain technology in their lending process? By the end of 2030, banks will be able to save up to $27 billion on cross-border settlement transactions thanks to the deployment of blockchain technology, resulting in a more than 11% cost reduction (Wang et al., 2019). Ethereum has already proven disruptive economics with over 10x the cost benefits over established systems. Financial institutions agree that distributed ledger technology will save banks and other significant financial institutions billions of dollars over the next ten years. By creating previously unheard-of degrees of connectedness and programmability across goods, services, assets, and holdings, the digitization

of financial instruments—which includes digital assets, smart contracts, and programmable money—expands the advantages of blockchain technology (Osmani et al., 2021). These digitally enhanced tools will transform how the commercial and financial markets operate, bringing value to every interaction. Together, these advantages lead to more transparent and accountable governance systems, more effective business models, improved stakeholder incentive alignment, increased liquidity, lower capital costs, decreased counterparty risk, accessibility to a larger pool of investors and capital, and access to all other digital financial instruments (Garg et al., 2021).

Nature of the Study

This paper is based on the post-positivist worldview, an open-minded approach that expands and improves upon the positivist research paradigm. It is important to remember that this research paradigm, known as post-positivism, is not a rejection of whatever came before (Tarnoki & Puentes, 2019). Post-positivism, as the name suggests, does not outright reject its precursor; instead, it builds upon the foundational concepts of positivism. It was developed by Karl Popper, who aligned himself with several philosophers, including David Hume and Bertrand Russell, pointing out that just because something happens many times does not mean it will happen every time (Tarnoki & Puentes, 2019). Instead, Popper presented science as a deductive process in which a researcher deduces a proposition from their hypothesis and then attempts to prove that deduction wrong (Tarnoki & Puentes, 2019). If it is not proven wrong, even when everyone in the scientific community is given a chance to try hard, it can be accepted as provisionally true (Tarnoki & Puentes, 2019). The researcher is a data collection instrument and not a perfect knower of post-positivism is the idea of falsifiability. Karl Popper helped bring about a change in the philosophy of science by shifting from the idea of positive proofs, like a statement that all swans are white, to the null hypothesis, which is that one single black swan can

disprove the theory that all swans are white (Tarnoki & Puentes, 2019). So, what you find now in science is recognized as a recognition that we can never perfectly know if something is true. A theory can be general and have some predictive capability, but we are always seeking ways to falsify it, which is the archetype of the post-positive. Finally, this worldview acknowledges that there are limits to the researcher's ability to capture reality, which accurately ties into the post-positivist epistemology. Thus, this study will attempt to build an approximation of the research but never quite an absolute proof of the relationship between banking and blockchain technology.

Discussion of Research Paradigms

To understand a research paradigm, we must first understand the meaning and relationship of ontology and epistemology (Ponterotto, 2005). Ontology examines the nature of reality, while epistemology examines how a person can understand reality (Imafuku, 2019). Ontology is interested in addressing the question of what reality is. Ontology believes that there is only one single reality or truth. Secondly, ontology believes that there are multiple realities. Third, ontology believes that reality is constantly negotiated, debated, or interpreted. Epistemology refers to how an individual understands knowledge, their thinking process, and how they think others know. In other words, it addresses how people can know reality (Ponterotto, 2005). Several different epistemologies exist. Firstly, the belief that knowledge can be measured using reliable designs and tools. Secondly is the belief that reality must be interpreted to uncover underlying meaning. Thirdly, knowledge should be examined using tools best suited to solve the problem (Imafuku, 2019). When ontology and epistemology are combined, one can obtain a holistic view of how knowledge is understood. Combining the three

ontologies or epistemologies can form the most common research paradigms: positivism, constructivism, and pragmatism (Imafuku, 2019).

Positivist

Positivists have the ontology that there is one reality or truth and the epistemological stance that knowledge can be measured (Rechberg, 2018). Three crucial features of positivism are aimed at predicting behavior. When applied in social sciences, it can help predict human behavior. It is helpful for testing theories. Finally, it observes whether a phenomenon is happening. For example, a generalized standardized test might help us understand whether there are gaps in education outcomes within a particular population (Rechberg, 2018). It also looks for hard rules. So, they can understand reality if people get better scientific tools, and eventually, they can have a perfect understanding (Rechberg, 2018). The aim is to find universal truths and fundamental laws that apply in all circumstances. Positivist epistemology sees the knower as distinct from the object they are trying to know, so they measure and analyze things separately (Rechberg, 2018). Researchers should always look for ways to falsify the truth as they know it, so it is an ongoing process.

Post Positivism

Post-positivism emerged as a modification of positivism. The ontology of post-positivism, which pertains to the understanding of reality, posits that reality exists independently and can be known, albeit imperfectly (Turyahikayo, 2021). While it shares similarities with positivism, post-positivism acknowledges the limitations in accurately capturing reality. This is intertwined with post-positivist epistemology, where researchers can approximate the object of study but never fully capture its entirety (Turyahikayo, 2021). Researchers are seen as instruments of data collection, not infallible entities—a core principle of something. Part of the

underlying rationality of post-positivism is falsifiability (Turyahikayo, 2021). Karl Popper revolutionized the philosophy of science from the idea that we could create positive proofs to the null hypothesis, exemplified by the notion that a single Black Swan can disprove the theory that all Swans are white (Turyahikayo, 2021). Thus, science is a process in which they can never fully ascertain truth but can develop theories with predictive capabilities, always looking for ways to falsify them.

Constructivism

In contrast, constructivists believe in the existence of multiple realities. Their epistemological stance is that knowledge must be interpreted to discover the underlying meanings. Constructivists argue that the physical world gains meaning through mutual understanding built between individuals (Rechberg, 2018). Constructivism aids in theory building, viewing researchers as inherently involved in constructing knowledge alongside participants (Rechberg, 2018). Therefore, research participants are seen as co-researchers rather than mere subjects.

Pragmatism

Pragmatists hold that reality is constantly negotiated, debated, and interpreted. Their epistemological stance is that knowledge should be examined using the best tools to solve specific problems (Rechberg, 2018). Pragmatism, rooted in the Greek word "pragma," meaning action, frames reality through action (Rechberg, 2018). Experiencing reality involves warranted assertions justified through research and experimentation (Corry et al., 2019). Pragmatism values action over theoretical or philosophical constructs. It posits that an ideology or proposition is true if it works satisfactorily and that the meaning of a proposition is found in its practical

consequences (Corry et al., 2019). This active inquiry process allows researchers to determine the most suitable approach and methodology for their research topic.

Researcher's Paradigm

This study is grounded in the post-positivist worldview, which extends and adapts the fundamental ideas of positivism rather than completely rejecting them. Philosophers like Karl Popper, David Hume, and Bertrand Russell emphasized that repetitive occurrences do not guarantee universality. In this context, science is viewed as a deductive process where researchers formulate propositions based on hypotheses and attempt to disprove them. If a deduction withstands scrutiny, it is provisionally accepted as accurate. The post-positivist approach emphasizes falsifiability, acknowledging the inherent limitations that prevent researchers from fully comprehending reality. This aligns with the epistemological perspective of post-positivism. The primary goal of this study is to establish an approximate understanding of the relationship between banking and blockchain technology, recognizing that absolute certainty may be unattainable.

Discussion of Research Design

Fixed Method

Fixed method research design is a deductive approach that needs more flexibility to incorporate the researcher's experiences. The study's framework is established in fixed designs before data collection begins. Since predicting which variables must be controlled and measured in advance is impossible, fixed designs are typically theory-driven (Mohajan, 2020). These factors are often quantified and measured, with the information usually being numerical and the analysis layout pre-determined. Fixed designs include longitudinal designs for trend analysis and quantitative cross-sectional designs for generating statistics from populations and conducting

experiments (Mohajan, 2020). Data and statistics are used to create graphics-based models, which help identify inferences from observational data. This method highlights the number and evaluation of variables, examining their correlation and relationships (Mohajan, 2020). Therefore, using standard sample sizes in social and behavioral sciences, amounts can be calculated.

Flexible Method

The flexible method, or content analysis, allows for iterative and emergent research design adjustments based on new findings. This approach involves an exploratory process using various analytical techniques to generate and situate findings. It encompasses qualitative and quantitative methods, sometimes combining both (White & Marsh, 2006). Content analysis rigorously examines documents collected or generated during research, differentiating between quantitative and qualitative approaches. In flexible research methodology, data is usually non-numeric, and there are no constraints during data collection. This method assesses potential failure modes from uncertainty and examines conceivable design adjustments (White & Marsh, 2006). Widely utilized in library and information science (LIS) studies and prevalent in social and life sciences, this approach requires minimal and adaptable planning, allowing researchers to adjust as needed (Boeije & Afd Methoden en Statistieken, 2002).

Furthermore, as a flexible research approach, it meticulously evaluates potential design modifications while considering the implications of uncertainty-induced defect modes (White & Marsh, 2006). Given its applicability to diverse research goals and the capacity for researchers to adjust, this method is well-suited for library and information science (LIS) studies and prevalent in social and life sciences (White & Marsh, 2006).

Mixed Method

The mixed method approach integrates qualitative and quantitative methodologies to address fundamental research inquiries. This approach is suited for research topics that cannot be adequately addressed by purely qualitative or quantitative methods alone (Shorten & Smith, 2017). A mixed methods approach involves collecting and analyzing quantitative and qualitative data within a single study. It necessitates intentionally combining methods in data collection, analysis, and interpretation of findings (Shorten & Smith, 2017). This integration allows researchers to comprehensively understand their research domain by examining phenomena from varied perspectives. By applying both qualitative and quantitative approaches, the mixed-methods process facilitates a more profound comprehension and yields comprehensive data analysis (Shorten & Smith, 2017). This method is commonly employed in multidisciplinary and complex behavioral, health, and social sciences fields.

Discussion of Method

A mixed-method approach was chosen for this research because it utilizes both qualitative and quantitative methods. This approach facilitated a more comprehensive understanding of the study, particularly in analyzing blockchain technology within the banking sector (Yin, 1994). Both methods collectively allowed for in-depth data analysis, which is essential given the multifaceted applications of blockchain technology in the banking industry. The study employed a convergent parallel design, a methodology commonly associated with mixed methods research. This approach involved the simultaneous collection of qualitative and quantitative data, followed by independent analyses and subsequent comparison and integration of findings.

While the qualitative phase serves exploratory purposes and directs the study, the subsequent quantitative phase enables hypothesis testing (Yin, 2018). A qualitative research design emphasizes the quality and manner of information analysis, while a quantitative design focuses on variables or relationships (Jackie & Recio, 2020). The mixed-method approach enables addressing various factors and questions (Jackie & Recio, 2020), which is advantageous considering the limited existing data in this emerging field of study. Within the qualitative research phase, textual statistics will be gathered through interviewer case studies and analyzed using a unit of analysis and categorization methods (Han et al., 2019). Data will be organized and verified in the quantitative phase through a series of tests. This study used a structural equation model or structural invariance test to evaluate hypothesized relationships and differences between blockchain efficiency and shareholders' net worth, drawing on theoretical findings and data from various research papers, literature, and reports from regulatory bodies and financial institutions.

The limitations of fixed and flexible research methods are also considered. The flexible method, while offering adaptability, may introduce bias and privacy concerns (Han et al., 2019). In contrast, the fixed method has the potential to be limited due to predetermined survey answers, which may restrict the exploration of participants' behaviors and attitudes (Tarnoki & Puentes, 2019). Additionally, conducting research in a controlled setting may not reflect real-world scenarios and raises validity concerns for inconclusive results (Jackie & Recio, 2020). It is acknowledged that due to federal regulations, accessing sensitive data from banking professionals for qualitative research and the potential for biased opinions are significant concerns. Considering these nuances, applying a mixed-method research approach was essential

to address the complexity of the study and overcome the limitations inherent in single-method approaches.

Discussion of Triangulation

Studying and analyzing blockchain technology using a triangulation approach provided a better understanding of the impact on shareholder net worth in banking and opened new doors to understanding this finance area. Triangulation was used to check and establish validity in the studies by analyzing a research question from multiple perspectives (Oppermann, 2000). This approach enabled the researcher to employ cross-validation using diverse data sources, ensuring a more robust confirmation of the study's outcomes. Therefore, the researcher gained a more in-depth understanding of the implementation of blockchain technology in the banking industry, which facilitated a more extensive comprehension of its impact on shareholders' overall wealth.

In the quantitative phase, items were arranged and certified by running a series of tests. For this area, the researcher used a structural equation model or structural invariance test to evaluate the hypothesized relationships and differences between blockchain efficiency and shareholders' net worth. Experimentation research included the independent variable of expenditures or cost and the dependent variable of equity or net worth. The researcher better understood the cost of integrating blockchain technology into the banking system and the impact on shareholders’ net worth. Experimentation research involves experimenting to prove a hypothesis. The dependent variable is the object or idea to be tested, and the variables are changed and manipulated to see how they affect the dependent variable (Oppermann, 2000). For this area, the researcher proposed a structural equation model or structural invariance test to evaluate the hypothesized relationships and differences between blockchain efficiency and

shareholders' net worth. The source of this data came from specific theoretical findings and the Federal Reserve.

In the qualitative research phase, the textual statistics were compiled via interviews and analyzed using a unit of analysis and categorization method (Han et al., 2019). The need for conducting interviews stemmed from the necessity to comprehensively grasp the intricate relationship between banking shareholders' net worth and blockchain technology (Han et al., 2019). It allowed the researcher to retain a holistic and real-world perspective.

Summary

This section discussed different research paradigms, including positivism, post-positivism, constructivism, and pragmatism, formed by combining different ontological and epistemological beliefs. Positivism focuses on predicting behavior and finding universal truths, while post-positivism recognizes limits in capturing reality and emphasizes falsifiability. Constructivism holds that reality is constructed through mutual understanding, while pragmatism views reality as constantly negotiated and knowledge as problem-solving tools. Each paradigm offers a distinct perspective on how knowledge is understood and acquired.

The research utilized a mixed-method approach involving qualitative and quantitative methods to analyze blockchain technology in the banking sector comprehensively. The qualitative phase directed the study, while the quantitative phase enabled hypothesis testing. The mixed-method approach addressed various research factors and questions crucial in an emerging field with limited data. Textual statistics were gathered in the qualitative phase, and data was organized and verified in the quantitative phase. The study also considered the limitations of fixed and flexible research methods, emphasizing the importance of using a mixed-method approach to address the complexity of the study and overcome inherent limitations in single-

method approaches. Finally, this section reviewed the triangulation mixed-method research approach, incorporating quantitative and qualitative data. The quantitative phase involved running tests and proposing a structural equation model to evaluate the relationships between blockchain technology and shareholders' net worth. The qualitative phase involved textual data compiled via interviews and analyzed using a unit of analysis and categorization method.

Conceptual Framework

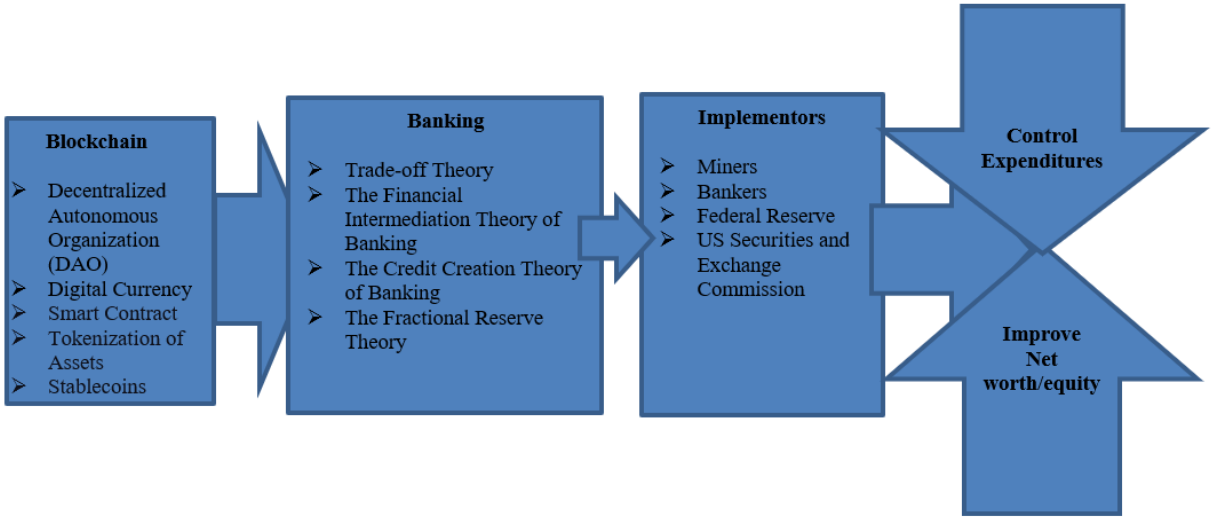
Introductory Paragraph

The methodology employed in this study delves into the potential applications of blockchain technology as a financial instrument to reduce expenses and enhance shareholders' equity in the banking sector. The study utilizes straightforward correlational approaches to ascertain the prevalence of blockchain technology. It conducts quantitative and qualitative analyses of its incorporation in commercial banking through a mixed design method. The quantitative aspect involves using numerical measurements, analysis, computational techniques, and mathematical models. At the same time, the qualitative phase seeks to comprehend this field of study by compiling textual statistics from surveys or case studies using a unit of analysis and categorization methods (Han et al., 2019). The analysis outcomes contribute to understanding the relationship between dependent and independent variables within the selected sample (Han et al., 2019). Comprehensive information on the subject was garnered from pertinent secondary sources such as Federal Reserve databases. This information facilitated the investigation of the core research queries, including the potential of blockchain technologies to reduce long-term costs in commercial banking, the technical limitations that hinder its viability in financial institutions, the applicability of blockchain technology across various banking domains, the relationship between its implementation and banks' shareholder equity, and the potential cost savings achievable by

banks through the implementation of blockchain technology in their lending processes. The insights obtained shed light on strategies to enhance shareholder value in banking, encompassing the prevalence of blockchain technology adoption in banks and the severity of the issue (Han et al., 2019)

Figure 1

Conceptual Framework



Concepts

Blockchain – blockchain – An expanding directory of accounts or records called blocks, which are secured because they are linked together by a cryptographic hash, a timestamp, and transaction data (Aste et al., 2017). The distributed data store of digital transactions. Blockchain is a new technology and is the ledger system behind cryptocurrency (Aste et al., 2017). This is a decentralized ledger, unlike a banking ledger. Blockchain can also be private.

Decentralized Autonomous Organization (DAO) – A blockchain organization that is automated and decentralized. Blockchain-based organizations called decentralized autonomous organizations (DAOs) are fueled by a peer-to-peer (P2P) network of contributors (Santana &

Albareda, 2022). Their governance functions autonomously based on a combination of on-chain and off-chain technologies that allow community decision-making. Their management is decentralized without top executive teams and founded on automated rules encoded in smart contracts (Santana & Albareda, 2022). Without a management system, it is a particular kind of venture capital fund. Because they use the decentralized system, they are not managed by a single entity or group but rather by several networks, computers, or nodes.

Digital Currency – A form of exchange produced, saved, and transmitted electronically (Wadsworth, 2018). It is not generally related to any nation's Authority or characterized in tangible forms like the notes or coins of conventional currencies. Therefore, it is a currency that is only available in electronic or digital format (Wadsworth, 2018). They are typically based on a decentralized system. Blockchain typically generates them. It is the opposite of fiat money (Wadsworth, 2018).

A Smart Contract – is a decentralized application that performs business logic in response to events (Cong & He, 2019). In other words, digital contracts are self-executing based on the terms between two parties. These agreements are generated digitally using tokens powered by blockchain (Cong & He, 2019). Transactions are trackable and irreversible. They are held on a blockchain system. So, they are merely programs kept on a blockchain that run when preset terms are met. They are contracts between two individuals or entities in the form of computer code programmed to be implemented mechanically (Cong & He, 2019). *They* permit designers to create apps that utilize blockchain security, reliability, and accessibility (Cong & He, 2019).

Theories

The trade-off theory of capital structure posits that a company determines its debt and equity financing mix by balancing the associated costs and benefits (Werner, 2016). A key objective of this theory is to explain why corporations typically use a combination of debt with debt and equity financing (Werner, 2016).

According to the trade-off theory of capital structure, the amount of debt a firm should take on to lower its tax liability should be balanced against the deadweight costs of bankruptcy (Rahman, 2019). The theory suggests that the cost of debt is generally lower than that of equity because interest on debt is tax-deductible. However, while debt may be cheaper, insolvency is risky if the firm cannot meet its debt obligations (Rahman, 2019). Finally, the risk-return trade-off theory of capital structure asserts that a corporation must maintain a certain level of current assets and/or working capital to achieve optimal profitability.

The Financial Intermediation Theory of Banking posits that banks act as financial intermediaries by collecting and lending deposits. Banks create liquidity by borrowing short-term and long-term lending, meaning they borrow from depositors with short maturities and borrowers with longer maturities (Werner, 2016). According to this theory, banks can function individually and collectively as financial intermediaries, behaving similarly to other non-bank financial institutions, particularly in the deposit and lending sectors, as they cannot generate new money individually or collectively. In conclusion, financial intermediaries play a crucial role in credit markets by reducing the cost of transferring funds from relatively uninformed depositors to uses that require significant knowledge and are challenging to assess, leading to a more efficient allocation of resources (Montes et al., 2021). Intermediaries specialize in information

gathering, project evaluation, borrower performance monitoring, and risk sharing (Montes et al., 2021).

The Credit Creation Theory of Banking asserts that banks create credit and money out of thin air each time they issue a loan or acquire assets. Banks are not required to gather deposits or reserves to lend. Since bank lending is said to create new credit and deposit money, an increase in total balances occurs without a corresponding decrease elsewhere (Werner, 2016). Therefore, according to this theory, time, bank balance sheets, and money supply measures tend to show a rising trend during periods of growing outstanding bank credit (Werner, 2016).

The fractional reserve theory states that only the banking system can create money, while each bank acts merely as a financial intermediary, gathering deposits and lending them out (Werner, 2016). Under fractional reserve banking, banks must retain only a portion of customer deposits as reserves and can lend the remainder to other clients. This system allows continuous borrowing and spending, stimulating the economy by utilizing money that would remain idle in bank accounts (Haymond & Beach, 2020). According to this theory, every bank is a financial intermediary. When banks lend money to borrowers, new money is created (Haymond & Beach, 2020).

Actors

Miners are individuals or companies that gain access to digital currency by constructing new blocks for blockchain networks (Zhang et al., 2019). Their responsibility is to confirm transactions, which require solving complex mathematical problems and consume significant energy. Each transaction adds new blocks to the blockchain network, and the mining results serve as the basis for validation. Miners use blockchain mining to verify the authenticity of transactions, which are then recorded in the blockchain. The network's security is enhanced as

more miners participate, ensuring no fraudulent activity occurs (Zhang et al., 2019). The mining process can be categorized into three types: individual mining, where a single person mines; pool mining, where a group of users collaborates to authorize transactions; and cloud mining, where mining is done without using personal computer hardware and software.

Commercial Bankers are managers of financial services responsible for producing and delivering commercial services (Herpfer, 2021). Their clients typically include wealthy individuals, investors, companies, and other organizations. Specializations within commercial banking may include loan officers, mortgage bankers, credit analysts, and trust officers. Loan officers work with both business and individual borrowers to manage loan agreements. Mortgage bankers handle more complex lending processes and have direct client interactions. Credit analysts assess the creditworthiness of prospective borrowers based on the five C's of credit (Herpfer, 2021). Trust officers develop specialized financial strategies for clients in investments, taxation, and estate planning. The duties of a commercial banker can vary depending on their area of expertise, the size of their institution, and their years of experience. Fundamental responsibilities include providing credit products such as revolving lines of credit, cash management services, syndicated facilities, and term loans. They offer financial services to businesses, including working capital, equipment financing, and commercial real estate lending. Additionally, they provide treasury management services such as fund collection and fraud protection and deposit products like checking and savings accounts.

Shareholders – Shareholders are the owners of a company, typically represented as equity or net worth on the balance sheet. A shareholder is an individual or entity that owns at least one share of a company's stock. Shareholders benefit from a company's success and bear the impact of its losses, giving them a vested interest in its performance (Degl'Innocenti et al., 2023). A

shareholder must own at least one share of the company's stock or mutual fund to be considered a partial owner. If the company performs well, dividends are often paid to shareholders. They can vote on specific business matters and run for a position on the board of directors (Degl'Innocenti et al., 2023). There are two categories of shareholders: common shareholders, who own common stock and have voting rights, and preferred shareholders, who own preferred stock and receive a fixed annual dividend before common shareholders but do not have voting rights (Degl'Innocenti et al., 2016).

Federal Reserve is the United States central bank that monitors financial system risks to maintain health. The Federal Reserve System, commonly referred to as the Federal Reserve or simply the Fed, is the nation's central banking system (Benigno et al., 2022). Established with the passage of the Federal Reserve Act on December 23, 1913, it was created in response to the need for centralized control of the monetary system to prevent financial crises, such as the Panic of 1907 (Benigno et al., 2022). The Federal Reserve System's functions and responsibilities have expanded over time due to events like the Great Depression in the 1930s and the Great Recession in the 2000s (Ainsley, 2022). The Federal Reserve Act outlines three primary goals for monetary policy: increasing employment, maintaining price stability, and lowering long-term interest rates (Ainsley, 2022). Twelve regional Federal Reserve Banks in various cities across the country manage and supervise independently held commercial banks. The Federal Open Market Committee (FOMC), which includes the twelve regional Federal Reserve Bank presidents and all seven members of the Board of Governors, decides on monetary policy (Benigno et al., 2022).

The US Securities and Exchange Commission - Following the Wall Street Crash of 1929, the U.S. Securities and Exchange Commission (SEC) was established as an independent federal body in the United States (McCammon et al., 2022). The SEC's primary goal is to enforce laws

against market manipulation. The SEC regulates securities dealers and brokers, securities exchanges, and mutual funds to promote ethical business practices, the use of investment advisors, the publication of important market information, and the fight against fraud (McCammon et al., 2022). The SEC safeguards investors, upholds fair, efficient, and effective markets, and promotes capital formation.

Constructs & Variables

Blockchain technology – This is a database concept outlined above. It is primarily in the conceptual phase of its development. This study verified its impact on the banking industry. A blockchain is a distributed ledger. Using cryptographic hashes, a blockchain is a growing list of documents (blocks) that are securely connected. Each block includes transaction information, a timestamp, and a cryptographic hash of the preceding block (generally represented as a Merkle tree, where leaves represent data nodes) (Aste et al., 2017). The timestamp demonstrates that the transaction data existed when the block was produced. Each block links to the previous blocks, forming an effective chain (like a linked list data structure), because each block carries information about the preceding blocks. Thus, once a transaction has been recorded, it cannot be undone without undoing all subsequent blocks, making blockchain transactions irreversible (Aste et al., 2017).

Commercial lending – This banking area involves the bank's relationships with corporate borrowers to provide financing at predetermined interest rates. Managers of financial services oversee this area, which is responsible for producing and delivering commercial services (Herpfer, 2021). The customers are typically wealthy individuals, investors, companies, and others. A commercial department's fundamental responsibilities include providing credit products such as revolving lines of credit, cash management services, syndicated facilities, and

term loans. This bank area offers businesses financial services, including working capital, equipment financing, and commercial real estate lending. It also provides treasury management services such as fund collection and fraud protection. Additionally, they offer deposit products, including checking and savings accounts.

Variables

Net worth/equity is the dependent variable, meaning its value depends on changes in expenditures. It is the value of the company's assets minus all liabilities. Net worth is another term for book value or shareholders' equity in the business world (Wang, 2022). Simply put, net worth is the difference between assets and liabilities. It indicates the value that would remain after a corporation sold all its assets and settled all its debts. Share issuances, revaluation reserves, retained earnings, net profit or loss for the fiscal year, and special tax-based reserves are added to determine it (Wang, 2022). It indicates how much the owners have left after covering all their liabilities. The change in value helped me understand if implementing blockchain technology has a positive or negative effect on the company.

Expenditures/Expenses – Independent variables helped the researcher explain net worth/equity. Expenditures involve consuming funds and tracking the amount spent on a particular category. An expenditure is a payment made in cash or on a credit card to buy goods or services. Unlike an expense, which is documented in a period after it has been used up or expired, it is recorded at a single point in time (the time of purchase) (How to analyze and cut business expenses, 2021 accurately). An expense is a business's operational cost incurred to produce income. The full cost to purchase a commodity or service is known as expenditures. The amount shown as an offset to revenues or income on a company's financial statement is known as expenses. The distinction between expenditure and expense exists (Pitta et al., 2019). Capital and revenue expenditures are

the two main categories of expenses in accounting (Pitta et al., 2019). When an organization purchases an asset with a more than a year of useful life, it makes a capital expenditure (CapEx) (a non-current asset). When an organization spends money on a temporary benefit, it engages in revenue expenditure (i.e., less than one year) (How to accurately analyze and cut business expenses, 2021). These expenses are typically used to pay for ongoing activities, also known as operating expenses, when expensed. Income is not impacted by spending unless it is documented as such. Additionally, although revenue expenditure is tied to short-term operational costs, CapEx is related to long-term expenditures and represents a significant commitment. They cannot be carried over to the following fiscal year because they are both documented in the same one in which they are incurred. It is measurable and was tested based on quantitative statistical data from various banking institutions.

Relationship Between Concepts, Theories, Actors, Constructs, and Variables

Blockchain technology is an expanding directory of accounts or databases created by a cryptographic hash with a timestamp. It is a decentralized ledger, unlike a banking ledger. Historically, it has been used in a publicized environment, but banks can privatize the technology by using its by-products to improve cost control, enhancing shareholders' net worth. The bank can be established as a semi-decentralized Autonomous Organization (DAO), which is a blockchain organization that is automated and decentralized. It does not have a management system. They are not controlled by a single person or organization but by various networks, computers, or nodes, taking advantage of the decentralized system. The DAO can utilize digital currency, collateralized by fiat money, a form of exchange produced, saved, and transmitted electronically (Wadsworth, 2018). Finally, banks can then use a smart contract, which is a decentralized application that performs business logic in reaction to events related to commercial

lending procedures (Cong & He, 2019). In other words, digital contracts are self-executing based on the terms between two parties.

The implementation of blockchain will impact the capital structure of a bank. To control costs, they will better manage debt and equity finance (Lainà, 2019). They will become more cost-efficient as financial intermediaries collect and lend deposits. Faure and Gersbach (2022) state blockchain will help maintain liquidity by producing credit more efficiently. Because of the autonomous nature of the banks, miners would be people or organizations that receive digital currency to add blocks to a blockchain network. Their job is to verify transactions. These miners will be the bankers responsible for producing and delivering commercial services to the bank's customers. The cost savings from implementing blockchain technology will add shareholder value. However, banks will be regulated differently by the Federal Reserve because the Federal Reserve's primary purpose is to keep the financial system healthy. If the banks are publicly traded, they will also be regulated by the SEC.

Summary of the Conceptual Framework

This researcher combined data about blockchain by-products to understand how they can work with the banking financing theories mentioned above. Since the theories are the core operating components of the constructs of this study, commercial lending and blockchain by-products will work together to form processes and products to minimize expenditures. The actors outlined above used those theories as financial tools to manage the bank more efficiently from a regulatory and operational perspective. So, the actors played a role in implementing blockchain and its ongoing development. This study shows that implementing those blockchain by-products will help decrease the independent variable, expenditures, leading to an increase in the dependent variable, shareholders' net worth.

Definition of Terms

The bank's shareholder net worth and blockchain technology research paper used the following terms, with literature definitions from various sources.

Blockchain is an expanding directory of accounts or records called blocks, which are secured because they are linked together. They are linked together by a cryptographic hash, a timestamp, and transaction data (Gorkhali & Shrestha, 2020). Blockchain is a new technology and is the distributed data store of digital transactions. It is the ledger system behind cryptocurrency (Firdaus et al., 2019). This is a decentralized ledger, unlike a banking ledger. Blockchain can also be private.

Decentralized Autonomous Organization (DAO) – is a blockchain organization that is automated and decentralized. It is a type of venture capital fund. It does not have a management system (Sims, 2019). They are not controlled by a single person or organization but by various networks, computers, or nodes, because they take advantage of the decentralized system (Rikken et al., 2019).

Digital Currency – Digital currency is a form of exchange that is produced, saved, and transmitted electronically (Wadsworth, 2018). It is not generally related to any nation's currency authority or characterized in tangible forms as the notes or coins of conventional currencies. Therefore, it is a currency only available in electronic or digital format (Agur et al., 2022). They are typically based on a decentralized system. Blockchain typically generates them. It is the opposite of fiat money (Lee et al., 2021).

A decentralized application that performs business logic in reaction to events (Cong & He, 2019). In other words, digital contracts are self-executing based on the terms between two

parties. These agreements are generated digitally using tokens powered by blockchain (Meier & Sannajust, 2020). Transactions are trackable and irreversible. They are held on a blockchain system. So, they are merely programs kept on a blockchain that run when preset terms are met. They are contracts between two individuals or entities in the form of computer code programmed to be implemented mechanically (Xiong & Hu, 2022). They permit designers to create apps that utilize blockchain security, reliability, and accessibility (Cong & He, 2019).

The trade-off theory of capital structure states that a company chooses how much debt and equity finance to use by balancing the costs and benefits (Abel, 2018). The theory's essential purpose is to explain that corporations are usually financed partly with debt and partly with equity (Werner, 2016).

The financial intermediation theory of banking establishes that banks are purely financial intermediaries that collect and lend deposits. Banks create liquidity by borrowing short and lending long," meaning that banks borrow from depositors with short maturities and lend to borrowers at longer maturities (BoAa & Zimkova, 2020).

The credit creation theory of banking posits that banks produce credit and money out of thin air each time they execute a loan or acquire assets. Banks are not required to gather deposits or reserves to lend. Since bank lending is said to create new credit and deposit money, an increase in total balances occurs without a commensurate decrease elsewhere (Werner, 2016). Therefore, according to this theory, over time, bank balance sheets and money supply measures tend to show a rising trend in periods when outstanding bank credit grows (Lainà, 2019). The fractional reserve theory states that only the banking system can collectively create money, while each bank is a mere financial intermediary, gathering deposits and lending these out (Faure & Gersbach, 2022).

Miners are people or organizations that receive digital currency to add blocks to a blockchain network (Toda et al., 2021). Their job is to verify transactions, which requires much energy because they must solve mathematical equations.

Commercial Bankers – Managers of financial services. They are responsible for producing and delivering commercial services (Foerch, 2020). Their customers are typically wealthy individuals, investors, companies, and other organizations.

Shareholders are a company's owners, typically represented as equity or NW on balance. A shareholder is a person or company that owns at least one share in a company's stock. Shareholders

usually benefit from the increase in a company's success or realize the negative impact of a company's losses (Álvarez-Botas et al., 2022). Therefore, they have an interest in the performance of a company.

Federal Reserve—The United States central bank monitors risks related to the financial system (Sokol, 2022) to keep it healthy. This organization was a source of data for the subject study.

US Securities and Exchange Commission – regulates securities dealers and brokers, securities exchanges, and mutual funds to encourage honest commerce, investment advisors, the disclosure of critical market data, and to counteract fraud (Adler et al., 2021). This organization was a source of data for the subject study.

Commercial lending is the area of banking where the bank engages in a relationship with a corporate borrower to provide financing at a predetermined interest rate (Foerch, 2020). The study focused on this area of the bank.

Net worth/equity = Dependent variable – Its value depends on the changes in expenditures—the value of the company’s assets minus all liabilities (Álvarez-Botas et al., 2022). The change in

value helped the researcher understand if implementing blockchain technology has a positive or negative effect on the company.

Expenditures are independent variables that helped the researcher explain net worth/equity. They involve consuming funds and tracking the number of funds spent on a particular category (Flyvbjerg et al., 2018). Expenditures are measurable and were tested based on quantitative statistical data.

ChatGPT is an artificial intelligence chatbot created by OpenAI and released in November 2022 (Chao et al., 2021). ChatGPT employs natural language processing to simulate human communication (Zhu et al., 2023). ChatGPT uses a sizable language model trained on vast web data to generate its responses. ChatGPT, or Chat Generative Pre-training Transformer, enables users to converse with it in conversational or informal language (Chao et al., 2021). It has been improved using supervised and reinforcement learning methods and is based on the OpenAI GPT-3.5 and GPT-4 families of large language models. (Chao et al., 2021).

Assumptions, Limitations, Delimitations

Assumptions

In the world of finance, there are numerous assumptions surrounding blockchain technology. Often hailed as a revolutionary invention heralding a new economic era, blockchain technology has captured the interest of many. With a genuine enthusiasm for technology, the prophesied advancements in blockchain technology are achievable.

Regarding blockchain technology, many presumptions are being made in the banking sector. It is common to hear people describe blockchain technology as a game-changing invention and the beginning of a new economic era. The blockchain financial system could be created due to blockchain technology (Beck et al., 2018). Blockchain finance is expected to

assist in lowering the expenses associated with banking activity coordination. In the blockchain financial system, predetermined transactions would be carried out automatically while adhering to predetermined rules. Decentralized autonomous organizations (DAOs), companies with governance rules outlined in the blockchain, are a new organizational design that would emerge from the blockchain financial system. The decision rights, accountability, and incentives part of the IT governance literature will be used to define the blockchain financial system. The DAO will serve as an example of how governance in the blockchain economy may drastically diverge from traditional concepts of government (Beck et al., 2018).

Thus, predictions regarding blockchain futures emerge when there is a genuine interest in the technology, which might be considered at the bottom of the "Gartner Consultancy's hype cycle" (Kewell & Ward, 2017). To ensure that the Internet of Things (IoT), "5G" mobile communications technology, and artificial intelligence (AI) capabilities work together inside a redesigned IT stack, blockchain solutions could thus be prominently featured on corporate purchasing lists of the future. The abundance of "4G" technologies, platforms, and "apps" has made it extraordinarily difficult to decide which systems and solutions to purchase and which expectations to believe (Kewell & Ward, 2017). The introduction of AI, 5G, and IoT might make these issues much more complicated, leading to a dizzying number of options that the financial sector and banks will have to negotiate as they evaluate the risks associated with the strategic acquisition of fundamental enterprise technologies.

Limitations

The study explored the impact of blockchain technology on the net worth of banks and its implications for shareholders. The research methodology involved a qualitative analysis of textual data collected from interviews, employing a unit of analysis and categorization approach

(Han et al., 2019). The findings elucidated bankers' experiences, self-management, beliefs, and behaviors. The study faced limitations in data collection due to the relatively new concept of blockchain in the banking sector, resulting in a small sample size. Additionally, quantitative data was sourced from secondary sources, particularly The Federal Reserve, and was constrained by privacy regulations. The challenge of obtaining updated quantitative data was also noted (Han et al., 2019).

The study highlighted theoretical and practical implications for shareholders, encompassing technology, law, and management. It emphasized the need for scholarly attention to innovations affecting the banking sector, considering their potential disruptive effects on the global economy. Therefore, the research aimed to investigate how blockchain technologies influence the banking sector comprehensively. Notably, the study diverged from initial publications focused solely on bitcoins and introduced a broader interdisciplinary framework for future growth.

Delimitations

Some believe blockchain technology has outgrown its primary association with the Bitcoin payments industry (Arjun & Suprabha, 2020). This idea has inspired various projections of blockchain futures without a significant presence in the Bitcoin ecosystem. However, it is still conceivable to envision a blockchain future in which Bitcoin predominates. Future expectations can be compelling in highlighting these subtexts in the context of current technology adoption and selection processes, acting as an invisible hand in creating business models and influencing managerial strategy and purchasing decisions (Arjun & Suprabha, 2020).

Significance of the Study

The findings of this study hold several significant implications, particularly for the academic community, in understanding the empirical truths related to blockchain in the banking industry. Academics can utilize the insights from this study to acknowledge the value of blockchain knowledge in advancing academic pursuits, potentially enhancing digital literacy and financial acumen. Subsequently, researchers can proactively address financial challenges associated with blockchain expertise. The knowledge acquired has the potential to influence operational efficiency in banks and contribute to the increase of shareholder value. Through the utilization of new data, the role of blockchain expertise in enhancing banking proficiency can be more comprehensively understood.

Moreover, this information can assist managers in educating their staff, thereby contributing to the overall improvement of financial infrastructure globally and facilitating more effective and sustainable growth (Cocco et al., 2017). Additionally, this study is pertinent to institutions focusing on blockchain technology to promote economic growth. Lastly, future researchers can benefit from the insights of this study as it can serve as a valuable reference for expanding their knowledge (Cocco et al., 2017).

Reduction of Gaps in the Literature

Blockchain technology has emerged as a viable solution in the financial sector, addressing inefficiencies and improving stakeholder transparency. Its application in banking is seen as an innovation catalyst, shedding light on emerging challenges and inspiring the adoption of new financial technologies across various business lines within banks (Ioannou & Demirel, 2022). However, a critical assessment of blockchain's performance in the banking system has revealed limitations despite its potential to enhance the financial sector (Cucari et al., 2022). The

study identified the prerequisites for implementing blockchain-enabled banking and supply chain financing, including collaboration among banks, integration with IoT systems for data integrity, and reforming regulatory and legal frameworks.

Implications for Biblical Integration

The performance of a business is significantly impacted by various factors encompassing operations, marketing, customer satisfaction, product quality, and managerial finance. Financial elements such as liquidity, financial leverage, growth, size, dividend policy, and profitability also play a crucial role in influencing performance. Profitability stands out as a critical component contributing to the success of a high-performing company (Religious Investors as Stewards of Faith, 2003). Consistently monitoring performance and achieving favorable results enable companies to attain heightened profitability, leading to new opportunities and improved performance ratings (Goodrich, 2012).

Incorporating biblical principles into business approaches allows for applying performance in a religious context. By regarding the resources possessed as divine assets, the interpretation of the Bible takes on renewed importance. This principle is stipulated in Leviticus 25:23 and Luke 19:12-26. Adhering to God's call for financial productivity (Luke 16:1-9; 1 Timothy 5:8) establishes individuals as God's stewards or managers who are held accountable (Exodus 19:5–6, 20:15–17; Luke 12:42–51) (Goodrich, 2012).

To ensure a business's success, the management team must effectively utilize the financial resources. Acting as good biblical stewards of the company's resources remains essential. Banking managers should develop a comprehensive long-term plan focusing on potentially disruptive technologies such as blockchain (Jongeneel, 2019). Long-term

performance issues could detrimentally impact the business, leading to a decrease in shareholder-held stock value.

Benefit to Business Practice and Relationship to the Field of Study

Blockchain technology uses cryptographic hashing to secure data in a database, rendering it immutable and resistant to fraudulent manipulations. This is achieved through a digital decentralized distributed ledger. Any modifications made to the ledger are immediately recorded, ensuring transparency and accessibility to authorized personnel. Additionally, the technology enables the integration of digital assets, facilitates remote management of Decentralized Autonomous Departments (DAD) by various networks, and supports the creation of digital currencies backed by traditional assets for lending purposes.

Furthermore, blockchain technology has the potential to significantly reduce costs and enhance efficiency, potentially replacing the current banking operations that rely on traditional databases. While it presents a disruptive threat to banking procedures, it also offers substantial opportunities for financial institutions to launch innovative services and applications. However, the decentralization of organizations through blockchain technology raises challenges, requiring the alignment of incentives among participants to avoid chaotic outcomes.

The excitement surrounding blockchain technology reflects its profound impact on financial business operations. Initially, deploying blockchain technology applications may be limited to private categories, ensuring only authorized entities can participate. This approach enhances the safety and value of decentralized ledgers. Applications under private blockchains could resemble current practices, focusing on reforming benchmark rates and prices. Adopting blockchain technology in financial business processes necessitates careful consideration to avoid potential disruptions. The potential and importance of blockchain technology in the financial

sector are widely acknowledged, signaling an early stage of development. Scholarly contributions can significantly enhance knowledge in this area of finance.

Summary of the Significance of the Study

The section discussed the implications of blockchain technology in the banking industry and its potential to enhance operational efficiency and shareholder value. It also touched upon the role of blockchain expertise in educational settings and its relevance for promoting economic growth. Additionally, it explored the integration of biblical principles into business approaches and emphasized the importance of effectively utilizing financial resources. It also highlighted the benefits of blockchain technology in enhancing transparency and reducing costs in banking operations while acknowledging the challenges associated with decentralization.

Summary

It is common to hear people describe blockchain technology as a game-changing innovation and the beginning of a new economic era. Many presumptions are made about blockchain technology in the financial sector. Some think blockchain technology has evolved beyond its initial connection to the Bitcoin payments business (Arjun & Suprabha, 2020). Blockchain technology can provide financial solutions by eliminating inefficiencies and encouraging banking innovation to help improve stakeholders' net worth. This study on the shareholders' net worth of banks caused by the disruptive nature of blockchain technology may be limited by several factors. However, the subject study is critical to help the academic community comprehend the empirical truth about blockchain in the banking sector. The result of this study can help the management of banks to maximize the financial resources at hand for them to prosper. To accomplish this, the management group must act as good biblical stewards

of the company's assets. Moreover, it is only feasible if the banking industry has a genuine interest in technology.

Chapter 2: Review of the Professional and Academic Literature

Business Practices

Blockchain is a system that utilizes cryptographic hashing to record information in a database, making it immutable and impossible to hack or defraud. The database is a digital decentralized distributed ledger. Since the ledger is distributed, any changes are recorded in real time to ensure transparency to all parties accessing a document. Blockchain technologies integrate distributed digital assets instead of copying or transferring them. Secondly, decentralized assets permit full real-time accessibility for all authorized personnel. The third concept involves transparency in the ledger of alterations, preserving the integrity of a document to influence trust in an asset. Therefore, banks can utilize the ledger to create Decentralized Autonomous Departments (DAD) controlled by various networks, computers, or nodes within the private control of the bank. It can also be utilized as digital currency collateralized by dollars that can be used to produce loans. Finally, smart contracts can perform lending logic (Wadsworth, 2018). All the above characteristics of a blockchain database can help control costs by saving time and improving efficiency.

As a result of the potential for cost-saving and efficiency improvement, blockchain has the potential to displace existing banking activities established on traditional databases (Dogru et al., 2019). The outcome is accountable for what underlies all financial service functions. Blockchain technology is highly likely to interfere with financial practices, as outlined above, making it a disruptive threat and a significant opportunity for financial businesses. Banks will have the opportunity to establish new services and business operations based on blockchains.

Blockchain can provide substantial foundations for novel services (Dogru et al., 2019). Blockchains are anticipated to become the base for new services in addition to an application.

Initially, blockchain technology applications may need to be rolled out under private categories, involving the central authority and its partners having permission to participate in the business practice. Incorporating applications under private blockchains provides more secure and beneficial characteristics for decentralized ledgers (Casey, 2018). However, it is necessary to note that these applications may not radically differ from current operations. An imperative area requiring transformation is reaching a consensus concerning benchmark rates and prices (Casey, 2018). Financial business practices may encounter several challenges with the introduction of blockchain technology. The excitement surrounding blockchain as an innovative form of distributed ledger technology demonstrates its potential impact on transforming financial business practices (Casey, 2018). The greatest challenge associated with blockchain technology in financial business is the decentralization of organizations. Members participating in the blockchain need to support financial functions that misalign incentives and contribute to chaotic outcomes.

The Problem

The study investigated the overall disruption impact of blockchain technology on traditional banking practices. The banking sector must acknowledge and adjust to this disruptive force. A decade ago, Satoshi Nakamoto, the enigmatic figure behind Bitcoin, illustrated how blockchain technology could be harnessed to address the challenges of transaction maintenance and preventing double spending in a decentralized setting (Zha et al., 2021). Subsequently, the ongoing advancement of blockchain technology has posed a substantial challenge to traditional banking practices due to its decentralized nature (Zuberi, 2017). Blockchain technology presents

an increasingly formidable challenge to the banking industry (Harris & Wonglimpiyarat, 2019). The specific problem was the need for more operational and cost controls, which impacted shareholder value within the banking sector due to the absence of strategic implementation of blockchain technology in commercial banking practices.

Concepts

Blockchain is an expanding directory of accounts or records called blocks, which are secured because they are linked together. They are linked together by a cryptographic hash, a timestamp, and transaction data (Gorkhali & Shrestha, 2020). Blockchain is a new technology and is the distributed data store of digital transactions. It is the ledger system behind cryptocurrency (Firdaus et al., 2019). This is a decentralized ledger, unlike a banking ledger. Blockchain can also be private.

Decentralized Autonomous Organization (DAO) is an automated and decentralized blockchain organization. It is a type of venture capital fund and does not have a management system (Sims, 2019). DAOs are not controlled by a single person or organization but by various networks, computers, or nodes because they take advantage of the decentralized system (Rikken et al., 2019).

Digital currency – Digital currency is a form of exchange produced, saved, and transmitted electronically (Wadsworth, 2018). It is not generally related to any nation.

Authority is characterized in tangible forms as the notes or coins of conventional currencies. Therefore, it is a currency only available in electronic or digital format (Agur et al., 2022). They are typically based on a decentralized system. Blockchain typically generates them. It is the opposite of fiat money (Lee et al., 2021).

A smart contract – is a decentralized application that performs business logic in reaction to events (Cong & He, 2019). In other words, digital contracts are self-executing based on the terms between two parties. These agreements are generated digitally using tokens powered by blockchain (Meier & Sannajust, 2020). Transactions are trackable and irreversible. They are held on a blockchain system. So, they are merely programs kept on a blockchain that run when preset terms are met. They are contracts between two individuals or entities in the form of computer code programmed to be implemented mechanically (Xiong & Hu, 2022). They permit designers to create apps that utilize blockchain security, reliability, and accessibility (Cong & He, 2019).

Theories

The trade-off theory of capital structure states that a company chooses how much debt and equity finance to use by balancing the costs and benefits (Abel, 2018). The theory's substantial purpose is to explain that corporations are usually financed partly with debt and partly with equity (Werner, 2016).

The financial intermediation theory of banking – Establishes that banks are purely financial intermediaries that collect deposits and lend them out. Banks create liquidity by borrowing short and lending long, meaning that banks borrow from depositors with short maturities and lend to borrowers at longer maturities (BoAa & Zimkova, 2020).

The credit creation theory of banking – Banks are said to produce credit and money out of thin air each time they execute a loan or acquire assets. Banks are not required to gather deposits or reserves to lend. Since bank lending is said to create new credit and deposit money, an increase in total balances occurs without a commensurate decrease elsewhere (Werner, 2016). Therefore, according to this theory, over time, bank balance sheets and money supply measures tend to show a rising trend in periods when outstanding bank credit grows (Lainà, 2019). The fractional

reserve theory states that only the banking system can collectively create money, while each bank is a mere financial intermediary, gathering deposits and lending these out (Faure & Gersbach, 2022).

Actors

Miners – People or organizations that receive digital currency to add blocks to a blockchain network. Their job is to verify transactions. This requires a lot of energy because they must solve mathematical equations.

Commercial Bankers – Managers of financial services. They are responsible for producing and delivering commercial services. Their customers are typically wealthy individuals, investors, companies, and other organizations.

Shareholders – A company's owners, typically represented as equity or NW on balance. A person or company that owns at least one share in a company's stock. Shareholders usually benefit from the increase in a company's success or realize the negative impact of a company's losses. Therefore, they have an interest in the performance of a company.

Federal Reserve—The United States central bank monitors risks related to the financial system to keep it healthy. This organization provided data for the subject study.

US Securities and Exchange Commission - The SEC regulates securities dealers and brokers, securities exchanges, and mutual funds to encourage honest commerce, investment advisors, the disclosure of critical market data, and to counteract fraud. This organization will be a source of data for the subject study.

Constructs

Blockchain technology – This is a database concept outlined above. It is primarily in the conceptualized phase of its development. This study verified how much effect it has on the banking industry.

Commercial lending – The area of banking where the bank engages in a relationship with a corporate borrower to provide financing at a predetermined interest rate. This area of the bank was the focus of the study.

Variables

Net worth/equity = Dependent variable—Its value depends on changes in expenditures—the value of the company's assets minus all liabilities. The change in value helped the researcher understand whether the implementation of blockchain technology has a positive or negative effect on the company.

Expenditures—Independent variables helped the researcher explain net worth/equity. Expenditures are the activity of consuming funds and tracking the number of funds spent for a particular category. They are measurable and were tested based on quantitative statistical data from various banking institutions.

Related Studies

The Impact of blockchain on Banking Processes

Cucari (2022) suggested that blockchain technology is disturbing conventional banking practices. This study developed many ideas that could establish a structure to build my study on going forward. Cucari (2022) analyzes the case of ABI Lab, a banking research and innovation center founded and promoted by the Italian Banking Association and the first European example of the application of blockchain technology to banks' back-office activities. The researcher indicated that the subject study was one of the first to approach this immediate area of research

by focusing on other fields rather than back-office problems (Cucari, 2022). The second contribution reveals the mechanism that enables blockchain technology to improve the efficiency of banks through interbank reconciliation (Nandi, 2020). The third contribution outlines several potential future research directions, maintaining that these technologies' impact will interest financial intermediaries and their customers (Cucari, 2022). This is a critical study that the researcher can build on to show how blockchain technology is causing a significant disturbance to conventional banking practices.

The research by Rajnak and Puschmann (2020) contributes to the emerging literature on blockchain, business models, and the strategic use of IT. This research aimed to examine how blockchain elements might change banks' business models in the future. The study posits that blockchain technology will reshape existing business models in the financial services industry (Rajnak, 2020). It also suggests that a business model mediates IT innovation. However, although blockchain is often seen as a strategic technology, research focusing on its impact on business models remains rare. This research derives a hypothesis model that connects IT innovations with the three generic value disciplines of banks—"operational excellence," "customer intimacy," and "product leadership"—as well as the four generic elements of business models: "what," "who," "how," and "value" (Rajnak & Puschmann, 2020). Data from an international interview of 104 financial services institutions and start-up companies were applied to test the hypothesis model. The results support the hypothesis that all three value disciplines might be impacted by blockchain technology in the future (Rajnak, 2020).

The Pros and Cons of Implementing Blockchain

According to Cocco et al. (2017), the challenges and opportunities of implementing blockchain technology across banking are significant considerations for the potential of this

disruptive technology. The study reviewed blockchain technology's potential to optimize the global financial infrastructure and achieve sustainable development using more efficient systems than currently available (Broome, 2019). For example, many banks are focusing on blockchain technology to promote economic growth and accelerate the development of green technologies (Dozier & Montgomery, 2020). To understand blockchain technology's potential to support the financial system, they studied the actual performance of the Bitcoin system, highlighting its major limitations, such as significant energy consumption due to high computing power requirements and high hardware costs (Chen et al., 2022). They estimated the electrical power and hash rate of the Bitcoin network over time and, to evaluate the efficiency of the Bitcoin system in its actual operation defined three quantities: "economic efficiency," "operational efficiency," and "efficient service." The results show that by overcoming the disadvantages of the Bitcoin system and, therefore, of blockchain technology, financial processes could be handled more efficiently than under the current system. They considered two features: the hash rate and power consumption. Using two fitting curves, they computed the "best hash rate per $," R(t), and the "best power consumption function," P(t). They defined three quantities: "economic efficiency" (EE), "operational efficiency" (OE), and "efficient service" (SE).

The Governance of Blockchain

The Governance of blockchain is a method of recording entitlements and enforcing rights, which has increasingly captured the interest of businesses and governments. The discussion is related to blockchain technology, which is known as smart contract. The article explores ways to utilize it with financial assets, such as securities, fiat money, and derivative contracts. This study formed a conceptual structure for the governance of blockchain-based networks in the financial industry. This structure could help financial regulation, and private law

should set the boundaries of this modern technology to protect market participants and societies while simultaneously allowing room for innovation (Paech, 2017). It reviewed financial market activity conducted through blockchain networks that pose similar risks to those existing in the current intermediary-based market, including issues regarding resilience and financial stability, market distortion, and illegal activity. It reviewed the distributed record, which is capable of storing complex information such as auto-executable financial transactions, which will bring immense efficiency gains to financial markets. It reviewed the features of the original, Bitcoin-inspired model of blockchain-based networks that are unsuitable for use in financial markets from the point of view of effective governance. This intermediary-client approach, one of the cornerstones of regulation, is inefficient, and a distributed, all-encompassing database may be more efficient and less costly (Rajnak, 2020).

Emergence of Blockchain Technology

Jayasuriya Daluwathumullagamage and Sims (2021) focus on emerging blockchain technology, especially in banking, which simultaneously interacts with and challenges firms, traditional financial intermediation methods, stakeholders, and financial markets. This study describes how to implement digital transformation and respond to the disruption in a specialized Iranian bank (Bank Maskan), the steps involved, and how to navigate these steps. As outlined in the article, these factors inform the motivation to focus on adopting blockchain banking (Liang et al., 2021). According to the study, it was the first research to conduct a systematic review of blockchain adoption solely focused on banking (Fernandez-Vazquez et al., 2019). The researchers aimed to demystify blockchains and highlight the widespread development and adoption of different blockchain platforms in banking. The study combines the widely dispersed blockchain literature concerning banking and coherently identifies trends, issues, adoption

drivers, and limitations. The study further identifies blockchain adoption's behavioral, social, economic, regulatory, and managerial implications in banking. The study could interest banks, fintech companies, investors in banks and fintech, regulators, and other stakeholders (Brown & Piroska, 2022).

Brown and Piroska (2022) concluded that academic and industry literature focuses on common themes such as blockchain, fintech, and technology. However, a disparity arises concerning individual blockchain applications in banking, with industry reports focusing more on banking use cases and academic literature primarily focusing on fintech and cryptocurrencies. They also identified areas underexplored in academic and industry literature, such as corporate voting, trading, and exchanges (Jayasuriya Daluwathumullagamage & Sims, 2020). The study further highlights blockchain adoption challenges in banking, including but not limited to reputation issues, culture, interoperability, scalability, latency, privacy and security, regulation, and energy consumption (Bhat et al., 2021).

Parra Moyano and Ross (2017) suggested that a blockchain system can reduce the aggregated cost of KYC in a jurisdiction through distributed ledger technology (DLT). This blockchain's main efficiency gain is avoiding the duplication of the same tasks by different financial institutions. Moreover, this paper has shown how it is possible to distribute the costs of the core KYC verification process proportionally among those financial institutions (Parra Moyano & Ross, 2017). These solutions require the verification process to be carried out for a given customer. They have defined a series of conditions the blockchain system needs to fulfill to ensure the correct incentive structure for participating institutions (Alkan, 2021). The maximum cost saving per customer generated by the proposed blockchain system can be measured and is the cost of conducting a complete core KYC verification for a customer (Paech,

2017). The study implies that the monetary savings brought about by the proposed blockchain system and the increased efficiency it would deliver for customers and institutions are significantly affected by the number of financial institutions participating (Paech, 2017). The proposed blockchain system emerged from the application of design science research to the problems of high costs for financial institutions and the low satisfaction of customers when conducting a core KYC verification process (Viktoria Rajnak, 2020).

This Research Study

This research conducted virtual interviews with fifteen participants to identify key themes in financial data analysis. The themes encompass income statements, balance sheets, product suitability, efficiency, limitations, and time. Notably, the income statement signifies profitability, the balance sheet signifies value, and other themes reflect factors influencing financial value positively or negatively. These findings were utilized to explore the implications of blockchain technology, highlighting its potential for cost savings, efficiency improvement, and the creation of new revenue streams. Specifically, blockchain technology was found to reduce bank transaction costs, automate contracts, and minimize infrastructure expenditures.

Furthermore, banks can diversify their revenue streams through services like blockchain as a Service (BaaS) and the creation of new financial products based on blockchain technology. Overall, leveraging blockchain technology can foster innovation and enhance profitability in the digital financial landscape. The research also delineated the substantial challenges of integrating blockchain technology into banking operations. These hurdles encompass scalability, costs, transaction speeds, and regulatory ambiguities, which could impede the widespread adoption of blockchain technology in the banking sector. Furthermore, the study emphasizes the comprehensive data analysis, interpretation, and presentation of research findings, all

encapsulated in the third chapter of the study. The employed methodologies are inferential and descriptive, incorporating frequency calculations, statistical analyses, and hypothesis testing, conclusively revealing a robust correlation between blockchain technology and the banking industry.

Anticipated Themes

Disruptive Behavior

The financial sector is poised for disruption due to blockchain technology. According to Jayasuriya Daluwathumullagamage and Sims (2021), digital disruption alters business models and substitutes digital services for traditional ones, opening new market opportunities. Blockchain will restructure banks, rewriting procedures, organizational structures, and business practices, which could harm the financial sector (Jayasuriya Daluwathumullagamage & Sims, 2021). Understanding the causes of blockchain's disruptive nature is crucial. This includes using blockchain technology to establish a secure digital ledger that tracks digital interactions on the internet, is resistant to forgery through trustworthy time stamping, and propagates a distributed database. Decentralized autonomous organizations (DAOs) are also known for this. With this approach, including a third party that both parties can agree on and trust is no longer necessary for any decentralized digital communication or bitcoin transaction. By eliminating the need for a trusted third party and the recurring storage of contract exchanges for various transactions, it may be possible to significantly reduce the costs of blockchain-enabled transactions and associated data reporting. For instance, if the governing body approves, public documents like deeds and titles could theoretically be replaced by blockchain data. A DAO may operate without human administrative interaction once launched, provided the platform is Turing-complete and supports smart contracts, according to Vandezande (2020). Ethereum, established on a

blockchain and launched in 2015, has been described as meeting this threshold, thus enabling such DAOs. DOA aims to be an open platform through which banks can control their operations and internal data. Ethereum, a blockchain-based system started in 2015, meets the requirement, enabling such DAOs. To provide banks autonomy over their internal data and processes, DOA seeks to be an open platform. The disruptive nature of blockchain presents a significant opportunity for this paper because it creates many issues to solve in this sector.

Study Based in Other Countries

Research has been conducted in other countries. ABI Lab, a center for banking research and innovation established and supported by the Italian Banking Association, represents the first instance in Europe of using blockchain technology for banks' back-office operations (Cucari et al., 2022). Another study addressed a specialized Iranian bank's digital transformation and disruption (Paech, 2017). Understanding how blockchain technologies are applied in other nations will provide this study with a broader and deeper perspective on their impact on the financial sector. Studying blockchain abroad could be a helpful starting point for this research. It is essential to highlight the three main drawbacks of blockchain technology—scalability, security, and regulation—and illustrate how these issues might affect the technology's use and adoption.

Types of Research Methods

Some studies used quantitative methods. For example, one article stated that a systematic review included 407 final articles from 2013 to 2020 from an initial record search of 1,979 articles (Jayasuriya Daluwathumullagamage & Sims, 2021). The same study indicated that it was the first to conduct a systematic review of blockchain adoption solely focused on banking, develop a framework for banking-based blockchains, and identify gaps and parallels between industrial and

academic literature (Jayasuriya Daluwathumullagamage & Sims, 2021). It combined the widely dispersed blockchain literature concerning banking and coherently identified trends, issues, adoption drivers, and limitations (Jayasuriya Daluwathumullagamage & Sims, 2021). Another study reviewed identified a disparity between individual blockchain applications in banking, with industry reports focusing more on banking use cases and academic literature primarily focusing on fintech and cryptocurrencies (Jayasuriya Daluwathumullagamage & Sims, 2021). Another study used a mixed research method, establishing a hypothesis model that used data from an international interview of 104 financial services institutions and start-up companies (Rajnak & Puschmann, 2020; 2021). This study also used regression analysis, revealing that banks' operations could be significantly changed (Rajnak & Puschmann, 2020; 2021). Finally, another study indicated that a case study shows the potential for organizational, operational, and economic influences to be managed in a blockchain-enabled back-office process **(**Cucari et al., 2022). Understanding different research approaches will help direct this study. Familiarity with the research techniques employed in a field of study is crucial for understanding financial growth and development, as it opens a wide range of research design options.

The Banking Industry Can Benefit from Blockchain Research

The knowledge from this research paper benefits the banking industry because blockchain technology can optimize the global financial infrastructure and achieve sustainable development using more efficient systems than currently available (Cocco et al., 2017). Research indicates that the financial system would benefit from highlighting how well blockchain technology can help the financial system (Cocco et al., 2017). Other research suggests that the anticipated blockchain revolution would be primarily technological, introducing new methods of transaction processing, recording, and reporting that will significantly increase the financial market’s

efficiency (Paech, 2017). According to research studies, banks, fintech companies, investors in banks and fintech, regulators, and other stakeholders would find the analysis conducted by researchers to be of interest (Jayasuriya Daluwathumullagamage & Sims, 2021). Customers would benefit from knowing that bank experts have attempted to digitize the entire journey by identifying five sections, including customer discovery, customer credit, familiarizing customers with available services and loans, and lending to clients according to laws and regulations (Jayasuriya Daluwathumullagamage & Sims, 2021). One of the significant trends in the financial services sector today is blockchain. Top financial industry executives prioritize blockchain due to its numerous advantages in the banking sector. Blockchain accelerates payments in the banking industry by creating a decentralized payment system that enables quicker payments. Banks can use blockchain because it provides the highest level of security and the lowest payment transmission costs. When implementing blockchain, banks do not need third parties to verify transactions. This paper will explain the possibilities of limiting third-party participation in the banking process to improve shareholder net worth.

Efficiency and Low Cost

Various studies indicated that higher efficiency could be achieved with blockchain technology. For example, one study stated that blockchain technology improves the efficiency of banks by interbank reconciliation (Cucari et al., 2022). It can foster the operating strategies of banks, especially an ambidexterity strategy (Cucari et al., 2022). Another study indicated that banking groups are looking for innovations that can strengthen different areas of their business and allow them to compete with new competitors. In this context, blockchain and distributed ledger technology (DLT) play a crucial role in the evolution of the banking system (Cucari et al., 2022). Paech (2017) found that the facilitation of financial services brought about by this new

database reduces the operational burden and decreases reliance on intermediaries and infrastructures. Another study indicated that introducing blockchain technology to financial infrastructures could address financial issues more efficiently than current financial systems (Cucari et al., 2022). The financial market will benefit because another study reviewed the distributed record, which can store complex information such as auto-executable financial transactions, bringing immense efficiency gains to financial markets (Paech, 2017). Another study reviewed that it could help decrease the regulatory costs of KYC and lower the barriers to operating a financial institution, thus opening the financial market to further competition (Parra and Ross, 2017). This research will show how more efficiency and lower cost savings will help improve shareholder net worth.

Blockchain Can Improve Customer Service

Blockchain technology could contribute to the presentation of five propositions. The study outlines several potential future research directions, maintaining that these technologies' impact will interest financial intermediaries and their customers. Specifically, the propositions can be summarized as follows. Blockchain, as applied in the DLT Interbank Spunta: (i) modifies the organizational culture, acting as a catalyst; (ii) is fostered by coopetition strategies; (iii) enhances competitiveness and performance within an ambidexterity strategy; (iv) improves information processing; and (v) reduces operational risks (Cucari et al., 2022). The research identified that the bank's digital transformation goal is to digitalize the customer journey from beginning to end with a digital customer-centric strategy (Jayasuriya Daluwathumullagamage & Sims, 2021). This demonstrates how quickly blockchain is advancing in the banking sector, and this study will continue to fill in the gaps in this area of study.

The Beliefs System Towards Blockchain

The idea is that banking firms should endeavor to widen their product and service portfolios, increase the quality and efficiency of the services they currently provide, and, where possible, alter their business models by strengthening their resilience (Cucari et al., 2022). Additionally, blockchain technology has numerous prospects to improve financial system efficiency (Parra & Ross, 2017). Some believe such a system could significantly reduce costs for participating institutions and enhance client experience (Ross & Parra, 2017). Another theory posits that reduced KYC regulatory expenses will lessen operational obstacles for financial institutions, fostering more competition in the financial sector (Parra & Ross, 2017). According to some, blockchain technology is still in its infancy, and concerns about user data privacy in such a system must be fully addressed (Parra & Ross, 2017). Another idea is that blockchain technology may present new ways to enable distributed but private document exchange between clients and financial institutions, including potential storage options for more crucial information (Parra & Ross, 2017). Research has also demonstrated how financial institutions can share proportionally in the primary KYC verification process costs.

These solutions require the verification process to be carried out for one given customer and have defined a series of conditions that the information system in question needs to fulfill to ensure the correct incentive structure for the participating institutions (Parra & Ross, 2017). The belief is that blockchain technology implementation implies that the monetary savings and the increased efficiency it would deliver for customers and institutions are significantly affected by the number of financial institutions participating in the system (Parra & Ross, 2017). These solutions stipulate requirements that the information system must meet to ensure the correct incentive structure for the participating institutions, including the need for the verification

process for a specific consumer (Parra & Ross, 2017). It is believed that the number of financial institutions using blockchain technology will substantially impact the financial savings generated by the proposed blockchain technology and the greater efficiency it would provide for clients and institutions (Parra & Ross, 2017). This research will help shape the belief system towards blockchain in the banking industry.

Why is Blockchain for Banks?

Blockchain technology is predicted to reshape existing business models in the financial services industry (Rajnak & Puschmann, 2020; 2021). It is a model that connects IT innovations with banks' three generic value disciplines: operational excellence, customer intimacy, and product leadership, as well as what, who, how, and value (Cucari et al., 2022). All banks need to be prepared to take advantage of this opportunity rather than view it as a threat, as it might challenge the relationships within the system. Furthermore, banks must innovate through blockchain implementation or risk being left behind in such a rapidly evolving technological environment (Cucari et al., 2022).

Furthermore, blockchain might lead to new business models in banking and thus challenge the status quo (Rajnak & Puschmann, 2020). Although blockchain is expected to provide several specific features like efficiency, decentralization, transparency, trust, and security, banks do not proactively explore opportunities in areas like product innovation or novel service offerings by enhancing back-office processes and improving their customer focus (Rajnak & Puschmann, 2020). The same study suggested that the development of blockchain technology resulted from applying design science research to the issues of high costs for financial institutions and low customer satisfaction while carrying out a crucial KYC verification process (Parra & Ross, 2017). Another point is that the General Data Protection Regulation

(GDPR), which took effect in 2018 (European Commission 2016), already addresses the paradigm shift regarding consumer data because the smart contracts in which the information is stored would be owned by the customers and not by the participating institutions (Parra & Ross, 2017). Blockchain requires changes in the financial market infrastructure, and governance models are needed (Rajnak & Puschmann, 2020; 2021). As a result, blockchain-based new business models for banks depend primarily on organizational and cultural changes within the application enterprises rather than technology modifications (Rajnak & Puschmann, 2020; 2021). Based on the results, this study will aid in preparing banks for the upcoming blockchain frontier.

Summary of Chapter 2 and Transition

This analysis suggested blockchain might change the banking landscape in the US and other nations. The data demonstrates the researchers' theories about blockchain technology, supported by the review. This information was gathered through numerous investigations that employed both quantitative and qualitative research methodologies. The outcome of these studies reveals who in the banking industry can gain from this kind of research; it can help to increase productivity and cut costs; it can help to enhance customer service; and it reveals why banks should implement blockchain, what banks must do, and how the regulator should react to this new technology. This research also outlines certain blockchain limitations.

Finally, the analysis contends that blockchain technology impacts all facets of banks' business strategies (who-what-how-why). Blockchain may result in new financial business models, upending the status quo. Second, despite efforts by banks to incorporate blockchain into their current business models, no progress was visible. Lastly, the many claims that the respondents made considering the importance and potential of blockchain revealed that the

technology is still in its very early stages of development. This presents an excellent opportunity for this paper to add scholarly knowledge to this area of finance.

This research conducted virtual interviews with fifteen participants to examine financial data. The study pinpointed critical financial data analysis themes, including income statements, balance sheets, product suitability, efficiency, limitations, and time. Income statements signify profitability, balance sheets denote value, while other themes encapsulate factors that can positively or negatively impact financial value. The findings underscored the potential of blockchain technology, emphasizing its capacity to drive cost savings, enhance efficiency, and create new revenue streams. Specifically, the research noted that blockchain technology can reduce bank transaction costs, automate contracts, and diminish infrastructure expenses.

The study also underscored that banks can significantly expand their revenue streams by providing services like BaaS and devising new financial products grounded in blockchain technology. It further emphasized the potential transformative impact of blockchain technology in fostering innovation and bolstering profitability within the digital financial industry. However, the research also outlined the substantial challenges associated with integrating blockchain technology into banking operations, encompassing scalability, expenses, transaction speeds, and regulatory uncertainties, which could impede the widespread adoption of the technology.

Moreover, the study concentrated on meticulously analyzing, interpreting, and presenting research findings, which are extensively discussed in the third chapter. The methodologies employed encompassed inferential and descriptive analyses, integrating frequency calculations, statistical analyses, and hypothesis testing. Ultimately, the research unveiled a strong correlation between blockchain technology and the shareholder's net worth in the banking industry.

Chapter 3: Methodology

Introduction

Data collection was crucial in uncovering accurate information about the impact of blockchain technology on shareholder net worth in the banking industry. The following section outlines the importance of accurate data collection to fulfill the researcher's primary responsibility of choosing the most effective qualitative and quantitative data-gathering methodologies and ensuring precise data collection from reliable sources. Several options are available, among which data gathered by the Federal Reserve and bankers stood out as superior for evaluating how blockchain technology influences the banking sector and shareholder value.

Purpose Statement

This study aimed to elucidate the development of blockchain technology and its potential impact on the banking industry. The rapid expansion of blockchain, particularly with the rise of cryptocurrencies such as Bitcoin, has attracted significant attention and utility in the market (Calvão, 2019). Many businesses perceive this technology as promising, particularly in the financial sector. Consequently, blockchain technology can play a pivotal role in shaping new financial systems beyond just being a platform for digital currencies. Smart contracts offer versatile applications, including document validation, the management of ownership rights for both physical and digital assets, and preventing fraud. This study explored the evolution of blockchain and its advantages in the context of future trends in banking. By integrating data about blockchain technology, the researcher attempted to comprehend their potential synergy with established banking and finance theories. As these theories constitute the foundational operational elements of this study, the convergence of commercial lending and blockchain technology is envisioned to streamline processes and products, thereby reducing costs.

Stakeholders leverage these theories as financial instruments to enhance regulatory compliance and operational efficiency within the banking environment. Through the implementation of blockchain and its ongoing development, the study findings underscore the potential for blockchain technology to diminish expenditures as an independent variable, consequently augmenting the dependent variable, shareholders' net worth.

Role of the Researcher

The research followed a systematic approach focused on objectivity and comprehensive data collection for analysis and decision-making. The procedure involved obtaining banking information from both bankers and regulators. The research was conducted in multiple steps, with each stage interconnected (Hagues, 2021). The researcher initially defined the population before formulating a data collection strategy, gathering data, and conducting data analysis.

Defining the Data Population

The research objective and the selected topic were crucial in directing the researcher toward the appropriate data source. Acknowledging the data source offers several advantages for the research. Firstly, it helped to focus the study on a more manageable subset of the larger cohort (Wijnberg, 2020). Secondly, it facilitated the researcher's targeting of a specific demographic, thus ensuring the research remained on track (Wijnberg, 2020). Moreover, it allowed for identifying the relevant data set to which the research findings are applicable.

Instrumentation

The researcher assumed the role of an unbiased observer during data collection and analysis. By establishing a systematic framework for data coding, the researcher aimed to minimize potential bias and facilitate the conversion of raw data into actionable knowledge and insights. To enhance the reliability and validity of the research findings, the researcher

synthesized a wide range of observations, verified and interpreted the findings, and employed triangulation (Martinez et al., 2014). Fundamental discoveries were initially disclosed, along with the level of concurrence among banking professionals, confidence intervals, and frequency of insights (Martinez et al., 2014). These measures were taken to ensure the transferability and credibility of the data. The design of the instruments used in the study served as a comprehensive roadmap and was diligently implemented by the researcher. The researcher specifically outlined the locations, timing, and methods of data collection and their respective purposes. Although various options were available, the Federal Reserve, as the cornerstone of the banking system, was deemed to provide the most reliable data to gauge the impact of blockchain technology on the banking system and shareholder value (Bailey et al., 2001). An archive of speeches and written materials, primarily sourced from the Federal Reserve between 2012 and 2023, formed part of the study's strategy. These speeches and articles were stored in a database, enabling the researcher to conduct searches based on cost, profitability, constraints, products, time, and efficiency terms. The data was examined to establish potential correlations between the variables, and tests were conducted to determine whether any differences were statistically significant (Bailey et al., 2001). The study findings substantiated the theory.

Data Collection

The researcher recognized the critical nature of data collection in acquiring the knowledge necessary to address the research question(s). The key objectives of qualitative data analysis included amalgamating, condensing, interpreting findings, and establishing the relevance and significance of the data (Roh et al., 2021). The researcher postulated that due to the extensive volume of data generated by qualitative research, it is commonly perceived as burdensome by many researchers (Roh et al., 2021). Furthermore, the researcher acknowledges

the complexity of qualitative data analysis, attributing it to the absence of standardized methods. It is noted that comparative analysis is prevalent in qualitative data, and many researchers utilize a comparative approach (Lyons and Coyle, 2022). Lyons and Coyle (2022) also discussed various techniques that researchers may employ in conducting qualitative analysis, with the application of text coding as an example of such methodology.

Bracketing Elements

To conduct the subject research with impartiality and objectivity, the researcher consciously set aside personal opinions through a process known as bracketing. This involved acknowledging and disregarding personal prejudices in various ways. One approach was to become aware of these biases and consciously disregard them. Another method was "forced choice," as Schmidt et al. (2014) detailed. Under this approach, the researcher generated multiple options and was then compelled to select from them, thereby mitigating the influence of instinct and personal biases in decision-making. Consequently, the researcher overcame bias by acknowledging and setting aside their prejudices.

Furthermore, the researcher adopted stringent data collection measures, sourcing information from multiple reliable sources such as the Federal Reserve and interviewing bankers. This balanced approach aimed to eliminate biases and remain mindful of potential adverse consequences while analyzing dependable data (Newell, 2021). By adhering to such practices, the researcher could adeptly identify and momentarily set aside personal opinions and biases to ensure an unbiased data assessment.

Summary

In this segment of the study, the discussion centered on the crucial role of selecting pertinent data sources for research and how such selection aids in refining the focus of the study

and identifying pertinent data sets. The researcher underscored the significance of impartial data collection and analysis, emphasizing systematic frameworks, triangulation, and comprehensive instrumentation. Furthermore, the researcher highlighted the importance of qualitative data analysis, delving into its intricacies and proposing methods for managing qualitative data. Moreover, bracketing was explored to set aside personal biases and ensure objectivity. The researcher also implemented rigorous data collection procedures from reputable third-party sources to mitigate biases.

Research Methodology

Introduction

The methodology applied in data collection plays a critical role in shaping the outcome of a research study. The findings and results of this study were notably impacted by the specific approach taken in structuring the research. To enhance the validity and reliability of the gathered data, the researcher adhered to a systematic process and incorporated a diverse sample. The research design encompassed various elements, including the population, sampling technique, sample size, data collection methods, research instruments, and data analysis procedures.

The Appropriateness of a Mixed Method for the Research Study

The study employed a convergent parallel design, a methodology commonly associated with mixed methods research. This approach involved the simultaneous collection of qualitative and quantitative data, followed by independent analyses and subsequent comparison and integration of findings. Given the intricate and dynamic nature of the subject under investigation, a mixed-method design was particularly well-suited. Qualitative data, encompassing non-numerical, descriptive information concerning the characteristics and attributes of the research subject, including emotions, thoughts, and experiences, was gathered through interviews with

bankers. Conversely, quantitative data, comprising numerical information, was obtained by analyzing textual references to blockchain and shareholders' net worth in speeches and testimonies provided by FOMC members on the Federal Reserve website. Under the convergent parallel design, these distinct data sets were collected and analyzed concurrently and separately, capitalizing on the strengths of qualitative and quantitative research methodologies. The ensuing results were then juxtaposed and merged to analyze the research question comprehensively (McArdle, 2022).

The Appropriateness of the Chosen Method for the Research Study

The research employed a mixed-method approach to assess both qualitative and quantitative methods. This approach facilitated a comprehensive analysis of blockchain technology in the banking industry, yielding a more profound understanding by examining the issue from qualitative and quantitative perspectives (Yin, 1994). The qualitative phase explored bankers' perceptions and experiences regarding blockchain technology and its impact on the banking sector. On the other hand, the quantitative phase focused on variables and relationships, employing word count as a measure. This mixed-method approach was advantageous due to the limited data available for research in this emerging field.

However, it is essential to note that the mixed-method approach presented privacy risks and biases (Han et al., 2019; 2020), mainly as the research required semi-sensitive data from bankers. While the fixed method was limited by set interview questions, the researcher delved beyond these initial questions to gain a more comprehensive understanding of the participants' perspectives (Tarnoki & Puentes, 2019). Additionally, the artificial and controlled nature of the research setting, which was not conducted in the bankers' everyday environment, could have influenced the outcomes and perceptions (Jackie & Recio, 2020).

The Appropriateness of the Chosen Method for Triangulation for the Research Study

This research analysis focused on comprehending the impact of blockchain technology on shareholder net worth within the banking industry. Quantitative and qualitative data were gathered for comprehensive analysis using a mixed-method research approach. The triangulation method was utilized to evaluate and validate the research from various perspectives (Mak et al., 2021). Data was meticulously organized and verified through various database tests during the quantitative phase. A structural equation model examined the disparities and proposed connections between shareholders' net worth and blockchain efficiency. The experiment incorporated the dependent variable of equity or net worth and the independent variable of expenditures or costs.

In the qualitative research, the investigator conducted interviews to inquire about participants' experiences and sentiments, while also elucidating the application of blockchain technology. These inquiries centered on the perceptions, experiences, cognitions, and emotions of banking professionals. The semi-structured interview similarly centered on specific topics but allowed for unscripted discussion. In the mixed method, the researcher learned how blockchain technology's implementation impacted a bank's net worth. The ensuing results were then juxtaposed and merged to analyze the research questions comprehensively.

Summary of Research Methodology

The research study examining the influence of blockchain technology on banks' shareholders' net worth benefited from the utilization of a mixed research design method. By incorporating both qualitative and quantitative research approaches, the study gained comprehensive insights into organizational mechanisms and processes. This mixed research design not only aligned with the study's objectives to develop alternative approaches for

understanding the impact of blockchain but also yielded valuable results in assessing its effect on the banking industry. The study revealed significant insights into how implementing blockchain technology affects a bank's net worth (Mak et al., 2021**).**

Participants

The participants for this study are from the Federal Reserve and other banking professionals. The Federal Reserve staff participants collaborate closely with board members to study and apply blockchain technology in the banking sector. Other banking experts are those who work for various national and regional banks and have experience with blockchain technology. Understanding the Federal Reserve system is essential. The Federal Reserve Act established the Federal Reserve (The Fed) in 1913 to act as the country's central bank (Tokic, 2018). The system has three key entities: The Board of Governors, the Federal Reserve Banks, and the FOMC. The Fed oversees five essential functions: conducting the nation’s monetary policy, promoting the stability of the financial system, promoting the soundness of financial institutions, facilitating U.S. dollar transactions, and promoting consumer protection (Tokic, 2018). The twelve banks that make up the Federal Reserve each have their president and are divided into geographical regions with similar economies (Huang et al., 2022). The twelve Federal Reserve banks are all under the control of the Board of Governors (Knodell, 2023). The FOMC's role is the most well-known among the Fed's operations. The committee's congressionally mandated objectives of boosting employment and attaining price stability impact the entire U.S. economy. Out of the twelve regional Federal Reserve Bank presidents and all seven members of the board of Governors, only five bank presidents—the president of the New York Fed and four other presidents who rotate through one-year voting terms—vote at a time. At the federal level, the FOMC plays a major role in determining American monetary policy.

The primary monetary policy tool used by the FOMC is the federal funds rate target. According to Burke and Christofi (2019), this is the benchmark interest rate that banks charge one another when they lend each other money stored with the Federal Reserve. Borrowing from one another becomes more expensive when the Fed raises interest rates. The costs are subsequently transferred to customers by banks by raising interest rates. Fewer loans are obtained when borrowing money is more expensive, which drains the economy of its resources. The converse occurs if the Fed lowers the rate. Lending money becomes more affordable. More loans are made, and more money enters the economy when borrowing costs are lower. To fulfill its dual purpose, the Fed also sets goals for employment and inflation. The long-term target for inflation set by the Fed is a 2% annual increase. The Fed does not try to match any numerical target to achieve maximum employment. Instead, it develops legislation to deal with issues affecting the labor market. The FOMC has also employed the purchasing and selling of assets backed by the Treasury Department as a monetary policy tool in times of economic emergency. Bonds and other securities are assets that U.S. banks own (Knodell, 2023). By enabling banks to extend more loans to individuals and companies, the Fed increases the amount of money in the economy when it purchases assets. This is referred to as quantitative easing. The FOMC can then sell those assets when inflation picks up and the economy starts to grow, lowering the amount of money in circulation. It is anticipated that this will reduce inflation.

Description of the Type of Individual(s) Who is Eligible to be Included and Why

The FOMC of the Federal Reserve's statements and testimonies will serve as the sampling source for this study. The United States' central banking system is the Federal Reserve. Reserve banking activities include payment services, bank supervision and regulation, and monetary policy (Clarida, 2020). The Federal Reserve governs the amount of money in the

banking industry. The chairman of the Federal Reserve is normally from an economic background. The members of the Federal Reserve are selected by the President of the United States and come from a variety of backgrounds (Huang et al., 2022). Candidates may have prior work experience in the legal industry, education, business, the military, or government. They are selected based on what they have said about the operation of the economy. They are suitable for this study because they are the top bankers in the country, and their speeches and testimonies are a direct projection of their financial philosophy (Clarida, 2020). The study will also include employees who support the open market committee and other bankers who are familiar with the subject technology. These employees and bankers have various skill levels.

Population and Sampling

Introduction

This study gathered data from the speeches and testimonies from the FRED database by the top bankers in the nation who supervise and manage the money flow into the economy. These individuals were selected as participants (Mendez-Carbajo, 2020). The Federal Reserve members who perform speeches and give testimonies to Congress are responsible for promoting the stability of the financial system, the soundness of financial institutions, and the financial risk of the financial system. They also contribute to ensuring that the financial system supports a robust economy. Blockchain is a financial tool that the Fed can use to help banks stabilize and add shareholder value. Therefore, the researcher used a small sample size from the greater bankers’ speeches and testimonies to demonstrate how blockchain affects shareholders' net worth in the banking industry. Finally, the researcher gathered qualitative data by interviewing bankers.

Discussion of Population

Describe the Characteristics of the Eligible Population

The speeches and testimonies from the regional Federal Reserve Bank of the United States members from the Federal Reserve Board of Governors website in Washington, D.C., were used as participants in this qualitative study. The Beige Book and the FRED database are products of the Fed's extensive economic research, resulting in a wide range of resources. The best source for this investigation is the FRED. The FRED, or Federal Reserve Economic Data, is an online database that contains thousands of economic data time series from numerous domestic, foreign, public, and private sources. The FOMC is the division of the Federal Reserve System (FRS) that manages open market operations (OMOs), which are used to steer monetary policy in the U.S. Twelve people make up the group, including the president of the Federal Reserve Bank of New York, four of the other eleven Reserve Bank presidents, and seven members of the Board of Governors. The FOMC meets eight times a year to analyze financial and economic conditions, decide on the best course for monetary policy, and evaluate threats to its long-term objectives of price stability and sustainable economic growth (Stratton, 2023). All decisions relating to the conduct of open market operations, which have an impact on the federal funds rate (the rate at which depository institutions lend to one another), the size and makeup of the Federal Reserve's asset holdings, and public communications about the likely future direction of monetary policy are made by the FOMC.

The research project involved gathering primary data from bankers through in-depth interviews. These bankers are critical in informing clients about various credit products and banking solutions. On a day-to-day basis, they are responsible for managing deposit accounts

and wealth, analyzing credit profiles, and providing guidance to business owners on loans and cash management services.

Why are they appropriate for the research study?

This study examined the impact of blockchain technology on the banking sector's shareholders. It involved top bankers and their support staff, who oversee and manage the economy's money supply. The researcher could conclude the broader population by analyzing data from the FRED and conducting interviews, ensuring high external validity. The study also used a straightforward random sample, allowing for quick and cost-effective completion of both tasks, providing insights into the entire population quickly and cheaply.

What is the size of the eligible population?

Only speeches and testimonies from the FOMC of the Federal Reserve will be eligible for inclusion in the sampling of this research. A Boolean string (blockchain* OR distributed*) AND (profit* OR revenue OR cost OR expense* OR "retained earnings*) run on the website https://www.federalreserve.gov/default.htm produced 2,128 speeches and testimonies. From this population, 49 were selected randomly. Additionally, the researcher collected primary data through interviews for the qualitative portion of the study. Saturation served as the basis for the qualitative sections, which included 15 interviews (Adler and Adler, 1998; Baker et al., 2012; Creswell, 2009). Mwita (2022) defined saturation as the point of diminishing returns or the point at which the data begins to repeat itself.

Discussion of Sampling

The participants were chosen using both non-random and probability sampling criteria because this is a mixed-method approach (Stratton, 2023). The researcher employed this strategy due to the difficulty of collecting data directly from banks because of their stringent regulations.

For instance, the Bank Secrecy Act of 1970 provides a framework for discouraging and identifying those who attempt to abuse the American financial system. Data collection is challenging since financial organizations are required by the Gramm-Leach-Bliley Act to secure client information. The qualitative sampling was chosen using the purposive sampling technique. This type of sampling, often called judgment sampling, involves selecting the most beneficial sample for the research's objectives (Stratton, 2023). The quantitative sampling method was stratified, splitting the population into subpopulations. This enables the researcher to obtain more precise results by ensuring that each subgroup is well-represented in the sample (Harris et al., 2021).

Discussion of Sample Frame

A sampling frame is the source material or device from which a sample is drawn. In other words, it is a list of all the people, families, or institutions within a population that can be sampled (Harris et al., 2021). The researcher could not obtain data from all target population segments due to limited resources and accessibility (Ghosh & Steorts, 2019). The researcher used the Boolean String tool to select the articles and testimonies for the quantitative portion of the study. For the qualitative portion, the researcher requested more interviews than was needed.

Sampling is a method that allows the researcher to infer information about a population based on results from a subset of the population without having to investigate every individual (Lu & Franklin, 2018). A sample size calculator was used for quantitative sampling, and the statistical test criterion of a 95% confidence level and a 5% confidence interval was reached. The FRED database was used for the sample. A word count tool was used to convert speeches and testimonials into data. For the qualitative portion, the researcher conducted interviews with 30 bankers.

For the quantitative portion of the study, the speeches and testimonies that were used contained "blockchain" or "distributed" and one or more of "profit," "revenue," "cost," "expense," or "retained earnings." Articles and testimonials that only had "distributed" or "blockchain" were also included. This approach was appropriate because it encompassed all the specified terms and was related to the topic, providing a good population sampling.

A research sample size was calculated when the study was proposed; excessively large and too small of a sample are needless and unethical. Statistical software was used to determine the required sample size based on assumptions. The computation determines the minimum number of users needed to generate a plausible forecast of population behavior based on a single study. The research needed 20-50 data points in a quantitative usability study to reasonably forecast the entire population's behavior (McLaughlin et al., 2019).

How the Sample Size Helps the Researcher Reach Saturation

In qualitative research, the selection of a smaller and more uniform sample size is of paramount importance. Rather than attempting to cover a broad spectrum of individuals, qualitative research focuses on dividing audiences into comparable psychographic features, known as personas (Anderson, 2019). This careful selection allows for thoroughly exploring topics and ideas within the chosen population. For instance, in the financial sector, a well-defined set of criteria was used to select bankers aligned with the study's objectives and topics (Boddy, 2016). Saturation in qualitative research, the point at which recurring themes cease to provide new insights, was reached when additional interviews with bankers failed to yield fresh perspectives (Lakens, 2022). This saturation resulted from a thorough analysis of a complex finance field with limited data availability.

Moreover, the study's specificity also significantly influenced the sample size. In essence, including more participants did not necessarily guarantee a more diverse range of opinions or data. A sample size of 15 was found to describe the phenomenon and answer the research question effectively. A larger sample size would have risked yielding redundant and repetitive data, underscoring the delicate balance needed in research design (Lakens, 2022).

How to Gain Access to The Sample

To implement the following parameters into a Boolean string, the researcher first entered the FOMC website, clicked on data at the top of the screen, and then put the search terms in the search box, separated by AND, OR, or by a minus sign (-) right in front of the term to be excluded from the results (a space should come before the minus character). The term was entered with quotation marks to be searched for. The researcher then tried to be as specific as possible for the most significant outcomes. For the qualitative portion of the research, the recommended number of bankers was 30.

Summary

The Fed can use blockchain as a financial instrument to assist banks in becoming more stable and to increase shareholders' net worth in the banking industry. Because they are the best bankers in the country and they oversee and control the money flow into the economy, they have been chosen as participants in this project. Therefore, the data for this study was gathered from their speeches and testimonies from the FRED database (Mendez-Carbajo, 2020). These bankers are the Federal Reserve Board members whose speeches and testimonies are collected and stored in the FRED database. These speeches and testimonies center on years of industry experience and technical knowledge. This study uses them to better understand blockchain has effect on

banking shareholders' net worth (Mendez-Carbajo, 2020). Finally, the bankers who work in the industry were used as a source of qualitative data for this study.

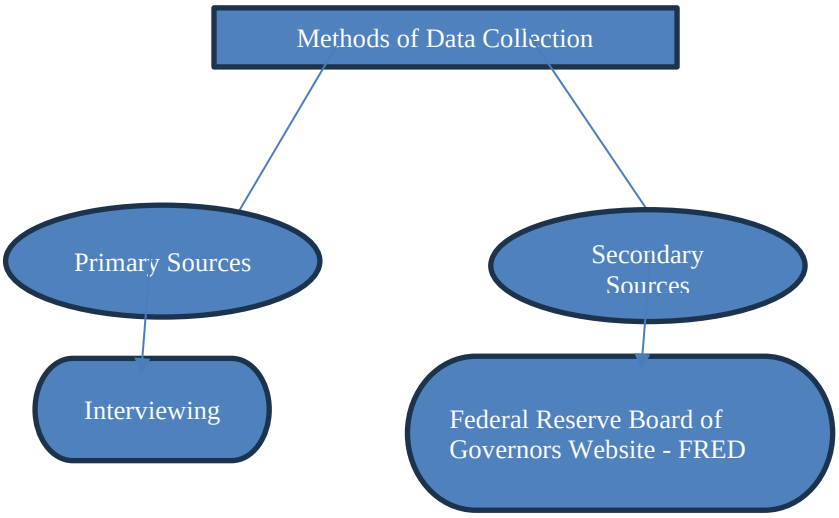
Chapter 4: Data Analysis and Results

Overview of the Study

The current chapter exhaustively analyzes, interprets, discusses, and presents the research findings. The research objectives were strictly followed during the data analysis phase, and the methods used are thoroughly discussed in the third chapter of this study. The researcher accomplished this by using both quantitative and qualitative data. The collection of qualitative data was obtained from semi-structured interviews with 15 bankers. Relevant secondary data was sourced from the Federal Reserve databases (FRED) to provide definitive and thorough information. Utilizing the mixed design method for this research was the best course of action to understand better the effect of blockchain technology on banks' shareholders' net worth. As a result, the more emergent nature of qualitative research and the rich insights into organizational mechanisms and processes found with the mixed research design yielded valuable results for determining the impact of blockchain on the banking industry. Furthermore, the study procedures of the mixed research design were directly in line with the study's objectives for developing alternate approaches to impact comprehension.

Data Analysis

Figure 2



Qualitative Data

The initial research phase involved a comprehensive review of the qualitative data, including multiple readings to grasp the context and content. Subsequently, the data was systematically segmented and labeled with codes to facilitate analysis. These codes served as descriptors for the data content. Identifying recurring patterns or overarching themes across the coded data was pivotal. These themes, representing significant concepts or recurrent ideas, were then meticulously reviewed to ensure accurate representation and distinctiveness. Further refinement explicitly defined each theme with descriptive names, contributing to a comprehensive understanding of their essence. The synthesis of findings entailed integrating and structuring the themes into a coherent narrative supported by data excerpts and a discussion of their implications. This systematic approach enabled the researcher to derive meaningful insights from the qualitative data.

Qualitative data was collected from four primary questions during virtual semi-structured interviews with 15 randomly selected bankers. Further discussion and more precise information

were gathered from follow-up questions based on the initial feedback of the interviewees. Microsoft Word was used to store data. Following an initial investigation, thematic analysis was employed to examine the qualitative data. The thematic research focused on participants' remarks to identify underlying content. This process involved identifying, analyzing, and reporting patterns (themes) within the data. Data collected from participants' comments on their experiences were also scrutinized for accuracy and categorized by recurring themes. Theoretical and empirical literature reviews were conducted to identify knowledge gaps or discrepancies with the findings of this investigation. Themes that did not impact blockchain technology and banks' shareholder value or add additional knowledge were excluded.

Emergent Ideas

The researcher began by thoroughly reading the interview notes to familiarize himself with the data while looking for patterns, themes, or interesting points. The researcher then noted thoughts, ideas, or insights that came to mind, including significant or interesting elements such as particular phrases used by participants, recurring themes, or contradictions. This process continued until all the data had been examined (Escobar, 2020). The researcher then compiled and summarized the initial observations and understanding of the data. Subsequently, the researcher analyzed the memos and looked for relationships, trends, and themes, allowing emergent concepts to take shape. This technique served as a crucial link between the collected data and the development of the theory.

Coding Themes

The researcher organized and made data understandable through coding, which involved identifying important or intriguing data points and assigning them a name or code. The researcher reviewed the data again, hunting for noteworthy or intriguing data points. Each of

these portions was then given a code—a single word or sometimes a phrase summarizing the segment's topic. The researcher continued reading and coding the notes until the data was thoroughly reviewed. A collection of codes was created to designate the noteworthy data. After reviewing these codes, the researcher classified them as themes. Each theme represented a significant notion or idea developed from the data. The researcher categorized and characterized the ideas, providing a thorough explanation of each theme and its relation to the research questions. This iterative process required switching back and forth between data and interpretations, necessitating close interaction with the data to open fresh perspectives.

Interpretations

The researcher followed specific steps to create and obtain interpretations. The first step was to observe the data collected from the interviews, closely scrutinizing it to develop an understanding. The next step was to understand the context. After creating the database from the interviews and saving the manuscript, the researcher attempted to comprehend the context by studying the data, dissecting it into themes, assessing how these parts interact, and understanding the overall structure. Observations, context knowledge, and research were combined to create a coherent interpretation (Whittaker, 2000). The final stage of interpretation involved evaluating the interpretation's correctness and dependability. The researcher accomplished this by assessing several interpretations and contrasting them with others. It was crucial to critically assess the interpretations of the findings, considering the source's reliability and supporting data.

Data Representation

Data visualization and representation were essential stages in data analysis because they made understanding complex data sets more straightforward. The researcher started by gathering the information that served as the study's primary focus from interviews with bankers. After the

data was gathered, it was stored in Microsoft Word and Excel databases. Identifying trends, outliers, or patterns in the data was necessary (Charli et al., 2022). The data was then presented in a way that could be easily understood. The researcher selected the best visualization based on the type of data and the question to be answered. The researcher used tables and figures with relevant labeling, including a title, labels for the axes or legends, and units of measurement. When the visualizations were finished, they made it easier to understand the findings.

Analysis for Triangulation

Triangulation is a robust research technique utilizing diverse methods or data sources to foster a comprehensive understanding of phenomena. This approach augments the credibility and validity of findings by corroborating information from varied perspectives. The researcher employed qualitative and quantitative methodologies to investigate a specific phenomenon (Creswell & Poth, 2018).

Qualitative data was obtained through interviews, while quantitative data was sourced from the Federal Reserve FRED Database. This comprehensive approach was undertaken to attain a more holistic understanding (Wagner, 2014). Analyzing the data through multiple lenses provided diverse insights. The qualitative component, comprising in-depth interviews, delved into the disruptive influence of blockchain technology on banking practices, while the quantitative aspect, drawn from the FRED Database, provided numerical evidence. Thematic analysis was adopted for the qualitative data, while statistical analysis was employed for the quantitative data. Subsequently, the findings from both methods were compared, enabling the identification of patterns, similarities, and differences. The integration of these findings yielded a comprehensive understanding, facilitating the formulation of robust conclusions. The overarching issue under scrutiny pertained to the disruptive influence of blockchain technology

on banking practices. By triangulating these methodologies, the researcher corroborated interview findings, thereby cultivating a more nuanced and reliable understanding of blockchain technology's impact on shareholders' net worth within the banking industry.

Summary

The study entailed a comprehensive examination of qualitative data involving data segmentation and labeling using codes, identifying recurring patterns and themes, establishing descriptive names, integrating themes into a coherent narrative, and extracting meaningful insights from the qualitative data. The qualitative data was gathered through semi-structured interviews with 15 bankers. Thematic analysis was employed to scrutinize the data, focusing on participants' statements to uncover underlying content. Emergent ideas were identified by meticulously reviewing the interview notes and observations. These initial observations were collated, summarized, and developed into emergent concepts. Coding themes involved organizing and comprehending the data by assigning a name or code to important or intriguing data points. The researcher categorized and characterized the ideas and assessed the accuracy and reliability of the interpretations.

Reliability and Validity

In the initial investigation, the qualitative data were examined using thematic analysis to ensure reliability and validity. The degree of accuracy reflected what they were supposed to represent, which validated the study. To encourage participants to communicate freely and be open-minded about questions, the researcher ensured that their privacy was protected throughout the process.

Reliability

The consistency and reproducibility of the research findings are referred to as a study's reliability. Reliability was maintained throughout the investigation, making the study legitimate

and reliable. The researcher ensured the study's integrity in the following ways. Confidence in the integrity of the findings was referred to as credibility. The idea of credibility was employed in qualitative research because the findings were from the viewpoint of the research participants (Aldiabat & Le Navenec, 2018). Confidence in the data's accuracy and interpretation was a top concern for the researcher. Thus, the data gathering accurately reflected the phenomena of blockchain technology and its impact on shareholder net worth. These data were interpreted in a way that accurately reflects the phenomenon. This was accomplished via various tactics, including member checking, sustained interaction, and steadfast surveillance (Aldiabat & Le Navenec, 2018). As a result, faith in the data's integrity and interpretations was a critical component of the credibility criterion. The researcher also considered the extent to which the data can be utilized in other contexts. A thorough explanation of the study setting, and the fundamental presumptions was given to achieve this. As a result, others can assess whether findings are transferrable by comparing their research's context and underlying assumptions with the topic. The researcher described the stability of the data through time as the dependability of the investigation. The researcher employed an audit trail, where the study process and decisions were meticulously documented to verify reliability. This enabled others to review the procedure and assess its suitability. The researcher assured confirmability when results can be independently verified or confirmed (Carcary, 2021). Reflexivity, a method the researcher employed to establish confirmability, entailed documenting the researcher's biases and effects. This made it possible for others to consider these while evaluating the findings.

Validity

A pilot study was conducted to evaluate the reliability and validity of the research tool. The outcomes were favorable. To enhance the overall quality of the research instrument, all

components found ineffective in measuring the research questions were removed or modified based on the preliminary testing results. Respondents were invited to review the pre-test interview questions with the researcher to ensure they were pertinent, understandable, and appropriate to the study's objectives. Before the instrument was utilized to gather data for the study, it underwent several necessary modifications. Additionally, the researcher used triangulation to boost the validity and reliability of the findings by employing various research techniques and sources. The researcher also compared and double-checked the results of these techniques and sources (Grabbe et al., 2022). The researcher considered saturation during the qualitative data collection when no new data or themes emerged. Achieving saturation helps ensure the validity of the research by guaranteeing that all possible perceptions, experiences, or hypotheses have been explored. Data was gathered until no new themes or information emerged, and saturation was determined by periodically evaluating the data. Implementing these techniques ensured that the findings accurately depicted the phenomenon.

Bracketing

The researcher utilized bracketing to mitigate the potential negative influences of assumptions on the research process (Carcary, 2021). The researcher approached the study differently by recognizing possible biases and setting them aside. The researcher engaged in self-reflection and documented biases before and during the research. This involved acknowledging any preconceptions or assumptions about the study topic, which were noted in the researcher's journal and research log. This process helped the researcher consciously strive to set these biases aside during the research and analysis. Peer debriefing was employed to gather feedback from colleagues or other researchers not directly involved in the study. This method helped identify and challenge the researcher's assumptions and biases, enhancing the study's thoroughness. The

invaluable insights and suggestions obtained through this peer debriefing process were crucial in refining interpretations and ensuring the study's conclusions were well-supported (Creswell & Poth, 2018). The use of bracketing techniques was essential in conducting rigorous and credible research.

Ethical Assurances

The researcher maintained privacy throughout the procedure to ensure participants freely communicated and were open-minded about questions. The questions were carefully constructed for the best outcome. The researcher educated the participants about the research study, providing all necessary information, including its purpose, duration, procedures, risks, benefits, and alternatives. It was important for participants to understand this information before signing the voluntary agreement. Interviewees were assured that the data collected would be used exclusively for scholarly research, ensuring that participants were not coerced or deceived into participating (Atkinson & Delamont, 2002). The researcher evaluated the potential risks and benefits of the study, considering psychological and social risks and tangible gains for participants or societal advantages from new information. The moral precept was that the benefits exceeded the disadvantages. Participants were chosen fairly and objectively to eliminate discrimination or biases, with selection not based on social, ethnic, sexual, or cultural characteristics. By following these protocols, the researcher upheld all ethical standards and safeguarded the rights and welfare of study participants.

Quantitative Data

Introduction

The quantitative data was comprehensively analyzed using descriptive and inferential statistical methods. Descriptive techniques included calculating frequencies and statistics such as

averages, variances, standard deviations, and ranges, with results presented in tables and charts. For inferential analysis, hypothesis testing was undertaken to ascertain any substantial correlations between the response and the explanatory factors. Various tests, including ANOVA: Single Factor, Tukey's Honest Significant Difference (HSD), Correlation Among Variables, The Regression Model, Variables Trendline, and Type I and II Errors, were utilized. Before conducting these tests, diagnostic procedures were implemented to validate the study outcomes. The data underwent meticulous collation with rigorous error elimination before analysis. Scrutiny of the data was performed to detect inaccuracies, with all inconsistencies, conflicting, and duplicated data diligently discarded. Systematic and thorough data preparation was carried out to clean, recode, and transform the data, thereby strengthening the validity and significance of the analytic process. Microsoft Excel served as the tool for data analysis, specifically assessing the correlation between blockchain technology and banking shareholder net worth. A correlation test was executed to determine the relationship between blockchain technology and shareholders' net worth, while distributional metrics such as the mean were computed to elucidate the data further.

Variables

Table 1

Variables

Variable	Variable Type	Data Type	Range
Income Statement (Operation)	Independent	Ratio Scale	1-96
Balance Sheet (Value)	Dependent	Ratio Scale	28-278
Suitable Products	Mitigating	Ratio Scale	1-411
Efficiency	Mitigating	Ratio Scale	14-147
Limitations	Mitigating	Ratio Scale	22-754
Time	Mitigating	Ratio Scale	5-297

Table 1 provides an overview of the variable type (independent, dependent, or mitigating), the data type (nominal), and the range. Relevant secondary sources from the Federal Reserve databases (FRED) provide definitive and thorough information. To meet the precise goals of the study, the quantitative data was coded, cleaned, analyzed, presented, and conclusions drawn. The data on each variable were analyzed using both descriptive and inferential statistics. Additionally, data was provided in frequency distribution tables to aid in the description and justification of the study's conclusions. The objectives of the inferential statistics were to ascertain the link between independent, moderating, and dependent factors and evaluate the hypothesis presented in the first chapter.

The quantitative data was meticulously entered into Excel, assigning categorical codes to different variables. It was imperative to conduct hypothesis tests to ascertain the significance of the findings. The results were effectively summarized in tables, charts, and narrative form, crucial for ensuring a transparent and logically structured presentation. This systematic analysis of the data was fundamentally essential for deriving meaningful conclusions. The quantitative data was processed after being cleaned. The data was sorted, normalized, or subjected to calculations. The unprocessed data was converted to a form that could be quickly analyzed. The researcher selected the best visualization format. Graphs and charts were relevant components, including a title, labels for the axes or legends, and units of measurement, which were included in the display. When the visualizations were finished, it made it easier to understand the findings. The data was then presented so the target audience could easily understand.

The researcher followed the steps listed to create and obtain interpretations. The first step was to observe data collected from the FRED database, closely scrutinizing the data to develop an understanding. The next step was to understand the context. After creating the database from

the selected articles and speeches and saving the manuscript, the researcher attempted to comprehend the context by studying the data. This involved dissecting it into components, assessing how these parts interact, and the overall structure. Observations, context knowledge, and research were combined to create a coherent interpretation (Whittaker, 2000). Evaluation was the last stage of interpretation. It entailed evaluating the interpretation's correctness and dependability. The researcher accomplished this by assessing several interpretations and by contrasting the interpretation with others. It was crucial to critically assess the interpretations of the findings, considering the source's reliability and supporting data.

Descriptive Statistics

Using descriptive statistics is crucial for summarizing and comprehending the fundamental characteristics of a dataset, providing concise summaries of the sample and its measures. The following presents a comprehensive overview of the standard descriptive statistics employed for assessing data quality, beginning with measures of central tendency. Understanding the mean (average), median, and mode enables the researcher to grasp the central tendency of the dataset. The mean, derived from the sum of all data points divided by their number, offers a central value for the dataset. In contrast, the median denotes the middle value when the data points are arranged in ascending or descending order, which helps understand skewed distributions' central tendency. Lastly, the mode, representing the most frequently occurring value in the dataset, proved especially useful for categorical data.

Subsequently, measures of dispersion were utilized to gauge the spread of the data. The range, determined by the difference between the maximum and minimum values, provides insight into the data's spread. Furthermore, the variance, calculated as the average of the squared differences from the mean, measures the extent to which data points deviate from the mean.

Complementing this, the standard deviation, as the square root of the variance, further aids in understanding the spread of the data.

Furthermore, understanding the measures of the shape of the distribution curve was imperative. Skewness was employed to gauge the asymmetry of the data distribution, where positive skewness indicated a longer tail on the right and negative skewness indicated a longer tail on the left. Additionally, kurtosis, essential for understanding the "tailedness" of the data distribution, indicated heavy tails with high kurtosis and light tails with low kurtosis while measuring the average distance from the mean. These descriptive statistics collectively offer a comprehensive overview of the dataset, facilitating the identification of patterns, trends, and potential issues such as outliers or missing values. They form the foundational basis for more advanced statistical analyses and data modeling.

The study underscored the importance of descriptive statistics in summarizing and understanding the fundamental characteristics of a dataset. It discusses measures of central tendency, such as mean, median, and mode, as well as measures of dispersion, including range, variance, and standard deviation. Additionally, the study highlighted the significance of understanding the measures of the shape of the distribution curve, such as skewness and kurtosis. These descriptive statistics helped identify patterns, trends, outliers, and missing values in a dataset, laying the groundwork for more advanced statistical analyses and data modeling.

Hypotheses

The following research questions outline a comprehensive analysis of blockchain technology's impact on the commercial banking sector. The hypotheses address various relationships between blockchain technology and critical variables within the banking industry. Each question focuses on specific aspects of blockchain technology and its potential effects. The

general hypothesis is whether blockchain technology affects banking shareholders' net worth. The research questions are as follows:

RQ1: Does blockchain technology positively affect cost reduction in commercial banking? Variables related to this question include the income statement, time, and balance sheet.

RQ2: Is there a relationship between the efficiency of blockchain technology and its impact on the banking industry? Variables related to this question encompass the income statement and appropriate financial products.

RQ3: To what extent is blockchain technology suitable across different domains within commercial banking? The variables associated with this question are the income statement and efficiency.

RQ4: What is the correlation between the implementation of blockchain technology and the net worth of banking shareholders? Variables pertinent to this question include limitations and efficiency.

RQ5: What cost savings can banks achieve by integrating blockchain technology into their lending processes? This question considers variables such as the income statement and suitable financial products.

For each hypothesis, a series of pre-test and post-hoc tests were conducted. The F critical value, also referred to as the F crit, serves as a benchmark in ANOVA (Analysis of Variance) tests to determine the significance of the observed F statistic. An integral part of the post-hoc analysis, Tukey's Honest Significant Difference (HSD) test played a crucial role in this study's statistical analysis by conducting pairwise comparisons of group means and identifying significant differences. To comprehend the relationships between dependent, independent, and moderating variables, a correlation chart was generated, presenting correlation coefficients to

quantify the linear associations between variables. Additionally, a regression model was utilized, and a Type I & II Error test was executed to complete the analysis.

To maintain the generalizability of the results, the researcher conducted group tests focusing on effectively managing or mitigating variables. Generalizability pertains to the applicability of study findings to broader populations beyond the specific study conditions. To achieve this, the researcher implemented strategies to mitigate variables in group testing.

Group Test

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In the realm of research, hypotheses and research questions play pivotal roles by guiding the direction and focus of a study. Research questions establish broad inquiries that the study

aims to address, setting the foundation for the investigation and delineating the researcher's areas of interest. Meanwhile, hypotheses provide specific, testable predictions derived from the research questions, explicitly stating the anticipated findings based on existing theory or prior research. To summarize, research questions guide overarching inquiry, while hypotheses furnish precise predictions that can be examined. The outcomes then validate or disprove these hypotheses, ultimately contributing to the comprehension of the research questions.

The selection of blockchain and banking as the focal subjects for this study holds considerable significance. The blockchain chosen for this study is consequential as it revolutionizes the financial sector. By offering a decentralized, secure, and transparent framework for transactions, this blockchain technology holds the potential to substantially mitigate fraudulent activities, enhance operational efficiency, and reduce costs. Given the central role of banks in the global economy, comprehending the potential impact of blockchain on banking practices, customer experience, and regulatory adherence becomes imperative. Notably, blockchain stands as one of the most extensively deliberated technologies in the financial domain, and an investigation into its application in banking holds the promise of yielding valuable insights into forthcoming trends and innovations. Unraveling the prospective influence of blockchain on banking is crucial for anticipating shifts in financial services, regulatory environments, and economic paradigms. The potential impact of blockchain on banking is significant, and your research could play a key role in understanding and shaping this impact. Numerous banks are exploring blockchain for diverse applications ranging from cross-border payments to smart contracts and identity verification.

Relevancy of Hypotheses

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Numerous banks are exploring blockchain for diverse applications ranging from cross-border payments to smart contracts and identity verification.

The versatility of blockchain in banking, encompassing enhancements in transaction speed and security, positions it as a representative subject for analyzing technological advancements in finance. There remains much to be comprehended regarding the complete potential and constraints of blockchain in the banking sector, and your research holds the potential to bridge these knowledge gaps and advance the field. Considering the transformative potential of blockchain, the findings from this study could have far-reaching implications on banking operations and the delivery of financial services in the future. The decision to investigate blockchain and banking is strategic, aligning with current technological trends, delivering practical benefits, and offering fertile ground for academic exploration. This theoretical research has practical implications for the banking sector, offering insights that can be directly applied to improve operations and services. This decision allows the researcher to address pertinent research questions, contribute to an evolving knowledge base, and gain a competitive edge in the employment market.

Summary

This section provides a comprehensive overview of descriptive statistics and their importance in summarizing and understanding the characteristics of a dataset. It discusses measures of central tendency, such as mean, median, and mode, as well as measures of dispersion, including range, variance, and standard deviation. It also highlights the significance of understanding the measures of the shape of the distribution curve, such as skewness and kurtosis. Additionally, it outlines research questions focusing on the impact of blockchain technology on the commercial banking sector, along with hypotheses addressing various

relationships between blockchain technology and critical variables within the banking industry. It outlines the use of ANOVA tests, Tukey's Honest Significant Difference (HSD) test, correlation charts, regression models, and Type I & II Error tests for statistical analysis.

Reliability and Validity

A reliability plan for quantitative data constitutes a methodical approach to ascertain the consistency, stability, and replicability of the data collected in a study. Reliability is paramount in research, as it determines the degree to which results can be relied upon and extrapolated. Precise definitions of constructs and variables ensure precision and eliminate ambiguity in operational definitions. The reliability of the data source was guaranteed, and the researcher's subjective judgments, guided by these steps, played a crucial role in ensuring the reliability of the quantitative data, consequently bolstering the validity and credibility of the research findings.

Ethical Assurances

Establishing an ethical assurance plan in quantitative research devoid of human subjects is not merely essential but indispensable. Even without human participants, ethical considerations remain paramount and necessitate careful attention. The researcher diligently upheld the integrity and precision of all utilized data by rigorously validating sources and methodologies. All data has been anonymized and securely stored to safeguard privacy. Proper attributions were employed to recognize sources, and permissions were duly acquired for proprietary data. The researcher endeavored to preclude bias and present findings candidly, forthrightly divulging any conflicts of interest. The study adhered to all pertinent regulations and assessed its broader social and environmental ramifications.

Summary

This section outlines a reliability and validity plan for a research study. It emphasizes the importance of precision in representing intended parameters and ensuring credibility. The reliability plan focuses on establishing the consistency, stability, and replicability of the collected quantitative data. A clear definition of constructs and variables, along with the use of multiple questions for each construct, contributes to enhancing reliability. Adherence to these steps bolsters the validity and credibility of the research findings.

Qualitative Findings

Introduction

Fifteen participants were interviewed virtually for this study. Several themes emerged while analyzing the data gathered from the interviews. These themes included income statements (operation), balance sheets (value), suitable products, efficiency, limitations, and time. The income statement represents profitability, and the balance sheet represents value. The other three represent the items that influence financial value positively or negatively.

Themes Discovered

There were four primary questions in the semi-structured interviews. Further discussion and more precise information were possible for each primary question. These interview questions enhanced the research questions in this study. Virtual interviews were performed. The emerging theme data was stored in Microsoft Word during the open coding procedure. The emerging themes from the initial coding phase were:

- **Theme One: Operation –** data associated with the income statement.
- **Theme Two: Value –** data associated with the balance sheet.

- **Theme Three: Suitable Products –** data associated with the various blockchain technology products.
- **Theme Four: Time** – data that is associated with the future.
- **Theme Five: Efficiency –** data that is associated with efficiency.
- **Theme Six: Limitation –** data associated with barriers to implementing blockchain in the banking industry.

Interpretation of the data

Income Statement (Operation) Theme

This theme is consistent with Dogru et al. (2019) statement on P42 that blockchain can displace existing banking activities established on traditional databases with the potential for cost-saving and efficiency improvement. The associated costs and the opportunity to establish new revenue streams are vital considerations when integrating new technologies. A blockchain infrastructure's initial establishment and maintenance may involve higher expenditures than traditional systems. However, these costs are projected to decrease as blockchain technology advances and opens new revenue streams for the banking sector. Understanding the interplay between net income retained earnings and shareholders' net worth is essential when incorporating blockchain technology into banking operations. Net income represents a company's profit after subtracting all expenses, including taxes, from its total revenue. Retained earnings, conversely, denote the accumulated net income that a company has preserved rather than disbursing to shareholders in the form of dividends. Notably, retained earnings constitute a substantial portion of shareholders' equity. An increase in net income typically results in a corresponding rise in retained earnings, bolstering shareholders' net worth and fortifying the entity's financial soundness. Correspondingly, an augmentation in retained earnings precipitates

an increase in shareholders' equity. Therefore, when integrating new technologies, cost control, and increased revenue are critical considerations because maintaining profitability is directly tied to the financial health and stability of the banking industry.

In the interview, Participant Two underscored that blockchain technology can substantially reduce bank transaction costs, potentially resulting in cost savings and enhanced processing speed and operational efficiency. Banks can leverage smart contracts to streamline interactions with counterparties and reduce reliance on intermediaries. Blockchain automated contracts represent a significant advancement for the banking sector. They lead to reduced operational costs and minimize errors, enabling banks to establish a more competitive pricing structure while ensuring sustained profitability. Additionally, Participant Four asserted that financial institutions embracing blockchain technology could realize considerable savings in infrastructure expenditures, positioning cost as a pivotal factor in fostering broader adoption of blockchain within the financial sector. As a result, banks were able to minimize costs by being the first to establish global blockchain infrastructure. Furthermore, Participant Fifteen highlighted the capacity of blockchain technology to curtail costs in securities trading and cross-border payments by eliminating intermediaries and abbreviating clearing and settlement durations. These cost efficiencies can contribute to heightened retained earnings, underscoring the advantages of embracing blockchain technology. Lastly, Participant Eight noted that blockchain technology curtails processing and operational expenses, eliminates intermediaries, and enhances processing speed and efficiency, thus bolstering the overall potential for cost reduction and improved operational effectiveness through its adoption.

Banks are presented with a plethora of innovative revenue streams through blockchain technology. Participant Thirteen highlighted that blockchain technology allows banks to

establish new revenue streams, such as offering BaaS to other businesses or developing new financial products based on blockchain technology. This optimistic outlook on blockchain technology allows banks to enhance the efficiency, security, and transparency of various financial services, thereby creating new avenues for revenue generation. Participant Seven indicated that these additional revenue channels have the potential to strengthen retained earnings and assets, making the adoption of blockchain technology a promising prospect for banks. Participant Fifteen stated that

> blockchain technology offers banks various opportunities to diversify their revenue streams and gain a competitive edge. Banks can leverage blockchain for cross-border payments, trade finance, tokenization of assets, smart contracts, identity verification services, custody services for digital assets, decentralized finance, consulting services, compliance solutions, and monetizing anonymized customer data. These opportunities can enhance profitability and foster innovation in the digital financial landscape.

Leveraging these capabilities enables banks to offer innovative products and services that cater to their clients' evolving needs.

The analysis examines blockchain technology and its implications for a bank's income statement. Blockchain technology presents banks with an abundance of innovative revenue sources. It provides insights into the initial costs of implementing blockchain and the projected long-term cost savings. Additionally, it delves into the advantages of leveraging blockchain technology within financial institutions, including reducing transaction expenses, savings in infrastructure outlays, and the potential for generating new revenue streams. Finally, it summarizes the prospective benefits of cost reduction and operational efficiency offered by blockchain technology within the financial sector. Banks derive substantial advantages from utilizing

blockchain technology. These benefits encompass increased resilience, enhanced security, improved operational efficiency, and heightened levels of customer satisfaction. Blockchain technology's emergence can potentially transform the financial services industry's current business structures completely.

Balance Sheet Themes (Value)

Cucari et al. (2022) agree that banks must choose to innovate through blockchain implementation from P59. Blockchain technology in the banking sector offers enhanced liquidity by providing transparency, faster settlement times, and tokenization of assets. It also facilitates smart contracts, decentralized finance, reduced transaction fees, and real-time monitoring for better risk management. Leveraging blockchain technology can lead to improved liquidity, more efficient processes, and greater transparency in banking.

Participant Nine emphasized that blockchain, functioning as a decentralized ledger, not only enhances transparency by publicizing all transactions to network members but also provides robust security features. Therefore, transparency and security features are inherently built into blockchain. Participant Fourteen highlighted the protection of transactions through sophisticated cryptographic algorithms and the consequent difficulty for unauthorized parties to alter records. Therefore, blockchain technology offers transaction security and transparency by integrating cryptographic hashing, sequential linking, immutability, distributed ledgers, consensus procedures, and public accessibility. Moreover, both participants underscored the advantages of blockchain's security and transparency for auditors, enabling efficient verification of transactions related to retained earnings, thereby reducing audit time and costs.

Participant Two articulated the potential for blockchain technology to revolutionize financial services, suggesting a possible increase in bank earnings due to customer

encouragement to use banking services for international transactions. This highlighted how blockchain is having a transformative effect on financial services. Participant Ten proposed that banks could actively leverage blockchain-based payments and clearing systems to issue stablecoins or digital currencies, thereby establishing new revenue streams. The introduction of the concept of tokenization by Participant Fifteen, which allows asset splitting into tokens for purchase and trade on blockchain platforms, and the significant cost-saving and efficiency-boosting potential of blockchain in the settlement process highlighted by Participant Three further underscore the potential benefits of blockchain in the financial industry. In conclusion, this stressed the transformative potential of blockchain technology in the financial industry.

Furthermore, the participants expressed how using smart contracts, autonomous arrangements with conditions explicitly inscribed in code, could streamline commercial lending practices. This application of blockchain technology could significantly improve the efficiency of lending processes. Participant Fourteen also proposed using blockchain to establish decentralized autonomous organizations (DAOs) independent of central authority as a means for banks to enhance shareholder value. This innovative use of blockchain could reshape the governance structure of financial institutions. This recaps the innovative use of blockchain technology in commercial lending and emphasizes the potential to reshape the governance structure of financial institutions.

This theme discussed the transformative potential of blockchain technology in the banking sector balance sheet. It focused on how blockchain implementation can amplify liquidity, enhancing transparency, expediting settlement times, and asset tokenization. Participant Nine underscored its role as a decentralized ledger and its ability to secure transactions through cryptographic algorithms. The discussion also highlighted the benefits of

blockchain's security and transparency for auditors. Participants Two and Ten emphasized the potential for blockchain to revolutionize financial services and suggested implementing blockchain-based payment systems in the banking industry. Additionally, the concept of tokenization, introduced by Participant Fifteen, was explored, along with the potential cost-saving and efficiency improvements in the settlement process through blockchain, as highlighted by Participant Three. Furthermore, the application of blockchain in optimizing commercial lending practices through smart contracts and the proposed use of blockchain in establishing decentralized autonomous organizations (DAOs) by Participant Fourteen were deliberated. In conclusion, the study summarized the potential advantages of blockchain in the financial industry, emphasizing the diverse opportunities and benefits discussed throughout the analysis. This analysis concludes that banking institutions must elect to innovate through blockchain implementation. As outlined, blockchain technology in the banking sector offers enhanced liquidity by providing transparency, faster settlement times, and tokenization of assets.

Suitable Products Theme

This theme aligns with Dogru et al. (2019), who noted on P42 that banks can establish new services in addition to business operations based on blockchains. Blockchain can provide substantial foundations for novel services. Blockchains are anticipated to become the base for new services and applications. The researcher also asked each of the fifteen participants about their thoughts on this issue. Participant Five stated that the banking sector would adopt the blockchain system in transferring assets between two parties located in various parts of the world. This is an opportunity for banks to investigate blockchain technology to increase supply chain finance efficiency and transparency. According to Participant Seven, banks have already begun implementing digital payment processing systems and other supply chain technologies.

Based on the data, payment and digital currency will play a significant role in the financial sector's adoption of blockchain technology. Blockchain technology can streamline the presently costly and time-consuming cross-border payment procedure. It can potentially draw clients to banking services for overseas transactions, boosting bank profits. Per Participant Five, banks understand the need to embrace blockchain technology to remain competitive and be well-positioned to leverage blockchain technology to evolve and maintain relevance. This potential for banks to remain competitive should motivate the industry to explore the benefits of blockchain technology.

Participant Nine stated that payments and clearing systems created on blockchain will allow banks to issue digital currencies or stablecoins, providing new revenue streams. This is a way for banks to remain competitive and fulfill the changing needs of their clientele. Participant Six stated that tokenization will enable banks to divide assets into tokens that can be bought and sold on blockchain platforms. The purpose of these tokens is to lessen volatility and offer a dependable medium of trade. Participant Fifteen stated that blockchain can simplify the settlement process, reducing costs and risks. This can improve banks' efficiency and profitability, potentially benefiting shareholders. Participant Two stated that it would allow for smart contracts, which are self-executing contracts with the terms of the agreement directly written in the code for commercial lending agreements.

According to Participant Fourteen, banks can use blockchain technology to establish Decentralized Autonomous Organizations (DAOs) that can operate independently of a central authority. Participant Three also stated that banks can utilize blockchain technology to create decentralized autonomous organizations (DAOs), which can function without central authority. This could help banks and their clients by producing more inventive financial goods and

services. Per Participant Two, blockchain technology can streamline the costly and time-consuming cross-border payment procedure. This has the potential to draw clients to banking services for overseas transactions, hence boosting bank profits. Participant Ten stated that payments and Clearing systems created on blockchain will allow banks to issue digital currencies or stablecoins, providing new revenue streams. This can simplify banking procedures to cut down on intermediaries and speed up transactions. Participants stated that tokenization will enable banks to divide assets into tokens that can be bought and sold on blockchain platforms (P101, P102 & P103). Participant Three stated that blockchain can simplify the settlement process, reducing costs and risks. This can improve banks' efficiency and profitability, potentially benefiting shareholders. Participants stated that it would allow for smart contracts, self-executing contracts with the agreement terms directly written in the code for commercial lending agreements (P108, P116, P125 & P132). Based on the data provided, banks' adoption of this technology has the potential to generate new revenue streams and markets, hence augmenting shareholder value.

Participant Thirteen stated that,

> The active involvement of financial institutions like JPMorgan Chase and Goldman Sachs in blockchain technology underscores the industry's commitment to innovation. For instance, JPMorgan Chase's development of platforms like Quorum and Goldman Sachs' investments in blockchain startups clearly indicates the promising future of blockchain technology in the financial industry. This context is crucial for understanding the significance of the research findings on the potential impact of blockchain technology on the banking sector.

This demonstrates the industry's commitment to innovation and provides reassurance about the future of blockchain in banking, making the research more convincing.

This theme addressed the importance of blockchain in the banking sector. It delves into the banking industry participants' perspectives on blockchain, including its impact on asset transfer, digital payment processing systems, and supply chain technologies. Additionally, it analyzed the data on payment and digital currency's role in blockchain adoption. Furthermore, it explored the benefits of blockchain technology in banking, such as streamlining cross-border payments, attracting clients for overseas transactions, and its competitive advantages and relevance. In addition, it discussed revenue streams and tokenization, including issuing digital currencies and stablecoins, tokenization for asset division and trading, and simplifying settlement processes and efficiency improvement. It also delves into smart contracts and decentralized autonomous organizations (DAOs), focusing on self-executing contracts for commercial lending agreements and establishing decentralized autonomous organizations.

Furthermore, it analyzed the industry's commitment to blockchain innovation, including JPMorgan Chase and platforms like Quorum, Goldman Sachs' investments in blockchain startups, and the reassurance about the future of blockchain in banking. Finally, it concludes by recapping the potential impact of blockchain in the banking sector and discussing the significance of the industry's commitment to blockchain innovation. In addition to conducting business activities on blockchains, banks will have the chance to launch new services, and blockchain technology can offer solid foundations for innovative services.

Time Theme

This theme is consistent with Rajnak and Puschmann's (2020; 2021) statement on P59 that blockchain technology is predicted to reshape existing business models in the financial

services industry. Views from Participant Fifteen shed light on the potential impact of blockchain on the banking industry; he stated,

> The involvement of stakeholders in the banking sector, particularly the central bank, and the evolving dynamics of the customer base, primarily the tech-savvy younger generation has sparked. significant interest in the incorporation of blockchain technology in banking operations.

This indicates that the banking industry will adopt financial technology (Fintech) and integrate blockchain technology into its operations to cater to these millennials.

Participant Six believes that blockchain technology has the potential to revolutionize the banking sector, with particular emphasis on its influence on customer behavior, capital needs, earnings, and overall industry disruption. There is optimism about the diverse benefits of adopting blockchain technology, ranging from reducing transaction processing costs and improving payment processing to enhanced efficiency, lower risk, and increased profitability.

However, Participant Three underscores the necessity for stringent prerequisites before the widespread adoption of blockchain in banking. This is not just a suggestion but a clear indication of the disruptive nature of blockchain in the banking industry. Participant Fifteen believes establishing robust infrastructure, managing global networks, meeting specific requirements, and adopting large-scale solutions should be a critical consideration. This forms the basis for applying blockchain technology in the financial sector. Additionally, Participant Seven understands the significance of interoperability among blockchains, highlighting it as a game-changer, facilitating cooperation, innovation, and increased efficiency within the blockchain community.

In conclusion, Participant Fifteen acknowledged the potential of blockchain to transform banking operations; he stated that it is evident that the successful integration of this technology is contingent upon meeting various prerequisites and ensuring seamless interoperability among different blockchain networks. The prevailing sentiment is cautious optimism, underlining the need for strategic planning, investment, and foresight in navigating the potential impact of blockchain on the future of banking.

The potential impact of blockchain on the banking sector is not just a possibility but a clear and promising future. The consensus among participants regarding its revolutionary potential is a beacon of hope. Emphasis has been placed on its influence on customer behavior, capital needs, earnings, and overall industry disruption. Blockchain technology offers diverse benefits, including reduced transaction costs, improved payment processing, enhanced efficiency, lower risk, and increased profitability. However, the widespread adoption of blockchain in banking requires critical considerations such as establishing robust infrastructure, global network management, meeting specific requirements, and large-scale adoption. The significance of interoperability among blockchains has been highlighted, as it facilitates cooperation, innovation, and increased efficiency within the blockchain community. Overall, while there is acknowledgment of blockchain's potential to transform banking operations, the prevailing sentiment remains cautious optimism, emphasizing the need for strategic planning, investment, and foresight in navigating the potential impact of blockchain on the future of banking.

Efficiency Theme

According to Rajnak and Puschmann (2020) from P59, blockchain technology can revolutionize banking by introducing new business models that challenge the existing status quo. One of the critical advantages of blockchain, as noted by Participant Seven, is its ability to operate on a decentralized network, eliminating the need for intermediaries or central authorities. This intrinsic feature enhances trust, reduces audit and dispute resolution time, and increases transparency, as every transaction is accessible to all parties.

The consensus mechanism, where a network of computers or nodes validates transactions, expedites processes and reduces costs. Furthermore, integrating cutting-edge cryptographic algorithms into blockchain technology enhances security, effectively mitigating fraud and criminal activities. Smart contracts, which encode the terms of an agreement into code and execute automatically, synergize with blockchain technology to optimize efficiency, as mentioned by Participant Four.

As Participants Seven and Six emphasized, blockchain technology streamlines banking processes. It accelerates transaction times and paperwork, benefiting peer-to-peer transactions while providing an immutable record of product movements in supply chain management. Rapidly detecting issues and reduced tracking time contribute to operational efficiency and risk mitigation.

The distributed ledger system inherent in blockchain technology ensures exceptional transparency and data accessibility to all stakeholders, as noted by Participant Eight. Furthermore, utilizing cutting-edge cryptographic algorithms safeguards shareholder data, ultimately protecting their net worth from fraudulent activities, as Participants Eleven and Three mentioned. Automating banking procedures through blockchain technology reduces reliance on

intermediaries. It significantly enhances operational efficiency, potentially leading to informed investment decisions in real-time, as articulated by Participants Five and Thirteen.

In summary, blockchain technology offers remarkable advantages in banking, including increased transparency, automated processes, enhanced security, and efficiency gains. Its potential to transform traditional banking systems by promoting trust and security, streamlining processes, and providing real-time transaction updates makes it a compelling prospect for the industry's future.

This theme provides an overview of blockchain technology and its significance in banking and business models. It delves into the advantages of decentralization, the role of computer networks in validating transactions, and the enhanced trust resulting from reduced audit and dispute resolution timelines. Furthermore, it examines the utilization of cryptographic algorithms to address fraud and criminal activity issues, defines smart contracts, and explores their benefits. Moreover, it emphasizes the secure and immutable recording of product movement within the supply chain. Additionally, it addresses eliminating intermediaries, reducing fraud risks, transparency, and data accessibility for stakeholders, along with the assurance of protected data through cutting-edge cryptography. Finally, it outlined the substantial impacts and potential efficiency of using blockchain applications in the banking industry.

Limitation Theme

Based on Casey's 2018 statement on P43, financial business practices may encounter several challenges when introducing blockchain technology. The level of excitement affiliated with blockchain as an innovative form. During the interview, fifteen participants shared their insights on this matter. Participant Seven highlighted the limited processing speed of blockchain technology. This poses a significant challenge for institutions handling high volumes of

transactions. Participant Six expressed concern about the transparency of blockchain transactions, which may conflict with the need to safeguard customer financial information. This is a fundamental aspect of banking. Additionally, regulatory uncertainties related to blockchain technology could lead to legal and compliance complications for banks.

Participant Fifteen emphasized the potential difficulty and cost of integrating blockchain technology with existing financial infrastructure. Furthermore, concerns were raised about the volatility of digital currencies and the high energy consumption of blockchain technology. Participant Seven stressed the importance of privacy and the need to protect customers' financial data, hinting that transparency in blockchain transactions might pose challenges. These limitations were perceived to significantly impact the adoption of blockchain technology in the financial sector. Another issue identified was the need for a precise legal framework for smart contracts, which may impact earnings and shareholder value. Participant Three pointed out that restrictions on blockchain technology could affect shareholder wealth and expose them to risks.

Furthermore, concerns were raised about the security of blockchain technology, as it is only partially immune to attacks. A compromise in the security of blockchain systems could lead to substantial financial losses for financial organizations, undermining the trust-based foundation of the economic system. Participant Thirteen recognized scalability as an obstacle, as blockchain technology’s ability to handle large transaction volumes is limited, potentially impeding the efficiency of banking operations. The need for a defined regulatory framework for adopting blockchain technology in financial firms was emphasized as an essential step.

The participants above highlighted the disparities between traditional centralized and decentralized blockchain systems, underscoring the potential challenges in communication and coordination between the two (P110). Finally, the issues of scalability, high costs, sluggish

transaction times, and regulatory uncertainty were reiterated as the primary challenges facing the integration of blockchain technology in the banking industry.

Integrating blockchain technology into financial business practices brings significant challenges, including processing speed, transaction volume, transparency, privacy, integration, legal framework, smart contracts, security, trust, and regulatory and communication challenges. These obstacles impact scalability, cost, transaction times, and regulatory uncertainty, potentially hindering the adoption of blockchain technology in the banking industry.

Representation and Visualization of the Data

An overview of the interviewees is given in Table 2. The blockchain experience in banking is diverse and encompasses numerous areas within the banking organization. Commercial banking, private banking, corporate risk, finance, asset management, and investment banking are among the segments. "commercial banking" describes banking services such as deposit-taking, business lending, and providing necessary investment goods. The primary drivers of income for commercial banks are loans and interest. High-net-worth individuals can access services through private banking. Personalized banking and financial services, such as wealth management, estate planning, and tax counseling, are provided by private banking. Corporate risk management addresses the possibility of financial loss or uncertainty about business operations. It can originate from several sources, such as poor strategic management choices, mishaps, natural calamities, or unstable economic conditions. The finance division oversees operations related to banking, credit, leverage or debt, capital markets, money, and investments. It stands for handling money and how it is invested or used to support the expansion of a company. The asset management division is responsible for the systematic development, use, upkeep, upgrading, and efficient disposal of assets. This section manages investment funds

and customer portfolios. Investment banking is the division that oversees raising capital for other businesses, governments, and organizations. Investment banks help with the underwriting of new debt and equity securities, the selling of securities, and facilitating reorganizations, mergers, and acquisitions, as well as broker trades for institutions and individual investors. Lastly, it provides the time each participant worked in banking and the bank's size in billions.

Table 2

Participants Demographics			
Participant Number	**Job Title**	**Years in Banking**	**Bank Size (billions)**
Participant 1	Sr. Commerical Underwriter	25	<$100
Participant 2	CEO, Asset Management	11	<$100
Participant 3	VP, Credit Underwriting Officer	11	<$100
Participant 4	Managing Director, Head of Operations & Finance	17	>$100 but < $1,000
Participant 5	Senior Director -Global Client Partner	23	>$1,000
Participant 6	SVP, Credit Risk Review Manager	10	<$100
Participant 7	CTO, EVP	19	<$100
Participant 8	Senior Vice President	18	<100
Participant 9	VP, Fixed income Trader	23	<$100
Participant 10	VP, Commercial Underwriting Manager	25	>$1,000
Participant 11	VP, Principal Relationship Manager	25	>$100 but < $1,000
Participant 12	SVP, Private Banking Advisor	13	>$100 but < $1,000
Participant 13	Digital Transformation and Technology Leader	12	<$100
Participant 14	Risk Management - Credit Risk Vice President	15	>$100 but < $1,000
Participant 15	Manager, IT Solutions	17	>$1,000

Figure 3

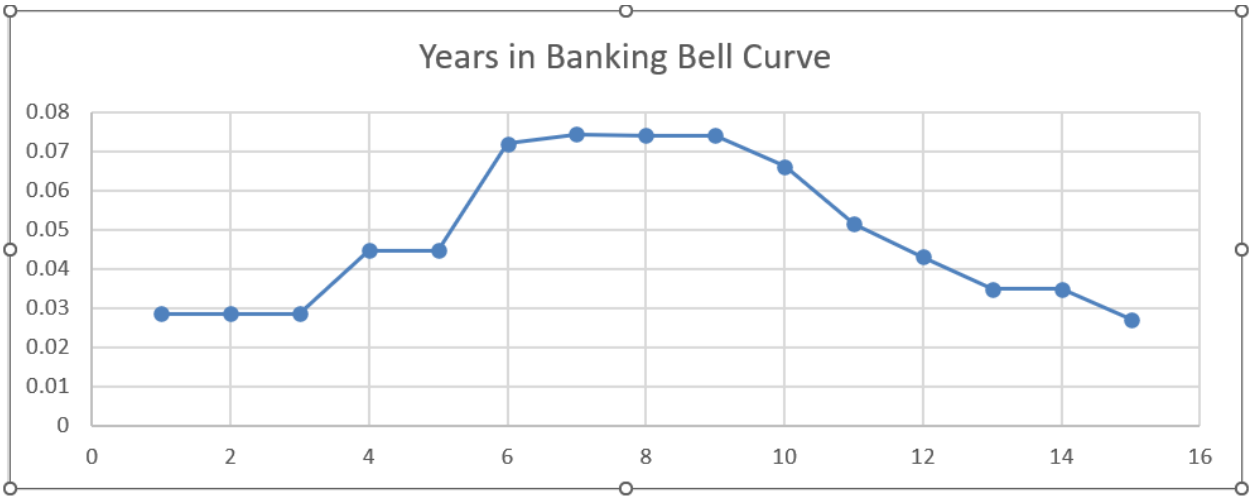


Figure 3 represents the frequency distribution of years in banking, a naturally normal distribution, sometimes called a bell-shaped curve (Newburger et al., 2023). A bell-shaped curve formed by the standard deviations from the mean of a normal probability distribution is called a bell curve. Conversely, the mean is the average of all the data points in the collection and is located at the highest point on the bell curve. Standard deviation is a measurement that aids in quantifying the variability of data dispersion. The normal distribution, or bell curve, describes a particular kind of probability distribution for a symmetric variable about the mean. It demonstrates that information near the mean occurs more frequently than information distant from the mean.

Table 3

Sample Theme Discovered Based on Interview Questions Related to Literature.

Theme Discovered	Relevant Interview Question	Relationship to Literature	Participant Quote
Time	Do you agree that banking managers are focusing more resources on blockchain activities now than they did five years ago? Why or why not?	Blockchain technology is predicted to reshape existing business models in the financial services industry (Rajnak & Puschmann, 2020; 2021).	Yes, it is widely acknowledged that bank managers are allocating more resources to blockchain initiatives now than five years ago (Participant Eight).
Income statement (Cost)	Do you agree that blockchain has helped decrease banking industry expenses? Why or why not?	As a result of the cost-saving and efficiency improvement potential, blockchain has the potential to displace existing banking activities established on traditional databases (Dogru et al., 2019).	Participant Five stated that cost is always the primary concern when implementing any new technology, and blockchain deployment is no different. The initial and ongoing expenses of setting up and running a blockchain infrastructure could be higher than those of more conventional systems. However, as technology develops, these expenses are expected to decrease eventually.
Balance Sheet (Value)	Do you agree that banking shareholders engage with blockchain strategy because it adds value? Why or why not?	Banks must choose to innovate through blockchain. Implementation (Cucari et al., 2022)	Participant Fifteen stated that global regulators are pushing banks to investigate the application of blockchain technology as they become more aware of its potential.
Products	Do you agree that stablecoin will disrupt the banking industry? Why or why not?	Banks will have the opportunity to establish new services and business operations based on blockchains. Blockchain can provide substantial foundations for novel services (Dogru et al., 2019). It is anticipated that blockchains may become the base for new services and applications.	Participant Fourteen stated that the growing popularity of digital assets and cryptocurrencies has increased consumer demand for blockchain-based services.
Efficiency	Do you agree that the banking industry understands the financial relevance of blockchain? Why or why not?	Furthermore, blockchain might lead to new business models in banking and thus challenge the status quo (Rajnak & Puschmann, (2020). Although blockchain is expected to provide several specific features like efficiency….	Participant Three stated that blockchain technology can streamline and automate complicated and time-consuming traditional financial procedures. This can result in significant cost reductions in international payments and securities trading. Participant Nine stated that blockchain is extremely transparent and secure because it is decentralized and immutable. This can enhance record accuracy and help banks reduce fraud.

Limitations	Do you agree that the banking industry faces barriers to more significant investment in blockchain technology? Why or why not?	Financial business practices may encounter several challenges with the introduction of blockchain technology. The level of excitement affiliated with blockchain as an innovative form (Casey, 2018).	Significant obstacles remain, such as a lack of standards, legislative ambiguity, and privacy and security issues (Participant Two).

Summary

Given the collective analysis of the themes above, it is evident that blockchain presents the potential to deliver substantial value to stakeholders. However, it is essential to acknowledge that the associated risks may overshadow the potential gains. The expense and difficulty of integrating blockchain technology with current banking systems may cause banks' net income to decline, impacting their retained earnings. The inherent volatility of digital currencies could result in notable variations in value if banks were to utilize them. Blockchain technology's high energy consumption may raise banks' operating expenses, lowering their net income and retained earnings. Due to its numerous constraints, the banking industry may need help to apply blockchain technology.

Relationship of the Results

Relationship to the Research Questions

The subsequent section examines further the associations outlined in the data representation and visualization sections. First, the study was guided by the connection between the research questions and the findings. The connection between the results and the conceptual framework was then investigated. Anticipated themes from the data were formulated throughout this study's preparation, considering the research objectives and conceptual framework. These expected themes were identified before assessing their significance for the study's conclusions. The study next investigated how the results related to the body of literature. The study's final analysis demonstrated the connection between the problem description and the findings.

RQ1) How can blockchain technologies minimize cost over time in commercial banking?

The first interview question was designed to illustrate the relationship between blockchain technology and cost. Different answers were given to this question depending on the participant's connection to the banking sector. All the participants indicated that cost is an essential factor in implementing blockchain technology in the banking industry (P98, P99, P101 & P104). The result indicated that cost will be high initially but will most likely abate over time. This would hurt shareholder net worth in the early stage of implementing blockchain technology. This is because as costs increase, net profit will tend to decrease, sinking shareholders' net worth.

As outlined in the background in chapter one, there is little doubt that finance and banking will follow wherever technology advances, so the cost will begin to abate. By the end of 2030, banks will be able to save up to $27 billion on cross-border settlement transactions thanks to the deployment of blockchain technology, which will result in a more than 11% cost reduction (Wang et al., 2019). Per participant feedback, the following are the various ways blockchain technology can reduce banking expenses. Participant Two indicated that since blockchain technology is decentralized, reducing intermediaries means transactions can be validated without needing an intermediary. Participant Five indicated that it has the potential to significantly lower the price of using intermediaries. Participant Ten stated that blockchain technology enables faster transactions, regardless of the time of day or week, to be processed almost instantly. Participant Fourteen stated that costs incurred by traditional banking systems' time delays can be minimized by this speed. Participant Seven stated that improved cryptographic security of blockchain technology can reduce fraud and unauthorized transaction costs. Participant Five stated that all transactions are accessible on the blockchain's ledger, lowering audit and regulatory compliance expenses. Participant Eight indicated that by using smart contracts, blockchain technology may

automate several financial operations, saving money for human capital. Participant One indicated that it is perfect for usage in banking, where it cuts expenses and streamlines procedures.

In conclusion, blockchain technology can dramatically reduce banking expenses by eliminating intermediaries, accelerating transactions, improving security, increasing transparency, and automating procedures over time. Therefore, this paper argues that the concepts of The Financial Intermediation Theory of Banking will become less critical with the implementation of blockchain technology in the banking industry. The banking industry has made significant investments in blockchain technology partly due to the speed at which lawful transactions can be fraudulently obtained. Blockchain technology will achieve this by eliminating middlemen. According to estimates, more than 50% of money laundering occurs within the transaction system, which includes intermediaries like stock exchanges (Raffelini, 2019). Technology will, therefore, significantly impact the financial industry and protect institutional records from potential intrusions.

RQ2) How do certain technical limitations of blockchain technology hinder its potential in a bank?

This question is mainly associated with the theme of limitation. The word search results indicated that regulations, risks, and security are the most significant concerns. Participant Six stated that adoption must be widespread for blockchain technology to be effective. Participant Five stated, “With blockchain technology gaining acceptance, this is an exciting time in the financial industry.” Participant Thirteen stated that.

> Banks such as JPMorgan Chase are actively working on Quorum and other platforms that demonstrate the potential of blockchain technology in various applications, including trade finance and payments. This active participation of banks, such as Goldman Sachs'

> investments in blockchain startups, is evidence of blockchain's bright future in the finance sector.

Participant Nine stated that the fact that this technology still needs to be widely accepted may restrict its usefulness to the financial sector. Participant Fifteen stated that,

> Numerous blockchain technologies exist, each with unique guidelines and procedures. The absence of standards may hinder integration. It can be costly to use blockchain technology, especially for large financial organizations that still rely on outdated methods. Switching to a new system can be prohibitively expensive.

Participant Six stated that since blockchain is a complex technology requiring further public education, financial institutions may be reluctant to adopt it. This paper argues that the inherent limitations of blockchain technology will negatively impact banks' profitability and asset and liability growth, leading to a decrease in shareholders' net worth.

RQ3) What is the suitability of blockchain technology across various commercial banking domains?

This question helps the researcher outline the blockchain technology products that the Federal Reserve identified as the most popular in the banking industry. These products are most suitable for positively or negatively affecting shareholders' net worth. Participant Five stated that the digital currency stablecoin or payments system is the most suitable for the banking industry. When implemented, they will create new and expanded income streams. Participant Ten stated that the Federal Reserve is examining the implications of these technologies after realizing their potential. The creation of a digital currency issued by central banks (CBDC) is being investigated by the Federal Reserve. Participant Eleven stated that a new form of safe currency, a CBDC, might offer advantages like quicker and less expensive transactions. However, it might also come

with risks related to financial stability and privacy issues, which are being researched. Participant Twelve stated that.

> A stablecoin cryptocurrency is designed to reduce price volatility and is usually tied to an asset reserve. It might offer a more reliable and efficient method of trade. However, stablecoins come with risks, such as a decline in the value of the underlying assets or the potential for the system to be abused for illegal purposes.

Participant Two indicated that the FedNow Service is a brand-new, 24/7, real-time payment and settlement service created by the Federal Reserve. Enabling quicker and more efficient payments benefits banks and opens new revenue sources. Participant Four stated that it is crucial to remember that, despite these technologies' potential, they also come with several risks and challenges. It remains to be seen how widely they will be adopted and how they will affect the banking sector's revenue streams.

Participant Eight stated that,

> Adopting stablecoins and digital currencies into the bank's financial services is the first step. Transaction fees for purchasing, selling, and transferring stablecoins and digital currencies can generate bank revenue. If the bank can attract a sizable clientele, these fees can be a substantial source of income.

Participant Nine stated that creating a digital payment system that is reliable, safe, and easy to use will attract additional clients. Participant Eleven stated that banks can charge businesses that use bank payment systems, generating extra revenue. Participant Thirteen stated that banks can provide loans in stablecoins and digital currencies to collect interest. Participant One stated that banks are equipped to provide stablecoin and digital currency investing services. These services include managing clients' money, advising them on which currencies to buy, and collecting fees.

Participant Three stated that businesses that wish to use stablecoins and digital currencies as payment can collaborate with banks. The bank could facilitate these transactions for a fee. Participant Twelve stated that staking is a feature of some digital currencies that allows users to get paid for storing and confirming transactions on the currency's network. Banks could offer their clients staking services in exchange for a portion of the profits. Although these strategies can generate revenue, they come with associated risks, such as the unpredictability of virtual currencies, regulatory challenges, and the need for robust security measures to prevent fraud and theft. New revenue streams can help to improve shareholder net worth by providing higher profit margins.

RQ4) What is the relationship between blockchain technology implementation and banks' shareholder net worth?

Blockchain technology is still in its infancy. A complex and nuanced relationship exists between its use and banks' shareholder net worth. Participant Eight stated that implementing blockchain technology has the potential to yield substantial cost savings in various financial domains, including securities trading, cross-border payments, and regulatory compliance. The decrease in expenses can potentially boost banks' net profits, augmenting shareholders' net worth.

All the interview participants agreed that transparency and traceability are two of the most important aspects of blockchain technology for banking shareholders (P100, P101, P102, & P110). Participant Nine stated that blockchain technology makes a decentralized, transparent ledger system with all transactions recorded and available to all contributors possible. Participant Six stated that,

> This transparency may lower the banking system's error and fraud rates. It also increases the transparency of the bank's operations by enabling shareholders to see all its transactions and helps to improve net worth through efficiency.

Participant Three stated that blockchain technology can make banking procedures much faster and more efficient. The clearing and settlement of transactions in traditional banking systems can take days and frequently involve many intermediaries. Blockchain technology can streamline and automate these procedures, eliminating the need for intermediaries and enabling nearly immediate transactions.

> Blockchain has the potential to bring banks new sources of income. For example, banks can provide their clients with blockchain-based services like safe and quick international money transfers, which may raise both the bank's earnings and the net worth of its shareholders.

Participant Five stated that blockchain technology can enhance banks' risk management capabilities by providing a secure, transparent, and tamper-proof system for recording transactions. This can decrease the risk of fraud and operational errors, positively impacting the bank's financial stability and shareholders' net worth. Blockchain and other cutting-edge technologies can enhance a bank's reputation in the marketplace. As a result, the bank's stock price may rise, increasing the net value of its stockholders.

RQ5) How much cost saving can a bank realize by implementing blockchain technology in their lending process?

It is crucial to remember that implementing blockchain technology comes with many dangers and expenses. How well the bank handles these expenses and risks will determine its impact on its shareholders' net worth. The subject question is outlined mainly by theme income

statement, efficiency, and product suitability. According to Cai (2018), a World Economic Forum study suggests that blockchain technology might save up to $20 billion in yearly costs related to banking infrastructure. The study also found that applying blockchain technology may reduce international payment costs by up to sixteen billion dollars annually. Participant Four stated that these cost savings would directly translate into decreased fees for the consumer receiving them. Participant Seven stated that,

> blockchain technology can assist banks in reducing expenses across several areas. One of these is the financial management of transactions. Blockchain technology can save time and money by reducing the number of steps needed to complete a payment. Another area where blockchain technology could result in cost savings is international financial transactions. Blockchain technology can reduce global payment processing times, saving financial institutions money.

Finally, the technology underlying blockchain has the potential to reduce compliance expenses. Financial institutions could save money on compliance by automating their compliance processes using blockchain technology. Implementing blockchain technology significantly reduces costs for financial organizations like banks. Consumers would directly benefit from these cost savings through cheaper fees and levies.

The Conceptual Framework

The conceptual framework outlines the collection of widely acknowledged theoretical precepts that form the basis of a particular study. These concepts guide the formulation and evaluation of practices in this study. The foundation of banking, the financial intermediation theory, the credit creation theory, the fractional reserve theory, and the trade-off theory are all connected to these ideas. Smart contracts, virtual currencies, and Decentralized Autonomous

Organizations are more blockchain-related ideas. Regulators such as the US SEC and the Federal Reserve are included. Additionally, it contains variables and constructs like cost, shareholders' net worth, and commercial banking. These ideas are combined with the previously defined themes above.

Based on participants' perspectives, banks can eliminate costs and increase processing speed and management efficiency with these blockchain products, creating a more agile operating environment. However, even with blockchain, the core of banking remains the same; the banking system's ability to produce money is based on the fractional reserve theory, with each bank acting as a simple financial intermediary by collecting deposits and disbursing them (Werner, 2016). Werner (2016) emphasized that banking will continue to make loans, purchase assets, and create credit and money by practicing the credit creation theory as its capital structure remains unchanged. According to Participant Seven,

> blockchain technology operates a bank based on a growing database or directory generated by a timestamp-added cryptographic hash, which offers numerous benefits. Unlike a traditional banking ledger, blockchain is decentralized. Banks leverage this technology to improve cost control and increase shareholders' net worth. While the technology has historically been used in a public setting, banks privatize it by employing the by-products.

According to Participant Fourteen, banks can use blockchain technology to establish decentralized autonomous organizations (DAOs) that can operate independently of a central authority. According to Participant Fifteen,

> Banks have begun implementing digital payment processing systems and other supply chain technologies. For instance, a bank creates a decentralized and automated

> blockchain. There is no conventional management structure for DAOs, as they allow banks to leverage the decentralized system to their advantage by using multiple networks, computers, or nodes instead of a single individual or entity. The DAO uses digital currency, which is secured by fiat money. Then, utilizing business logic, banks can have DAOs and digital currency communicate about commercial lending procedures through smart contracts and decentralized applications.

Based on Participant Fourteen, this synergy increases efficiency and reduces costs in the banking industry. While the benefits of implementing blockchain technology in banking are clear, it is essential to acknowledge its challenges. According to Participant Four,

> The Federal Reserve's primary goal of maintaining the financial system's stability means that banks will be subject to different regulations than other institutions. If the banks are listed on a public exchange, the Securities and Exchange Commission will also oversee them. This underscores the need for new legal frameworks and policies to accommodate the use of blockchain technology in banking.

Participant Thirteen stated that integrating blockchain technology may also require the establishment of new regulatory frameworks and guidelines to ensure the safety and soundness of the financial system. According to Participant Four, blockchain technology in banking has its challenges; the primary obstacle is scalability. Participant Fifteen said, "Integrating blockchain technology with current financial infrastructure might be difficult and expensive." According to Participant Seven, the processing speed of blockchain technology is limited to a set number of transactions per second. Outside of the regulatory limitations on the banking industry, Participant Twelve stated that blockchain could only disrupt the industry if it is broadly used. Participant Eight stated that for blockchain to be embraced in banking, it is imperative to establish the

necessary infrastructure. These ideas help to manage the limitations as the banking industry moves forward with implementing blockchain technology.

Anticipated Themes

Themes are developed based on our previous theoretical comprehension of the situation under examination (Ryan & Bernard, 2003). The predicted values and those discovered during the research process are compared to anticipated themes. Hughes et al. (2023) claim that expected themes recur through a thorough content analysis and a shared element among the conducted investigations. The researcher identified expected and unexpected themes from the data gathered in Sections One and Two of this research report, including the interview questions, conceptual framework, literature evaluation, and research questions. Five themes were expected. The income statement and balance sheet's financial themes were among these themes. Time, restrictions, efficiency, and products were among the non-financial themes. During data analysis, all five of these predicted themes became apparent.

Based on each interviewer's questions, themes were predicted. The theme related to Interview Question One aimed to illustrate the relationship between blockchain technology and cost. The way each participant answered this question differed according to their blockchain technology banking experience level. According to Participant Two,

> blockchain can be applied in banking in various ways. One way is by using smart contracts. Transaction automation is possible using smart contracts, which are self-executing agreements. Transaction efficiency may increase, and less human processing may be required. Digital tokens are another method that blockchain can be applied to the financial industry. Digital tokens can be used to symbolize assets like commodities or fiat money.

> This can be utilized to establish a safer and more effective method of transactions and lower banking industry costs.

Conversely, Participant Seven clarified that cost is always the main worry when implementing new technology, and blockchain deployment is no different. The initial and ongoing expenses of setting up and running a blockchain infrastructure could be higher than those of more conventional systems. However, as technology develops, these expenses are expected to decrease eventually. Also, Participant Four indicated that blockchain can streamline many current banking procedures, increasing productivity and lowering expenses. Participant Five stated, “The main reason for the big banks' enthusiasm for blockchain adoption has been the potential to generate millions more in revenue by cutting transaction costs.”

Interview Questions related to the limitations of blockchain technology and the obstacles obtained some of the following responses. Unlike others, the responses to the questions related to this theme varied based on variables that affected them while working with blockchain in the banking industry.

Participant Eight contributed by saying that scalability is a significant difficulty since financial institutions must be able to handle massive volumes of transactions.

Participant Fifteen contributed by saying, “Bitcoin and other blockchains have a significant security flaw: if more than half of the computers acting as network nodes spread a 'lie,' the 'lie' takes on greater weight than the truth. The '51% attack' was identified by Satoshi Nakamoto around the time of the Bitcoin launch.”

Participant Thirteen indicated that regulation and compliance are the main obstacles to blockchain adoption in the banking sector. Per Participant Four,

> High-quality data is a prerequisite for a blockchain database to function effectively. The integrity of data recorded on a blockchain is not inherently guaranteed, underscoring the importance of documenting occurrences as soon as they happen. This task should be prioritized to ensure the smooth operation of the blockchain system. The principle "garbage in, garbage out" remains relevant to blockchain systems of record in the same manner as to centralized or traditional databases.

Participant Seven indicated, "There have been many chances for disputes between various community segments because blockchain protocols can digitize government models, and miners are effectively creating another kind of incentivized government model."

Finally, Participant Thirteen also indicated that,

> The financial industry did not initially use blockchain technology, partly due to its limitations. However, this is changing, and the technology is now well-known, mainly due to its extensive application. To conduct research and implement blockchain technology, the international investment firm JP Morgan established a branch in New York named Quorum. Big banks like JP Morgan have expressed interest in blockchain technology.

There may be several difficulties with integrating blockchain technology with conventional systems. Participant Seven stated that the architecture and functionality of blockchain systems differ significantly from those of traditional systems. Blockchain technologies are decentralized, whereas conventional systems are centralized. This discrepancy may hamper effective communication and collaboration between the two systems. Participant Thirteen stated that systems built on blockchain, especially open ones, may have scalability problems. This implies that to manage the same volume of transactions as traditional systems, they might have to slow

down. Participant Fourteen stated that although blockchain technology is renowned for its security, combining it with conventional systems may lead to unexpected security flaws. For instance, the blockchain system can be at risk if a traditional system is corrupted. Participant Four stated that since blockchain technology is still relatively new, laws governing its application are still being created. Because of this, banks may find it challenging to guarantee compliance when integrating blockchain technology with more established processes. Blockchain technology implementation can be complex and demands high technical skills. This could be a hurdle for banks that require additional resources or expertise. It can be costly to integrate blockchain technology with conventional systems. This covers the price of the actual technology and the expenses associated with employee training and system upkeep. Participant Seven stated that,

It will take careful planning and strategy to overcome these obstacles. This entails selecting the appropriate blockchain platform, being aware of the organization's unique requirements and limitations, and ensuring the required tools and knowledge availability. Participant Thirteen also indicated that “the financial industry did not initially use blockchain technology, partially due to the limitations.” However, this is changing, and the technology is now well-known. This is mainly related to the extensive application of blockchain technology. To conduct research and implement blockchain technology, the international investment firm JP Morgan established a branch in New York named Quorum. Big banks like JP Morgan has expressed interest in blockchain technology (Wade, 2020).

Interview Questions related to blockchain suitability in banking obtained some of the following responses. The answers to this theme's questions varied depending on the factors that affected them as they worked with blockchain in the banking sector. Participant Thirteen stated,

"The same considerations that apply to any other industry should apply to the banking sector when implementing blockchain technology: cost, security, efficiency, and scalability." Participant three stated that,

Cost is always the main worry when implementing any new technology, and blockchain deployment is the same. The initial and ongoing expenses of setting up and running a blockchain infrastructure could be higher than those of more conventional systems. But as technology develops, these expenses are expected to eventually go down. Participant Two indicated that "safety comes first for financial organizations. Blockchain technology highly protects users' data by storing it in a distributed network impenetrable to hackers and resistant to fraudulent activities."

Participant Fourteen stated, "For financial organizations, security is paramount. Blockchain technology provides high data protection by storing it in a distributed network that is virtually impenetrable to hackers and resistant to fraudulent activities, making it an ideal solution for the banking sector." Participant Eight stated, "Efficiency is an important additional consideration. Blockchain technology holds the potential to streamline numerous current banking procedures, leading to increased productivity and reduced expenses." Participant Thirteen also stated that scalability is a significant difficulty since financial institutions must be able to handle massive volumes of transactions. With its scalable architecture, the blockchain can process billions of daily transactions. Participant Five indicated that decentralized cross-border payments, in which banks are directly connected on the same network and transactions are approved immediately, are made possible by blockchain technology. Because fewer middlemen are required, transactions become safer and more efficient.

Interview Questions related to blockchain implementation in banking obtained some of the following responses. Following her explanation of cost during the interview, the researcher asked the participants to talk about the implementation and the extent of the impact on the banking industry. Individual replies could have been more consistent and appeared to change depending on participant engagement. While some participants saw a gap, others thought it would be effective. Participant Thirteen stated,

> One reason the industry is adopting blockchain technology is its potential to lower bank transaction costs drastically. Money transfers frequently come with costs and require paperwork because different regions have different currencies. Banks are keen to take advantage of this prospect, as blockchain technology allows transactions without these fees and documentation. The central banks' enthusiasm for blockchain adoption stems mainly from the technology's ability to reduce transaction costs and increase revenue by millions of dollars.

Other participants indicated that these activities mainly involve specific cross-border exports and imports and paperwork-intensive financial sector transactions like factoring and billing (P99, P104 & P130). The industry is expected to operate more efficiently if blockchain technology is used for transactions. The movement of these transactions, especially those that are international, may be quickly accelerated with this technology and the smart contracts that both digitize and serve as documentation. Blockchain technology is expected to continue to impact the financial system due to the rising innovation on the Internet of Things, which is changing many industrial sectors (Knewtson & Rosenbaum, 2020).

Relationship to Literature

The section under "Relationship to Literature" examines the research findings, considering previous literature to identify areas of overlap and divergence. This section discussed the relationship between the research findings and the elements found in the literature review while taking advantage of existing literature to triangulate the data. The researcher aimed to understand this phenomenon from the participants' perspectives and employed a robust methodology (Creswell & Poth, 2018). Several themes were induced by the financial sector's adoption of blockchain technology. The main takeaway from the literature review, as articulated by Cucari (2022), is that blockchain technology disrupts traditional banking operations. Banks understand that they must employ blockchain technology if they want to stay relevant, as it is changing how they operate. This is supported by the study's findings that blockchain may help them develop and ensure that they remain relevant. This study's concepts, which are listed below, reflect this idea. Themes one and two are financially related, and themes three through six are non-financial related.

The income statement (operation) is the first theme. This is directly related to Dogru et al. (2019) statement on page P42, which states that with cost-saving and efficiency improvement potential, blockchain can displace existing banking activities established on traditional databases. The reassurance of potential cost savings and efficiency improvement is always a primary concern when deploying new technology, and blockchain adoption is no exception. Establishing and maintaining a blockchain infrastructure may come with larger upfront and continuing costs than traditional systems. However, as technology advances, these costs eventually go down. Increased retained earnings, infrastructure spending, new revenue sources, cutting out intermediaries, adoption, speed, reduced transaction costs, and management efficiency are

among the data points that characterize Theme One—operations. Participant Three noted the need for reduced processing and operational costs, removing intermediaries or mediators, and enhancing management performance to expedite and improve processing. The second theme is the balance sheet (value); the related data is recognized. Cucari et al. (2022) agree that banks must choose to innovate through blockchain implementation from 59. Transparency, assets, tokens, and decentralized autonomous organizations comprised the second data-defining subject. Participants suggested that it would make using smart contracts—self-executing contracts for business loans with the deal terms clearly stated in the code—easier. Banks may be able to boost shareholder value through asset appreciation by putting this technology into practice (P101 & P119).

The third theme is appropriate products related to data linked with byproducts of blockchain technology. This theme agrees with Dogru et al. (2019), who presented on P47 that banks can establish new services in addition to business operations based on blockchains. These products are consistent with the existing literature. Transferring assets, digital payment processing systems, supply chain technologies, digital currency, cross-border payment processes, stablecoins, tokenization, settlement processes, decentralized autonomous organizations, and quorum were among the data-defining themes two and three, respectively. Participants indicated that banks could issue stablecoins or digital currencies thanks to blockchain-based payment and clearing systems (P6, P8, P9, P25 & P34). The fourth theme relates to appropriate data-related goods for the banking sector's future use of blockchain technology. This theme is consistent with Rajnak and Puschmann's (2020;2021) statement on P63 that blockchain technology is predicted to reshape existing business models in the financial services industry. Modifying banks' capital requirements, implementing, forecasting, projecting, potential, interoperability, and the ability to

completely rewrite history were among the data-defining themes four and five. These themes, except for interoperability, are consistent with the existing literature. Participant Five believes that in the future, blockchain technology will inspire significant innovation in banking. The fifth theme is data-related efficiency, which leads to improvement. According to Rajnak and Puschmann (2020) from P59, blockchain technology can revolutionize banking by introducing new business models that challenge the existing status quo. According to participants, the process is essentially more efficient than prior methods since it automates, removes the need for intermediaries, and reduces the risk of fraud (P98, P99, P108, P109, P117, P122, P129). The constraint about data linked with improvement concludes theme six. Based on Casey's 2018 statement on P48, financial business practices may encounter several challenges when introducing blockchain technology. Strict restrictions, compliance, legal obstacles, difficulties, volatility, environmental impact, preserving privacy, scalability issues, inequity, impediment, and ambiguity were among the data-defining themes five. These blockchain-related elements in this study challenge traditional banking methods and shed light on the literature that precedes them.

The Problem

The problem statement was validated through existing academic literature and interview responses from bankers. Academic studies have disclosed that implementing blockchain technology significantly impacts the banking industry and that the relationship between lower costs and shareholders' net worth is related. The initial and ongoing expenses of setting up and running a blockchain infrastructure could be higher than those of more conventional systems (Hassija et al., 2021). On the other hand, as technology develops, these expenses should eventually decline. Initially, a decrease in shareholders' equity also results in a decline in the

value of their claim to the company's assets, which lowers their net worth. The research addressed the problem by initiating participant interviews. The data collected identified that blockchain technology is unique to the banking industry through variables such as operation, value, efficiency, products, and limitations. The research outcomes involved various and often multiple results from participants.

Summary of the Results

This research aimed to understand the disruptive nature of implementing blockchain technology and the potential for significant cost reduction, leading to higher shareholders' net worth in the banking industry. The research questions were mainly centered around cost. Using a distributed and decentralized ledger system enabled by blockchain can substantially decrease operational and administrative costs. This is primarily due to the lower costs associated with data processing and storage. Lower costs can occur by strengthening security, promoting data integrity, eliminating intermediaries, automating operations, and enabling cross-border transactions.

In conclusion, although blockchain technology may help the banking sector, several drawbacks may prevent it from improving retained earnings by lowering costs. These include problems with integration, scalability, privacy, regulatory hurdles, volatility, and adoption and trust issues. Overcoming integration difficulties requires careful strategy and planning. This entails figuring out which blockchain platform is best for the organization, understanding its unique requirements and limitations, and ensuring the necessary tools and knowledge are available.

Quantitative Findings

Introduction

Relevant secondary sources from the Federal Reserve databases (FRED) provide definitive and thorough information. To meet the precise goals of the study, the researcher and the quantitative data were coded, cleaned, analyzed, presented, and conclusions drawn. The data on each variable were analyzed using both descriptive and inferential statistics. Additionally, data was provided in frequency distribution tables to aid in the description and justification of the study's conclusions. The objectives of the inferential statistics were to ascertain the link between independent, moderating, and dependent factors and evaluate the hypothesis presented in the first chapter.

The study utilized secondary information for the dependent and explanatory factors from The Federal Reserve databases (FRED). The database was created from speeches and testimonies written or performed by the Governors of the Board of the Federal Reserve using the following Boolean String: (blockchain* OR distributed*) AND (profit* OR revenue OR cost OR expense* OR "retained earnings*). The information involved contained financial data points, the dependent variable. The non-financial points were associated with blockchain technology suitable products, efficiency, limitations, and time (the charts are listed below), the independent variables. The information was collected from speeches and testimonies written or performed by the Governors of the Board of the Federal Reserve over the last 20 years with 49 observations.

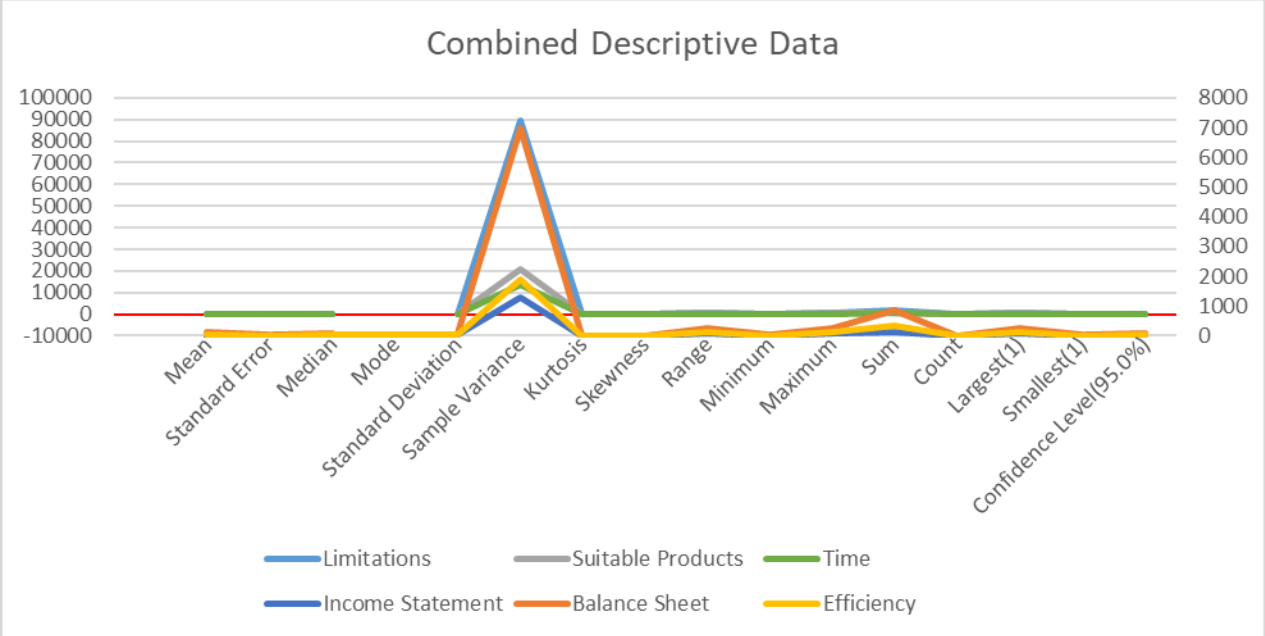
Descriptive Statistics

Table 4

Descriptive Data						
	Income Statement	*Balance Sheet*	*Suitable Products*	*Efficiency*	*Limitations*	*Time*
Mean	15.86	123.14	114.14	51.57	284.00	92.14
Standard Error	13.53	31.54	54.17	16.53	113.09	44.28
Median	3.00	95.00	52.00	43.00	134.00	50.00
Mode	3.00	#N/A	#N/A	43.00	#N/A	#N/A
Standard Deviation	35.80	83.44	143.33	43.73	299.21	117.14
Sample Variance	1281.48	6961.48	20543.81	1911.95	89528.00	13722.48
Kurtosis	6.98	1.14	3.52	5.48	-0.87	-0.02
Skewness	2.64	1.08	1.87	2.23	1.03	1.24
Range	96.00	250.00	410.00	133.00	732.00	292.00
Minimum	1.00	28.00	1.00	14.00	22.00	5.00
Maximum	97.00	278.00	411.00	147.00	754.00	297.00
Sum	111.00	862.00	799.00	361.00	1988.00	645.00
Count	7.00	7.00	7.00	7.00	7.00	7.00
Largest(1)	97.00	278.00	411.00	147.00	754.00	297.00
Smallest(1)	1.00	28.00	1.00	14.00	22.00	5.00
Confidence Level(95.0%)	33.11	77.16	132.56	40.44	276.73	108.34

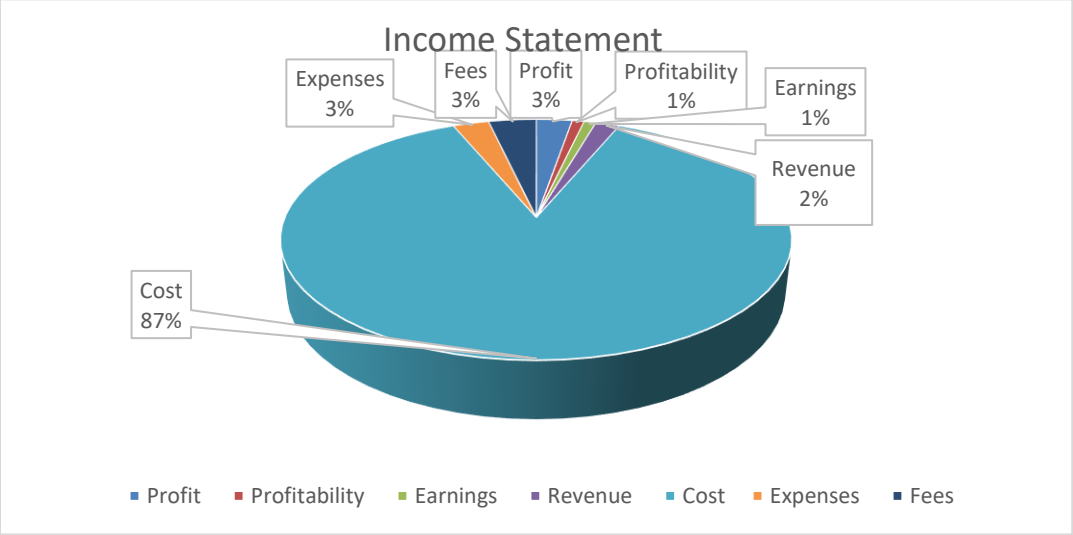
In Table 4 above, a descriptive analysis of the variable types is provided, including simple variance, skewness, kurtosis, mean, median, range, and standard deviation.

Figure 4



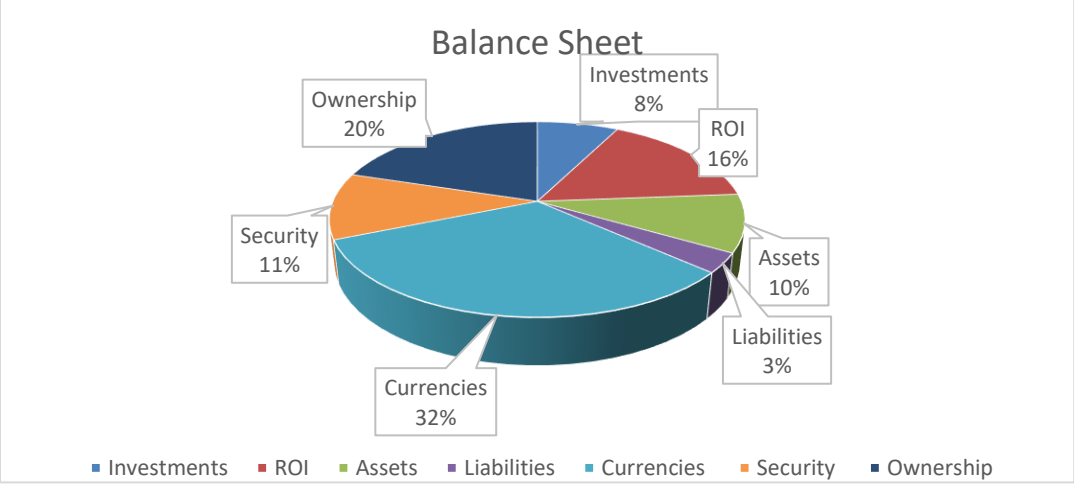
In Figure 4 above, a combination of the descriptive analyses of the variable types is provided. The chart shows the area of the descriptive data with the largest sample variation. The two largest are limitation and balance sheet.

Figure 5



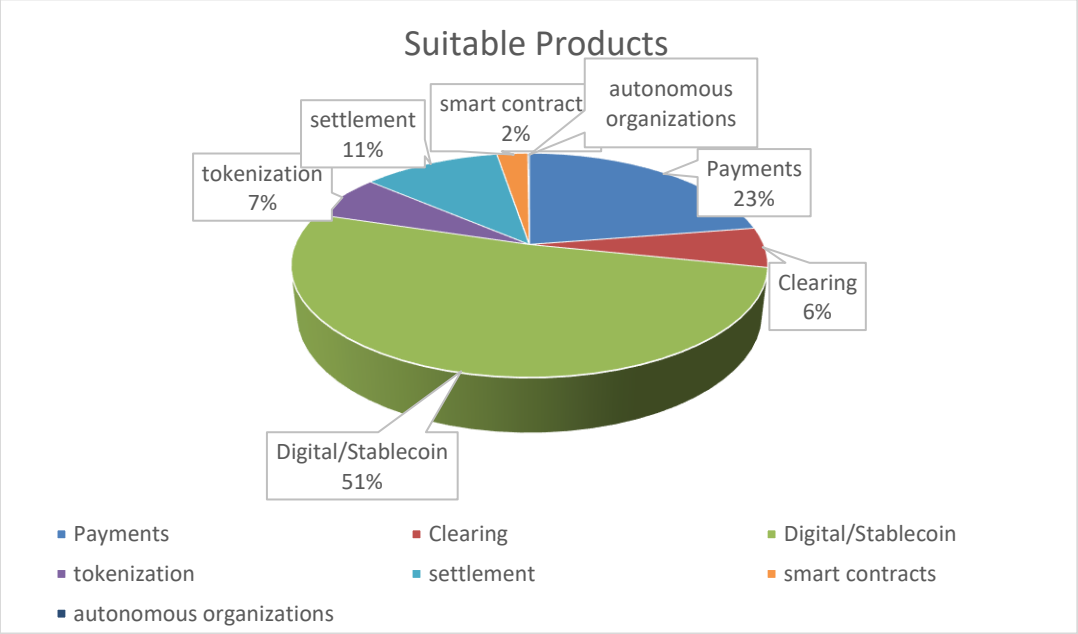
The mean of data points was 15.86, and the standard deviation was 35.8. The lowest value was 1, which is related to profit and profitability. The item that received the most data points is cost, which is 97.

Figure 6



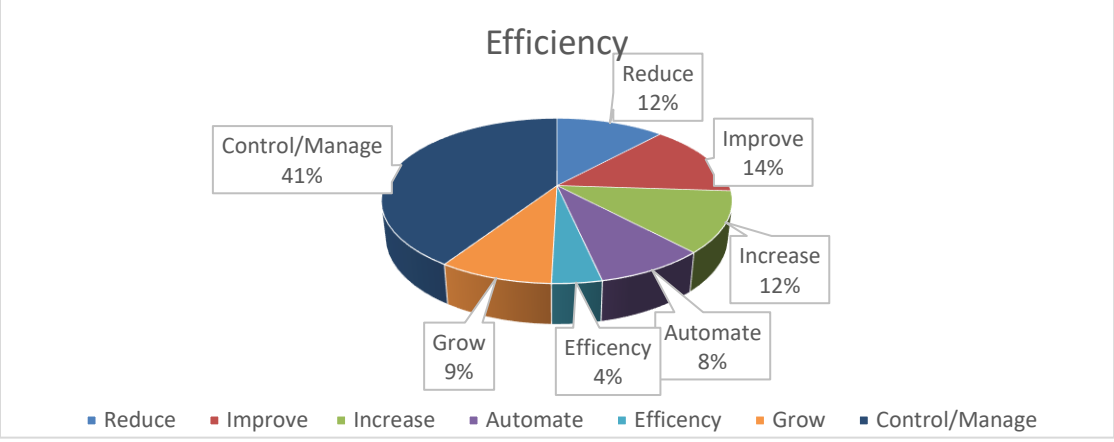
The mean of data points was 123.14, and the standard deviation was 83.44, with the lowest value being 28, related to liabilities. The item that received the most data points was currencies, which is 278. The results revealed a general impact on cost.

Figure 7



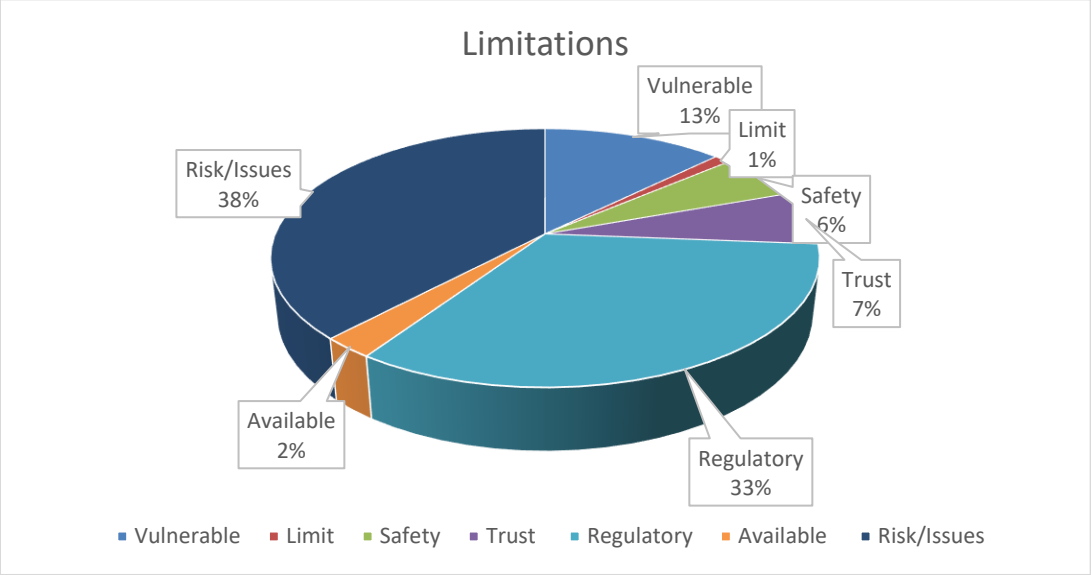
The mean of data points was 114.14, and the standard deviation was 143.33. The lowest value was 1, which is related to Autonomous Organizations. The item that received the most data points was stablecoin, which is 411.

Figure 8



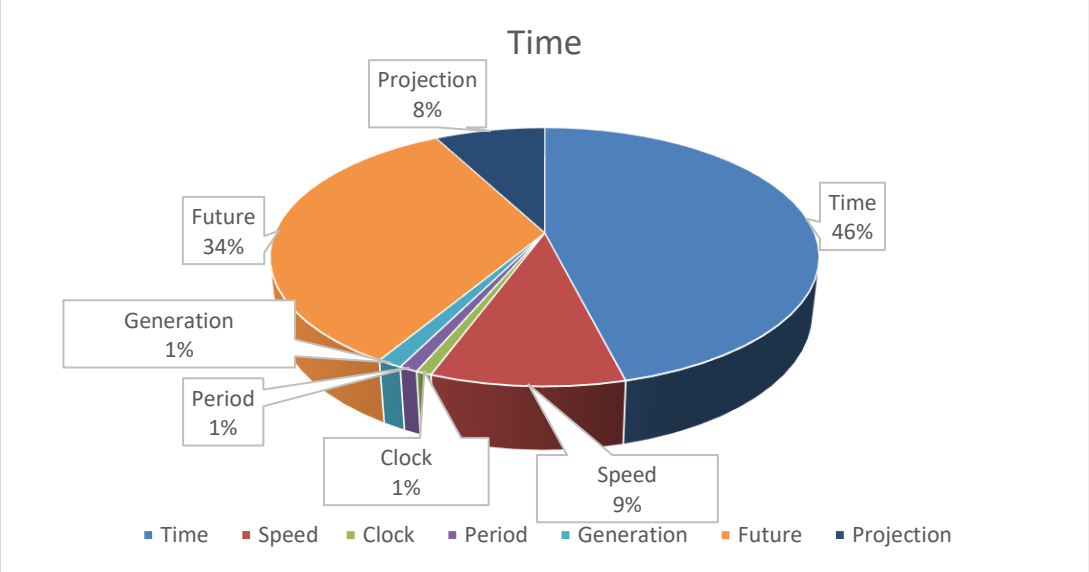
The mean of data points was 114.14, and the standard deviation was 143.33, with the lowest value being 1, which is related to Autonomous Organizations. The item that received the most data points was control, which is 147.

Figure 9



The mean of data points was 284, and the standard deviation was 299.21, with the lowest value being 22.

Figure 10



The mean of data points was 92.14, and the standard deviation was 117.14, with the lowest value being 5, which is related to the clock. The item that received the most data points was time, which is 297.

This section focuses on testing sample adequacy and factor results on the variables, followed by acquiring descriptive results to support inferential tests. For test use, there are a total of 6 groups. The ANOVA test is used to compare the means of the groups to see if at least one group's mean differs from the others.

Table 5

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Income Statement	7	111	15.85714	1281.476
Balance Sheet	7	862	123.1429	6961.476
Suitable Products	7	799	114.1429	20543.81
Efficiency	7	361	51.57143	1911.952
Limitations	7	1988	284	89528
Time	7	645	92.14286	13722.48

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	300923.3	5	60184.67	2.695858	0.036095	2.477169
Within Groups	803695.1	36	22324.87			
Total	1104618	41				

The F critical value, also known as the F crit, is a threshold used in an ANOVA (Analysis of Variance) test to determine if the observed F statistic is significant. Since the calculated F statistic is greater at 2.69 than the F crit of 2.48, this indicates a discernible difference between the observed variances between the group means and the variance within the groupings. Since

the computed F's probability value (P-value) is sufficiently low at 0.036, the null hypothesis (H_o) was rejected. The null hypothesis is that blockchain technology does not affect banking shareholders' net worth. In summary, the income statement, balance sheet, products, efficiency, limitation, and time all showed significant links when analyzed using descriptive statistics and ANOVA, underscoring the significance of integrating blockchain technology in the banking sector and on shareholders' net worth.

Table 6

Tukey's HSD of 1.944627					
Group	**Income Statement**	**Balance Sheet**	**Suitable Products**	**Efficiency**	**Limitations**
Income Statement					
Balance Sheet	107.2857143				
Suitable Products	98.28571429	9			
Efficiency	35.71428571	71.57142857	62.57142857		
Limitations	268.1428571	160.8571429	169.8571429	232.4285714	
Time	76.28571429	31	22	40.57142857	191.857143

See means above in Table 5

Tukey's Honest Significant Difference (HSD) test is an essential post-hoc analysis in this study's statistical analysis. It is designed to compare group means pairwise and identify those that differ significantly. The test value in the Tukey Test is denoted by the symbol (q). In the context of a Tukey test, the "q" value of 1.944627 represents the studentized range statistic used to determine the test's critical value. This critical value is compared with the computed differences between group means to ascertain significance. Since all the computed q values in the figure are higher than the critical values, the differences in those means are regarded as statistically significant.

Table 7

Correlation Among Variables

	Income Statement	*Balance Sheet*	*Suitable Products*	*Efficiency*	*Limitations*	*Time*
Income Statement	1					
Balance Sheet	0.823130088	1				
Suitable Products	-0.09328586	-0.254721671	1			
Efficiency	-0.361747283	0.108929086	-0.260654624	1		
Limitations	0.573049545	0.716792579	-0.25722198	0.512510061	1	
Time	-0.30328474	-0.329537277	-0.097687176	-0.082112556	-0.2440946	1

A correlation chart was created to understand the correlation between the strength and direction of the dependent, independent, and mitigating variables. This chart displayed the correlation coefficients and quantified the degree of linear relationship between variables. The correlation coefficient ranges from -1 to 1, with -1 representing a perfect negative correlation, 1 representing a perfect positive correlation, and 0 indicating no linear correlation. The highest correlation was between the income statement and balance sheet at 82%, followed by the balance sheet and limitations at 72%, and limitations and income statement at 57%. The lowest correlations were between the income statement and efficiency (-36%) and the income statement and time (-30%). Another low correlation was between the balance sheet and time (-32%). Below are some visual overviews of the Data.

Figure 11

RQ1: Does blockchain technology positively affect cost reduction in commercial banking? Variables related to this question include the income statement, time, and balance sheet. According to the chart below, they are highly correlated.

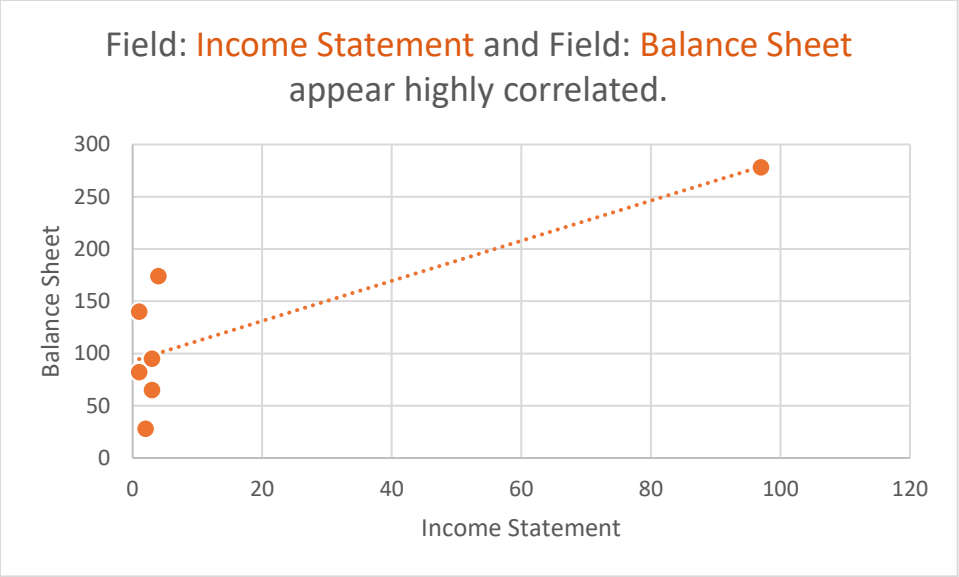


Figure 12

RQ2 and RQ5: Is there a relationship between the efficiency of blockchain technology and its impact on the banking industry? Variables related to this question encompass the income statement and appropriate financial products. According to the chart below they are highly correlated.

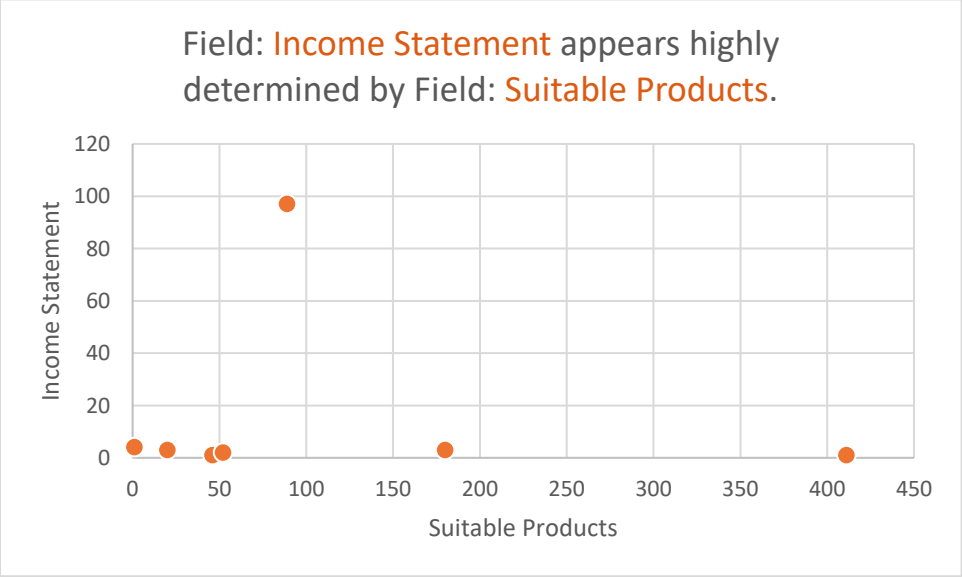


Figure 13

RQ3: To what extent is blockchain technology suitable across different domains within commercial banking? The variables associated with this question are the income statement and efficiency. According to the chart below, they are highly correlated.

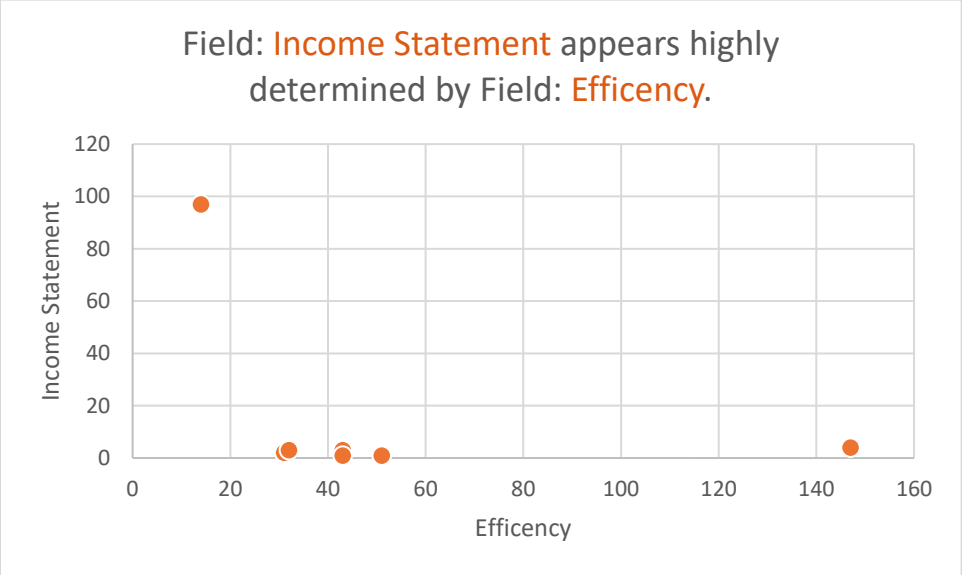


Figure 14

RQ4: What is the correlation between the implementation of blockchain technology and the net worth of banking shareholders? The variables associated with this question are limitations and efficiency. Per the chart below they are highly correlated.

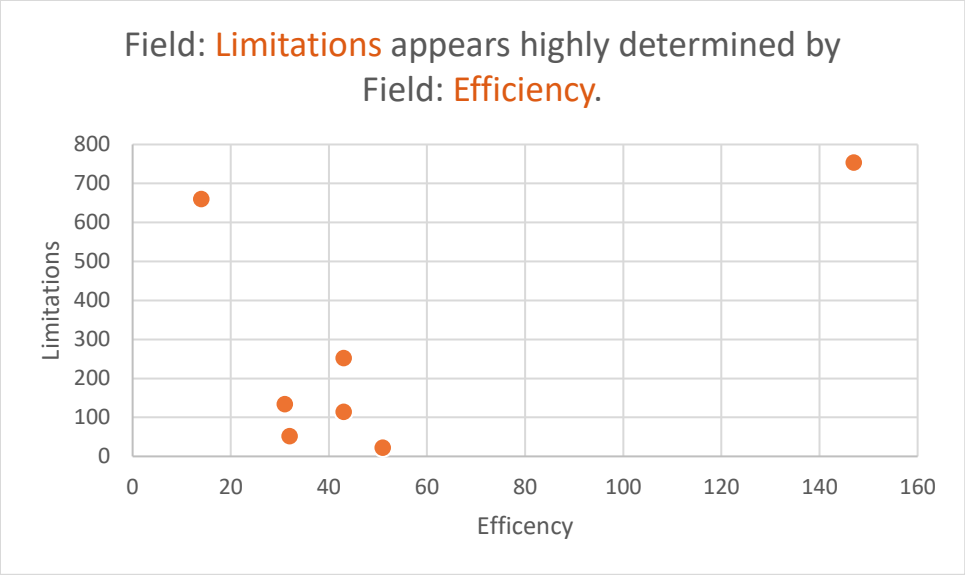


Table 8

Figure Regression Model.

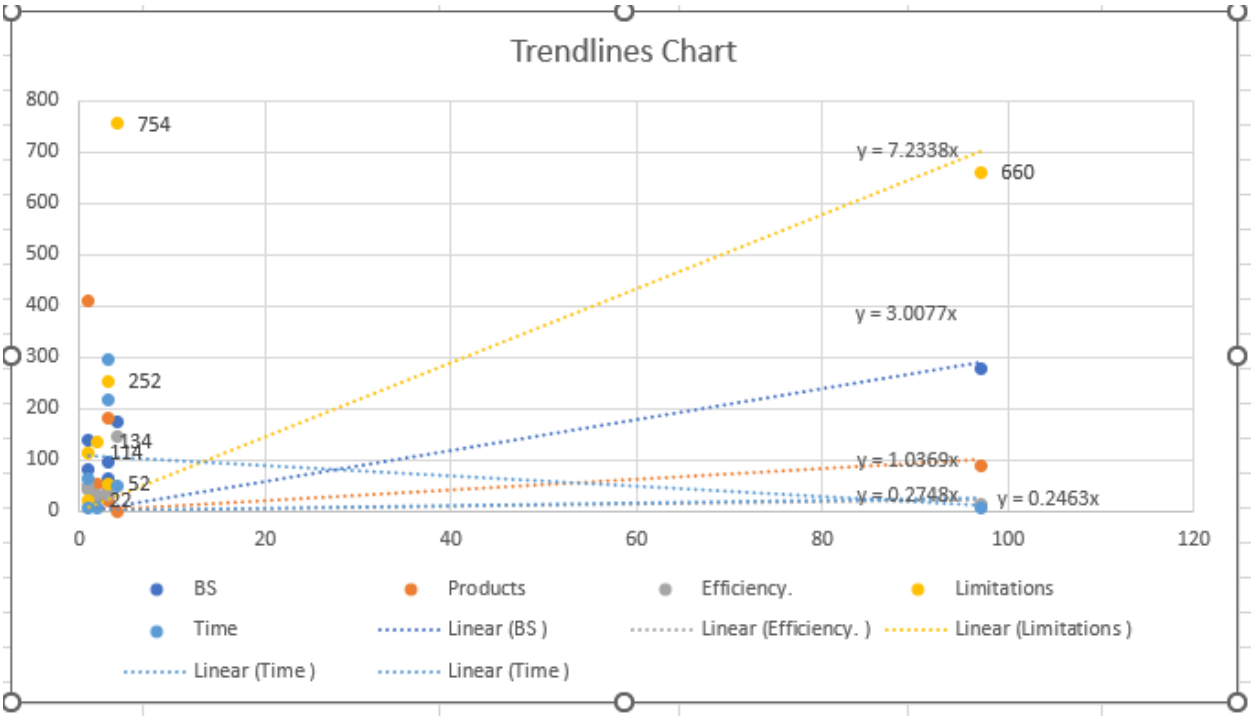
SUMMARY OUTPUT REGRESSION MODEL								
Regression Statistics								
Multiple R	0.999999468							
R Square	0.999998937							
Adjusted R Square	0.99999362							
Standard Error	0.090418731							
Observations	7							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	5	7688.848967	1537.769793	188093.8126	0.001750557			
Residual	1	0.008175547	0.008175547					
Total	6	7688.857143						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	6.098920756	0.121678229	50.12335251	0.012699377	4.552852269	7.644989244	4.552852269	7.644989244
Balance Sheet	0.183870026	0.000744306	247.0354628	0.002577024	0.174412719	0.193327333	0.174412719	0.193327333
Suitable Products	-0.00607822	0.000281771	-21.5714973	0.029490967	-0.009658458	-0.002497981	-0.009658458	-0.00249798
Efficiency	-0.604747099	0.001124118	-537.9746999	0.001183362	-0.619030374	-0.590463825	-0.619030374	-0.59046382
Limitations	0.074200035	0.000227551	326.0803999	0.001952334	0.071308721	0.077091349	0.071308721	0.077091349
Time	-0.02252384	0.000342601	-65.74366612	0.009682616	-0.026876997	-0.018170683	-0.026876997	-0.01817068

The percentage of the dependent variable's variance that can be predicted from the independent variable(s) is indicated by the R square, which is 0.999999468. An R2 of 0.99 means that the model accounts for 99% of the variance in the dependent variable. Multiple regression analysis quantifies the direction and strength of a linear relationship between the observed and predicted

values using the correlation coefficient, or multiple R, which ranges from -1 to 1, with 1 denoting an ideal positive linear relationship. A higher multiple R-value indicates a stronger relationship. The adjusted R square, which considers the number of predictors and helps prevent overfitting, is 0.9999998937. This is a precise assessment of model fit. With a p-value of 0.001750557, the ANOVA shows that the overall regression model fits the data well. The F-statistic, at 188093.81, is significantly higher than its significance level. A low p-value (usually less than 0.05) indicates a statistically significant model. The T-values are higher than their P-values. High T-values indicate a substantial difference in the data, usually accompanied by low P-values, confirming the statistical significance of the results.

Figure 15

Variables Trendline

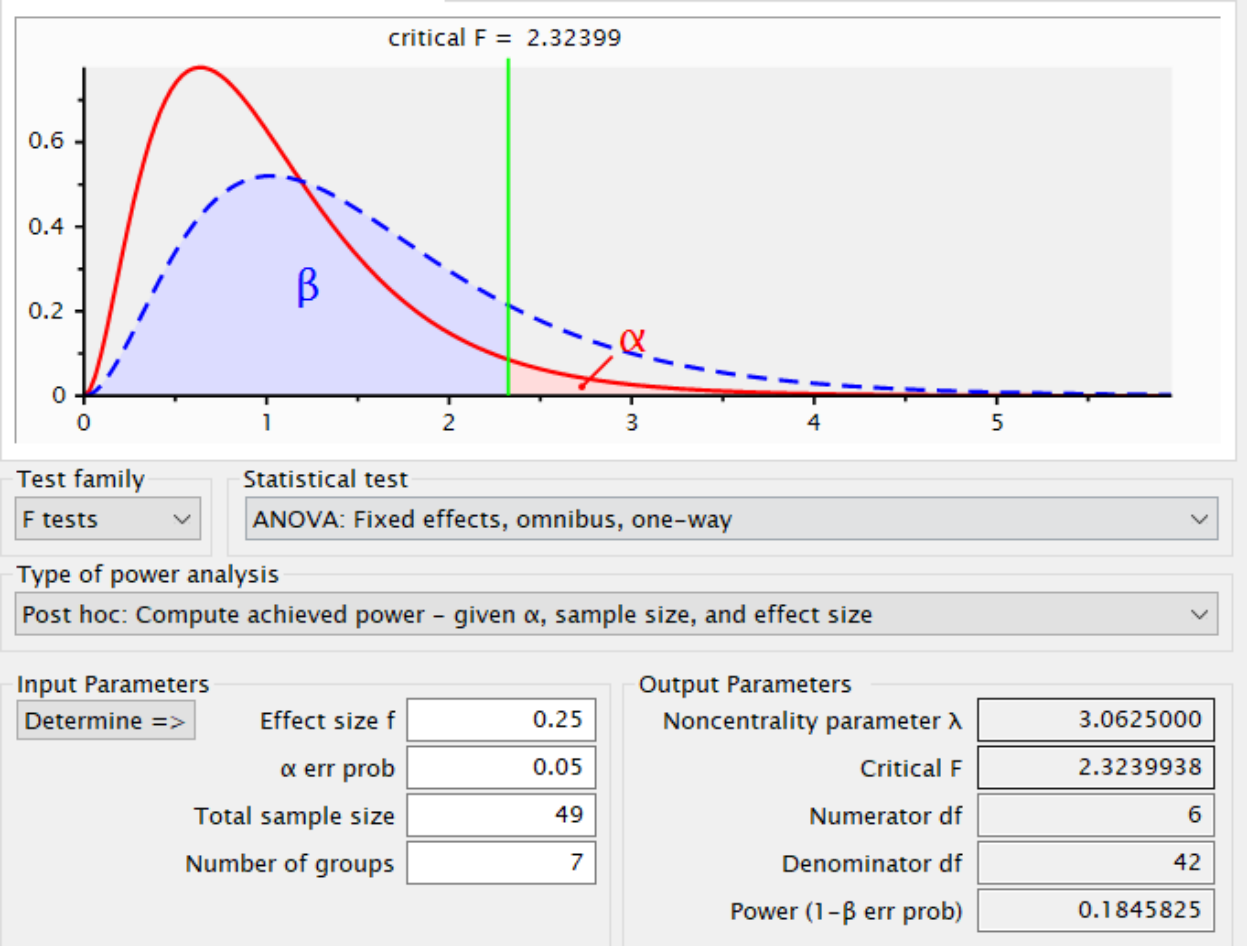


The coefficient values represent the regression line's slope (B1, B2, etc.) and intercept (B0).

Using t-statistics and p-values, each coefficient's significance is evaluated. The appropriate products, efficiency, and time have negative coefficients, while the limitations and balance sheet have positive coefficients. Negative coefficients indicate that the variable they multiply will have an inverse effect (a negative slope on the line) or an opposite effect on the expression's value. See the formula in Figure 15 above. In conclusion, the regression tool offers a solid, accurate, and thorough statistical assessment of the fit and significance of blockchain technology in the banking industry.

Figure 16

Type I & II Error



A Type I Error occurs when a true null hypothesis is rejected (see figure for result). The probability of making a Type I error is denoted by $\alpha = .05$, meaning there is a 5% chance of rejecting the null hypothesis when it is true. A Type II Error occurs if the study fails to reject a false null hypothesis. The probability of making a Type II error is denoted by β. The power of a test is defined as $1 - \beta$, which is the probability of correctly rejecting a false null hypothesis. $\beta = 82.6$ in Figure 16. Thus, the probability for this study of a Type II error is 18%, meaning there is an 18% chance of failing to reject a false null hypothesis. Because the hypotheses were tested, the following claims were validated. The information demonstrates that blockchain technology can help reduce expenses in the banking sector. The use of blockchain technology and the net worth of bank shareholders are related. Blockchain technology is suited for a wide range of commercial banking applications. However, some technological restrictions need to improve the promise of blockchain technology in the financial sector.

Relationship of the Findings

The Research Questions

The research supports the following statements. The data supports how blockchain technology can minimize costs over time in commercial banking. It also supports cost realization for the banking industry in the lending process. Specific technical limitations of blockchain technology hinder its potential in the banking industry. There is a relationship between blockchain technology implementation and banks' shareholder net worth. The suitability of blockchain technology across various commercial banking domains is favorable.

The data supports how blockchain technology can minimize costs over time in commercial banking. It also supports cost realization for the banking industry in the lending process. The item that received the most data points is 97 for the income statement. The item that

received the most data points was time for the mitigating variable "Time," which is 297. Since the computed q values for the income statement and time were higher than the critical values, the difference in those means is considered statistically significant. The income statement produces one of the highest correlations to the balance sheet at 57%. The income statement variable is heavily influenced by efficiency. Suitable products heavily influence the income statement. The probability for this study for a Type II error is 18%. In summary, the income statement and time showed significant links when analyzed using descriptive statistics and ANOVA, underscoring the significance of integrating blockchain technology in the banking sector and on shareholders' net worth.

While blockchain technology holds promise for the banking industry, it has limitations (Cucari et al., 2022). The limitation that received the most data points was regulatory, at 660, making it the most significant challenge. Risk/Issues and regulation variables comprise 71% of the data points, indicating a substantial regulatory burden. The difference in this mean is considered statistically significant, with the computed q value for limitation being higher than the critical values. The limitation variance from the mean was the largest, at 89,528, further underscoring the regulatory challenge. This variable was reported to have a 57% correlation against the balance sheet, indicating a significant impact on financial operations.

There is a relationship between blockchain technology implementation and banks' shareholder net worth. The balance sheet had the second-highest variance. Since the computed q for the balance sheet was higher than the critical values, the difference in this mean is regarded as statistically significant. The highest correlation was between the income statement and balance sheet at 82%. In summary, when analyzed using descriptive statistics and ANOVA, the

balance sheet showed significant links, underscoring the significance of integrating blockchain technology in the banking sector and shareholders' net worth.

The suitability of blockchain technology across various commercial banking domains is favorable. The suitable product has the third-highest sample variance, at 20,543.81, and the second-highest range, at 410.0. Digital currency makes up 51% of the data points. Since the computed q for the suitable products variable was higher than the critical values, the difference in this mean is regarded as statistically significant. In summary, when analyzed using descriptive statistics and ANOVA, the suitable product variable showed significant links, underscoring the significance of integrating blockchain technology in the banking sector and shareholders' net worth.

The Theoretical Framework

According to this study, the decentralized ledger of blockchain technology, which differs from a banking ledger, is disrupting the banking sector. Although banks can privatize technology by employing its by-products to increase shareholder wealth and better control costs, the technology has historically been used in a public setting. The data presented suggests that the banking sector is gradually transitioning to a decentralized autonomous organization (DAO), a blockchain organization that is automated and decentralized. To take advantage of the decentralized system, the management team will still be in place to oversee the numerous networks, PCs, or nodes. The DAO uses additional blockchain technologies, like digital currency backed by fiat money—an electronic medium of exchange that is created, stored, and transferred. Smart contracts are another product that fits the bill; they are decentralized programs that respond with business logic to events of commercial loan processes.

The data enabling blockchain implementation will impact a bank's capital structure. To control costs, they will handle debt and equity financing more skillfully. The information verifies that blockchain technology facilitates the development of more affordable deposit collection and lending products for financial intermediaries (Cucari et al., 2022). Blockchain will contribute to the preservation of liquidity by generating credit more quickly. Miners are individuals or groups that receive digital currency to add blocks to a blockchain network due to banks' autonomous nature. Verifying transactions is what they do. These miners will be the bankers in charge of creating and providing the bank's clients with commercial services. Implementing blockchain technology will save money and increase value for shareholders. The Federal Reserve will regulate banks differently, as maintaining the financial system's stability is its primary objective. This presents a barrier to adopting blockchain technology in the banking sector. The influence of other authorities, including the SEC, on publicly traded banks is another significant barrier.

The Problem

The researcher used descriptive statistics to examine and define the quantitative data from the field study. The variance analysis was based on information about the income statement, balance sheet, products, efficiency, limitations, and time to find out if there were any notable variations in the means of various groups. It examined how blockchain technology affected the financial sector to determine whether these aspects affected study-critical variables. The net worth of a bank's investors can be strongly impacted by its return on investment. Banks' adoption of this technology has the potential to generate new revenue streams and markets, hence augmenting shareholder value. Setting up the infrastructure needed to administer a worldwide network with compatible solutions is essential. The industry can only be disrupted by blockchain

if it is widely used. Lastly, studies indicate that the financial sector's adoption of blockchain technology will be significantly impacted by its limitations.

Summary

The data analysis, interpretation, discussion, and presentation of the research findings are all included in this section. The research objectives were followed when performing the data analysis, and the techniques are covered in detail in this study's third chapter. The methods used are inferential and descriptive. For the former, frequencies and statistics like means, variance, standard deviations, and ranges were calculated; the outcomes were then displayed in tables and charts. Testing hypotheses is part of the inferential analysis to find meaningful correlations between the data and explanatory factors. The data model was used to inform the following tests that were carried out: inferential statistics, Tukey tests, correlation tests, and regression models. A few diagnostic tests were run before the tests. To ensure the validity of the study outcomes, hypothetical and empirical examinations of the literature were used to highlight areas of understanding or disagreement with the findings of this research or study. Each of the six study objectives' descriptive analysis, diagnostic test, data description, and research findings contributed to the overall understanding of blockchain in the banking sector.

Summary of Mixed Method

The qualitative research findings have provided compelling evidence supporting the transformative potential of integrating blockchain technology within the banking industry. It has highlighted the ability of blockchain to reduce operational costs and significantly drive increased value for stakeholders. On the other hand, the quantitative research, characterized by detailed descriptive analysis, diagnostic testing, data description, and comprehensive exploration of the six study objectives, has unequivocally demonstrated a robust correlation between blockchain

technology and the banking sector. In summary, while blockchain technology holds great promise for the banking industry, it also presents formidable challenges. Issues such as integration, scalability, privacy, regulatory complexities, volatility, and concerns related to adoption and trust may hinder its capacity to optimize retained earnings through cost reduction. Addressing these challenges will require a meticulous and strategic approach involving the selection of the most appropriate blockchain platform for the organization, a nuanced understanding of its specific needs and limitations, and the assurance of possessing the requisite tools and expertise.

Chapter 5: Conclusions

The research findings were meticulously cross-checked by analyzing and translating the following themes against existing scholarly literature. Six main themes arose from the interviewer's viewpoints: cost, value, suitable products, efficiency, limitations, and time. A thorough comparison was made between these themes and the various parts of this research study, including the problem statement, research questions, conceptual framework, expected themes, and scholarly literature. After careful analysis, alignment with these components was found, instilling confidence in the robustness of the research. The approved IRB fieldwork was an enthusiastic and fruitful learning experience for the researcher. Thirty-five participants agreed to participate, but the researcher reached data saturation after interviewing fifteen participants. The researcher uploaded all participant interview responses, which had been transcribed using the most recent versions of Microsoft and Excel applications for additional coding and analysis. The emerging themes were time, cost, value, suitable products, efficiency, and limitations. However, two other sub-themes were captured: banks' steps to pursue a blockchain technology strategy and integration with conventional systems. Outside obstacles, including distance,

financial constraints, work schedules, and family responsibilities, have made it challenging to collect further feedback throughout the research study. This means that the study might need more examination and analysis. The themes developed via the research aligned with the researcher's observations during the data collection phase, linking all the research questions and participant contributions. The perspectives of large bank bankers (>$1 billion in assets), mid-size bank bankers (between $100MM and $1 billion in assets), and small-size bank bankers (> $100MM in assets) clashed multiple times throughout the research investigation.

The quantitative data was coded, cleaned, analyzed, and presented to achieve the study's precise goals, and conclusions were drawn from the quantitative data. The researcher used descriptive and inferential statistics to analyze the data for each variable. In addition, the researcher presented the data in frequency distribution tables to aid in describing and justifying the study's conclusions. The objectives of the inferential statistics were to establish the link between independent, moderating, and dependent factors and to evaluate the hypothesis presented in the first chapter. The data yielded two themes pertaining to finance: the income statement (operation) and balance sheet (value), which represent the independent and dependent variables. The other moderating themes were non-financial related. They were suitable products, efficiency, limitations, and time. These findings are significant as they comprehensively identified the relationship between banking shareholders' net worth and the implementation of blockchain technology. As described in existing academic literature, blockchain technology is a way for banks to continuously search for high-tech ways to minimize costs, increase value, and improve efficiency, leading to improved shareholders' net worth in the banking industry.

Addition to the Body of Knowledge

Introduction

This section provides a comprehensive understanding of the practical implications and importance of integrating blockchain technology within the banking industry. It offers a thorough evaluation of the potential impacts of blockchain on stakeholders' wealth, drawing on a blend of qualitative and quantitative data gathered from banking professionals. Furthermore, the research draws upon pertinent secondary sources from the Federal Reserve's databases to substantiate its conclusions. The findings suggest that blockchain can bolster reliability for customers, regulators, and shareholders by furnishing a secure, tamper-resistant ledger. This research is a significant step toward informing the banking sector about the potential of blockchain and the need for further exploration to scrutinize its enduring consequences.

Practical Implications

This segment delineates the research outcomes' practical applications and real-world significance. This is vital in bridging the gap between academic research and practical utility, elucidating how this work impacts practice, policy, or further exploration within the banking sector. The combination of qualitative and quantitative data from banking professionals yielded diverse perspectives on the implications of integrating blockchain technology within the banking industry. One of the key findings was the effects of blockchain on stakeholders' wealth, a crucial aspect that the research has brought to light. The primary data was gathered through semi-structured interviews with 15 bankers representing banks of various sizes and bankers from various segments of the bank and experiences.

Additionally, the researcher utilized relevant secondary sources from the Federal Reserve's databases (FRED), known for their high credibility in the field, to obtain

comprehensive and definitive information. The researcher analyzed 49 speeches and testimonies produced by the Governors of the Board of the Federal Reserve over the past two decades. The assessment thoroughly examined various components of the research study, encompassing the problem statement, research inquiries, conceptual framework, expected themes, and scholarly literature, culminating in a real-world understanding of blockchain technology in the banking industry. Finally, the researcher articulated a practical implementation for professional practice, emphasizing the real-world implications of the research findings.

The study found that blockchain can be more reliable for banking customers, regulators, and shareholders because it can serve as a secure, tamper-proof ledger, ensuring data integrity and transparency. These findings are particularly relevant because banks serve as critical storehouses and transfer hubs of value. As a digitized, secure, and tamper-proof ledger, blockchain could serve the same function, injecting enhanced accuracy and information-sharing into the financial services ecosystem. All these characteristics make blockchain a more reliable, promising, and in-demand solution for banks and their intermediaries. In conclusion, banks may gradually adopt blockchain technology to realize cost savings, expand their customer base, and maintain relevance. However, further research is needed to investigate the long-term impacts of regulation, scalability, and interoperability concerning blockchain technology in the banking sector. While the study offers valuable insights, its scope is limited to specific themes and subject areas. The researcher encourages future studies to consider broader contexts to substantiate these findings and explore the full potential of blockchain in the banking sector.

These technological resolutions are often incorporated into the strategic objectives of banks. Of these strategic objectives, minimizing cost and increasing productivity represent some of the most difficult challenges banks face in today’s competitive marketplace. According to

Buitenhek (2016), blockchain technology can be invaluable to the banking industry and be a source of sustained competitive advantage. Banks that develop a high-tech environment throughout the organization, recognizing the value of lowering costs and improving efficiency, will succeed in enhancing shareholder value (Chuadhry et al., 2023). Participant Fourteen explained that "blockchain makes financial transactions completely independent of intermediaries. As a result, the transaction fees that banks often pay to these intermediaries can be greatly reduced. Peer-to-peer transfers made possible by blockchain technology can expedite transaction processing. This can improve the efficiency of banking operations by cutting the processing time for transactions from days to minutes." Banks have been so successful over the past century because of technology. When discussing blockchain technology with the participants, even though there were mixed responses, the consensus was one of positivity. One reason is the longer-term effect it can have on the banking industry. Ali et al. (2023) state that blockchain can increase banks' profitability by reducing costs and improving efficiency. This can lead to higher dividends and a rise in share prices, thereby enhancing shareholder value. Another reason for implementing blockchain technology is the ability to expand revenue streams. Banks can offer new services like asset tokenization and smart contracts thanks to blockchain technology. These may open fresh sources of income, increasing shareholder value (Ali et al., 2023). According to Chuadhry et al. (2023), implementing blockchain technology aims to enhance productivity, boost efficiency, and advance organizational performance. Banks need to maximize their capacity by reducing duplication. Participant Four stated, "Banks put much work into complying with Know Your Customer (KYC) laws. Blockchain can offer a decentralized approach that reduces duplication by allowing other companies to access a customer's KYC verification once one has completed it." Lastly, according to this research study, although

blockchain holds great promise, it is not a panacea. Before implementing it, banks must thoroughly weigh the ramifications, including integration, security, and regulatory concerns.

The interviewers identified that blockchain technology presents a promising opportunity for banks to diversify their revenue streams, potentially gaining a competitive edge in the market (P99, P100 & P105). Several key areas exist where banks can harness blockchain to create additional income. Banks can optimize cross-border payments and remittances, facilitating faster and more cost-effective transactions to attract a more extensive customer base and boost transaction volumes. Moreover, by offering blockchain-based trade finance solutions, banks can streamline the trade finance process, charging fees for the provision of transparent and immutable ledgers, which can outperform traditional methods in terms of efficiency and security.

Additionally, banks can expand client investment opportunities and earn fees by providing services to tokenize physical and digital assets, such as real estate, art, or securities. Furthermore, banks can reduce operational costs and errors by developing and managing smart contracts for various financial services, allowing for more competitive pricing while upholding profitability. Offering Identity Verification and KYC services to other financial institutions and businesses generates revenue through service fees. Moreover, providing custody services for digital assets, such as safekeeping, transaction processing, and reporting, enables banks to securely store and manage clients' assets. Embracing Decentralized Finance (DeFi) allows banks to engage in or establish their own DeFi platforms, offering decentralized lending, borrowing, and other financial services to generate revenue through transaction fees, interest spreads, and service charges. Banks can leverage their expertise to offer consulting and development services for blockchain projects, guiding blockchain strategy, custom blockchain solutions, and integration with existing systems. Furthermore, developing and selling compliance solutions

utilizing blockchain for transparent and immutable record-keeping is a potential revenue source for banks. Lastly, monetizing anonymized customer data by offering insights and analytics to third parties while ensuring data privacy and security is an avenue for revenue generation by banks. Exploring these new revenue streams can enhance banks' profitability and foster growth and innovation within the digital financial landscape.

Applying blockchain technology within the banking sector empowers bankers to significantly enhance liquidity on banks' balance sheets. There are various ways in which this can be achieved. Firstly, blockchain offers enhanced transparency through real-time access to transaction data, providing professionals with a more precise and comprehensive picture of their assets and liabilities at any moment. The immutable nature of blockchain records also fosters increased trust among participants, reducing the need for extensive reconciliations and audits. Additionally, blockchain technology can facilitate faster settlement times than traditional banking systems, which often involve lengthy settlement processes due to intermediaries and manual procedures. By enabling near-instantaneous transactions, blockchain reduces the time assets are tied up, thereby mitigating counterparty risk and freeing up capital that banks would otherwise hold as a buffer.

Furthermore, blockchain technology enables the tokenization of both physical and financial assets. The resulting tokens can be traded on secondary markets, giving banks more liquid assets. Moreover, tokenization allows for fractional ownership, making it easier to sell portions of significant assets and thus improving liquidity. Smart contracts, another feature of blockchain technology, can automate and enforce contractual agreements, reducing the need for manual intervention and expediting processes. This automation leads to more efficient resource utilization and quicker turnaround times for financial transactions, making banking professionals

feel more productive and effective. An additional benefit of blockchain technology is the potential for decentralized finance (DeFi). Banks can leverage decentralized liquidity pools, which provide additional sources of liquidity. DeFi platforms offer innovative financial products that can aid banks in managing their liquidity more effectively. Furthermore, blockchain technology can reduce transaction fees by eliminating intermediaries, thereby improving the overall liquidity position of a bank. Streamlined processes and the reduced need for reconciliation also contribute to lower operational costs, freeing up more capital and making banking professionals feel more financially responsible and prudent in their decision-making.

Blockchain technology allows real-time monitoring of transactions and assets, enabling better risk management. Enhanced data analytics capabilities made possible by blockchains aid banks in more accurately predicting liquidity needs. In conclusion, by leveraging blockchain technology, banks can achieve greater transparency, faster settlement times, and more efficient processes, all of which contribute to improved liquidity on their balance sheets. The ability to tokenize assets and utilize smart contracts further enhances this liquidity, making blockchain a powerful tool for modern banking.

Applying blockchain technology to the banking sector can fundamentally change how banks operate. Blockchain technology might offer a secure, decentralized, immutable ledger for documenting transactions. This might lead to decreased costs, quicker transactions, and increased security and transparency. However, several problems must be fixed before the banking sector can fully adopt blockchain technology. These include the requirement for clear regulations, interoperability, and scalability.

In banking, accountability and openness are essential. However, the potential of blockchain technology to revolutionize the financial industry is immense. Only one bank and its

branches can access the banking blockchain, ensuring that only authorized parties can access sensitive information. According to Garg et al. (2021), only trustworthy nodes—organizations that verify transactions—are connected to the blockchain in this application. These nodes, often called “trusted nodes,” have been vetted and approved to participate in the blockchain network. They require access to the blockchain to function. Consequently, the blockchain is shared yet limited to these reliable nodes, guaranteeing security and transparency. This is just one illustration of how blockchain technology can revolutionize the financial industry. According to Participant Fifteen, blockchain technology will be hybrid in the banking industry. Participant Twelve stated, “All information can be shared as public data is required.” However, only one bank and its branches should have access to blockchain banking. Participant Nine noted, “Only trusted nodes are connected to the blockchain in this application, and the nodes themselves need access to the blockchain.” Only trusted nodes are allowed access to this shared blockchain. Participant Eight highlighted, “A significant obstacle is scalability since financial institutions must be able to handle massive volumes of transactions.” With its scalable architecture, blockchain can process billions of daily transactions. However, blockchain technology has a scalability problem. The processing time for each transaction rises with the number of transactions, which may restrict the efficiency of banking operations.

Participant Fourteen states, “The fundamental architecture of blockchain technology and the requirement to preserve decentralization and security are the primary causes of its scaling issues.” Participant Seven added, “The blockchain's transaction processing speed (TPS) is restricted.” Clementking et al. (2022) noted that the Ethereum blockchain can process data at roughly 15 TPS compared to 7 TPS for Bitcoin. This is far slower than conventional payment methods like Visa, which can process thousands of TPS. The time required to verify and add

each block of transactions to the blockchain causes this restriction. Participant Four pointed out that every node in the network must maintain a more extensive, distributed ledger as the blockchain expands. This can lead to storage problems, particularly for full nodes that track the blockchain's history, and it lengthens the time needed for newly added nodes to synchronize with the network. These issues make it challenging for blockchains to grow while preserving security. These challenges in blockchain scalability underscore the need for further research and development in this area.

Interoperability, a pivotal concept in blockchain implementation in the banking industry, is more than just a technical feature. It is a pressing need that fosters cooperation and amplifies the potential of the blockchain ecosystem. It acts as a conduit, enabling different blockchains to communicate and share information. This collaboration, where various networks can leverage each other's strengths, not only encourages cooperation but also significantly enhances the overall capabilities of the blockchain ecosystem, paving the way for a promising future. It makes it possible to develop more intricate and adaptable applications that may use several blockchains' characteristics. By facilitating the smooth flow of assets and data between various blockchains, interoperability can also increase efficiency by reducing the need for intermediaries. Interoperability, which permits communication between many blockchains, might encourage innovation in the blockchain field by releasing developers from the constraints imposed by a single blockchain. In conclusion, blockchain interoperability is not just essential but urgent because it promotes cooperation, improves communication, increases capacities, boosts efficiency, and encourages innovation within the blockchain community.

Blockchain technology regulation is necessary and a crucial pillar in the banking industry. As blockchain technology develops, it becomes imperative to tackle the legal and

regulatory ramifications associated with its implementation. This is to ensure that technology is applied ethically and responsibly. The US has set a precedent as the first country to grant regulatory permits for virtual money, demonstrating the requirement for a legal structure that other nations can also embrace. Users send their data directly to banks or other parties via blockchain technology. To safeguard the security and privacy of users, this data transmission needs to be controlled. Regulations are required since the blockchain system uses digital currency. This regulatory framework prevents money laundering, fraud, and other financial crimes. The rules must be updated as the system evolves to keep pace, ensuring their relevance and practicality. In conclusion, the regulation of blockchain in the banking sector is not just necessary; it is a shield that promotes the responsible and ethical use of technology, protects user data, regulates the use of digital currency, and keeps up with the evolving system, offering a promising future.

As outlined above, blockchain technology has significant theoretical implications in the banking industry, particularly in improving shareholders' net worth. Blockchain can automate and streamline processes, reducing the need for intermediaries. This can lead to significant cost savings, increasing the net profit margin of banks, thereby increasing the shareholders' net worth. Blockchain's immutable and transparent nature can increase trust among stakeholders. This can attract more investors, expanding the bank's capital and, consequently, the shareholders' net worth. Blockchain's decentralized and encrypted nature makes it highly secure against fraud and cyber-attacks. This can reduce the costs associated with such incidents, further increasing the net profit margin. Blockchain can enable new business models like decentralized finance (DeFi), creating new revenue streams for banks. This can increase overall profitability and shareholders' net worth.

The results of this study improve the understanding of shareholder value in several ways: It provides insights into the disruptive, transformational nature of blockchain technology in the traditional banking space. It sheds light on how blockchain creates shareholder value by increasing efficiency, transparency, and security and enabling new business models. It provides insight into how blockchain can be used as a strategic technology to build shareholders' net worth. It contributes to corporate governance and responsibility discourse in the digital transformation era. It provides a warning to the banking industry that it must understand the limitations of blockchain technology and how they can affect shareholder value.

In conclusion, blockchain technology has the potential to impact the banking sector significantly. Blockchain technology could enable banks to establish new services, streamline cross-border payment processes, issue digital currencies, create DAOs, and implement smart contracts. Banks like JPMorgan Chase and Goldman Sachs underscore the industry's commitment to innovation, further highlighting the promising future of blockchain technology in the banking industry. Blockchain technology can revolutionize banking by replacing intermediaries with a decentralized network. This enhances trust, reduces costs, and increases transparency. It expedites processes, enhances security, and streamlines banking activities. In summary, it offers advantages such as increased transparency, enhanced security, and efficiency gains, potentially transforming the industry.

The potential impact of blockchain on the banking sector is significant, with participants emphasizing its influence on customer behavior, capital needs, earnings, and overall industry disruption (P98 & P101). The consensus is one of cautious optimism, underlining the need for strategic planning, investment, and foresight in navigating the potential impact of blockchain on the future of banking. Moreover, the integration of blockchain technology in banking operations

presents notable challenges, encompassing processing speed, transaction volume, transparency, privacy, integration, legal framework, smart contracts, security, trust, and regulatory and communication hurdles. These barriers directly affect scalability, operational costs, transaction durations, and the uncertain regulatory environment, potentially impeding the widespread acceptance of blockchain technology within the banking sector.

Theoretical Implications

The study's Application to Professional Practice section underscores the real-world implications of the research findings. Blockchain initiatives impact value, cost, and performance, as well as the potential positive influence of these factors on stockholders' capital post-adoption. Drawing on data from the Federal Reserve Board of Governors, scholarly literature, and structured interviews, the study suggests that blockchain technology holds promise for the financial industry, particularly in enhancing stability and security within the economic system. However, before leveraging blockchain for cost reduction and increased retained earnings, specific issues must be addressed, including acceptance and trust, regulatory hurdles, volatility, privacy, scalability, and integration.

By examining the long-term effects of income statements, value accumulation, performance, product suitability, and constraints on shareholders' net worth, the research fulfills its objective of conducting fundamental research into the banking sector. The study's conclusions offer actionable insights applicable to banks of all sizes, specifically focusing on maximizing shareholder value through blockchain technology. This strategic approach mitigates the challenges of meticulous planning and strategy, carefully considering the most suitable blockchain platform for the organization, aligning with its needs and constraints, and ensuring the availability of requisite resources such as tools and expertise.

As discussed in the study by Garg et al. (2021), the implementation of blockchain technology by banks should prioritize identifying specific use cases for the technology. This involves meticulous research and consideration of various applications such as cross-border payments, fraud prevention, smart contracts, and identity verification. Understanding how blockchain can enhance existing systems and identifying potential challenges is crucial, as the suitability of blockchain platforms varies, requiring in-depth evaluation and proof of concept. Adoption entails significant effort, including integration with existing systems, staff training, and recruitment of blockchain technology experts. Ongoing performance assessment and system optimization may be necessary to ensure the technology aligns with its intended objectives. Implementing blockchain technology demands careful handling, significant planning, and financial investment.

The researcher provided an overview of blockchain technology's importance in the banking industry. The researcher identified that data from various sources, including bankers, the Federal Reserve Board of Governors, scholarly literature, and semi-structured interviews, were used to highlight blockchain technology's promise to shareholders' net worth. The researcher accomplished this by providing the real-world implications of the research findings, including the impact of blockchain initiatives on value, cost, and performance. The perspective is based on the potential positive influence of blockchain on stockholders' capital post-adoption.

The researcher then delves into the challenges and considerations of leveraging blockchain, including acceptance and trust, regulatory hurdles, volatility, privacy, scalability, and integration. Additionally, the researcher examined the long-term effects of blockchain technology in the banking sector, looking at income statements, value accumulation, performance, product suitability, and constraints on shareholders' net worth. The researcher

emphasized that the objective is based on conducting fundamental research into the banking sector, providing actionable insights applicable to banks of all sizes. This was accomplished by focusing on maximizing shareholder value through blockchain technology. The research suggests banks should mitigate challenges through meticulous planning and thorough strategic considerations. The researcher also underlines the importance of identifying the most suitable blockchain platform for the organization and ensuring the availability of requisite resources such as tools and expertise.

Moreover, the researcher's recommendations for banks to use case studies for blockchain technology, based on the study by Garg et al. (2021), are significant. This approach involves meticulous research, consideration of various applications, understanding how blockchain can enhance existing systems, and identifying potential challenges in adopting the technology. The researcher also addresses the effort and resources required for implementation and ongoing optimization. The researcher demonstrated the real-world implications of the findings, highlighting the effects of blockchain initiatives on value, cost, and performance, focusing on the positive influence on shareholders' capital post-adoption.

The researcher's focus on enhancing shareholder value through blockchain technology is vital to the study. The challenges and considerations associated with implementing blockchain, encompassing factors such as acceptance and trust, regulatory obstacles, volatility, privacy, scalability, and integration, were thoroughly examined. Furthermore, an in-depth analysis of the long-term effects of blockchain technology in the banking sector was presented, covering aspects such as income statements, value accrual, performance, product applicability, and constraints on shareholders' equity. The researcher's emphasis on the objective of fundamental research in the banking sector and the actionable insights applicable to banks of all sizes is clear. An integrated

strategic approach aiming to address challenges through meticulous planning and comprehensive strategic considerations was also highlighted, along with identifying the most suitable blockchain platform for the organization and ensuring the availability of the required resources and expertise.

Moreover, the researcher recommended that banks utilize case studies for blockchain technology based on the study by Garg et al. (2021). This recommendation involved detailed research, assessing various applications, understanding how blockchain can augment existing systems, and identifying potential adoption challenges. The researcher also addressed the efforts and resources necessary for implementation and ongoing optimization. Lastly, the researcher concluded by emphasizing the significance of blockchain in the financial industry, outlining the challenges and considerations in adopting blockchain, and advocating for meticulous planning and financial investment in blockchain implementation.

Summary

The results of this study improve the understanding of shareholder value in several ways: It provides insights into the disruptive, transformational nature of blockchain technology in the traditional banking space. It outlined that blockchain technology has significant implications in the banking industry, particularly in improving shareholders' net worth. Blockchain can assist with automating and streamlining processes, reducing the need for intermediaries, lowering expenditures, improving value, and creating new revenue streams. As outlined above, blockchain technology has significant theoretical implications for the banking industry, particularly in improving shareholders' net worth. In contrast, this research warns the banking industry that it must understand the limitations of blockchain technology and how they can affect shareholder value.

Recommendations for Further Study

The researcher strongly recommends conducting further studies to address the issues of regulation, scalability, and interoperability in the context of blockchain technology within the banking sector. Multiple studies may be carried out to achieve this goal. These investigations could lead to a deeper comprehension of this field of study. Finally, these studies can enhance the understanding of blockchain technology in banking, guiding future research and contributing to the ongoing development of blockchain technology in the banking sector.

A scalable research objective would be to improve the capacity of blockchain networks to handle large numbers of transactions per second (TPS). Performance benchmarking could be used to assess the TPS of different blockchain platforms and identify any bottlenecks. Additionally, the study could focus on understanding off-chain solutions like Plasma or the Lightning Network to enhance transactions. Furthermore, applying techniques to divide the blockchain into more manageable segments and investigating different consensus algorithms (such as Delegated Proof of Stake and Proof of Stake) could enhance scalability.

Another essential area for study is interoperability, which aims to enable different blockchain networks to communicate and operate seamlessly together. A study could explore cross-chain protocols such as Polkadot, Cosmos, and Atomic Swaps and standardization investigation to create industry standards for data formats and communication protocols. Additionally, research on middleware solutions could be conducted to analyze platforms that facilitate data transmission between blockchain systems.

Furthermore, research on regulatory subjects could determine if blockchain applications comply with current laws and influence the creation of new regulatory frameworks. This could include a study on compliance frameworks to understand how blockchain might fulfill legal

requirements like GDPR, AML, and KYC. Legal analysis could also be conducted to comprehend the legal implications of digital identities, tokenization, and smart contracts under existing legislation, as well as a study on policy recommendations to create new regulations that account for the unique features of blockchain technology. A risk assessment study could also consider cybersecurity concerns and other hazards related to blockchain implementation in banking.

Furthermore, future researchers should draw from case studies and pilot projects to provide real-world data and practical insights into blockchain implementation in banking. This includes evaluating blockchain technologies in a regulated setting, analyzing successful and unsuccessful blockchain initiatives in the banking industry, and assessing user experience with blockchain-based banking apps. Case studies and pilot projects can be used in research on blockchain deployment in banking to provide empirical data and valuable insights.

In conclusion, the urgency of addressing regulation, scalability, and interoperability concerning blockchain technology in the banking industry is highlighted, emphasizing the need for the recommended investigations. Overall, conducting the aforementioned investigations is crucial for addressing the urgent concerns of regulation, scalability, and interoperability in the banking industry's use of blockchain technology. These investigations could lead to a deeper comprehension of this field of study.

Reflections

Introductory

The researcher gained valuable experience from this research project that can provide a wealth of information. The information gathered for this study clarified the crucial need to understand specific costs, such as initial investment and ongoing maintenance, and constraints, such as regulatory compliance and data privacy, associated with using blockchain technology in the banking sector. The researcher benefited from the knowledge gained from earlier coursework. The Doctor of Administration program at Liberty University has equipped the researcher with the skills necessary for further study. It has made her aware of the significance of organizational culture initiatives and leadership's role in creating a positive work environment in manufacturing. The researcher's personal and professional development has been aided by the knowledge acquired during this investigation. All data collected for this research study can be applied to other case studies. Working on this dissertation project was an incredibly challenging yet gratifying experience for the researcher. All acquired skills and knowledge will be used for future development. Moreover, the researcher gained a better understanding of Biblical stewardship, emphasizing the ethical ramifications of financial technology, especially when considering blockchain in banking.

Personal & Professional Growth

As the research project progressed, myriad obstacles, such as data collection difficulties and time management issues, came to the forefront. However, these obstacles were not deterrents but opportunities for continuous improvement. For instance, the researcher's adeptness at balancing work and home life led to significant enhancements in her interviewing and research methods. The study candidate's observations and the researcher's ability to build rapport were particularly noteworthy. These findings, in turn, influenced the research that delved into blockchain technology projects and the net worth of bank shareholders.

Throughout the study, the researcher gained a profound understanding of the benefits and limitations of blockchain and banking. This understanding was primarily shaped by the insights shared by the interviewed bankers, who provided firsthand accounts of the challenges and opportunities associated with these technologies. The consistent evidence that emerged from these valuable insights underscores the importance of understanding the limitations and benefits of this technology before its implementation, a crucial step in ensuring its successful integration. Thanks to this study, the researcher feels more confident discussing blockchain technology and its impact on shareholders' net value. This confidence stems from the recently developed abilities and knowledge acquired by meticulously examining research participants' responses. For instance, the researcher's understanding of different operating systems and coding categories has significantly improved. This, coupled with the ability to transcribe research information to create the study, has made research data analysis feasible. The researcher's improved ability to articulate complex ideas and explain the research findings clearly and concisely underscores the importance and value of the qualitative approach.

The researcher's life will be impacted and enhanced by all the feelings and emotions she has encountered while conducting this research project. While working on this dissertation, the researcher has learned the value of time management, the necessity of solid willpower and attention, and how to give up significant time for work, family, religion, and school. The researcher has gained patience, perseverance, and mental toughness from this challenging journey. The researcher will use the invaluable knowledge and experiences she has collected throughout her personal and professional life. The researcher's writing and communication abilities have significantly improved.

Thanks to the comprehensive training provided by the Doctor of Business Administration program at Liberty University, the researcher's vocabulary and presentation skills have also seen marked improvements. This program has not only propelled the researcher's academic career but also bolstered her self-confidence, equipped her with advanced business methods, and provided the necessary resources to overcome any challenges that came her way. The program's emphasis on practical application and real-world problem-solving has been instrumental in the researcher's personal and professional growth.

Biblical Perspective

Biblical stewardship emphasizes the ethical ramifications of financial technology, especially when considering blockchain in banking. The Bible's tenets of stewardship—ownership, accountability, responsibility, ethics, honesty, and integrity—are not merely abstract ideas; they provide valuable guides for contemporary banking procedures. All things belong to God, according to the Bible. Psalm 24:1 says, "The earth is the Lord's, and everything in it, the world, and all who live in it." This idea suggests that rather than proprietors of the resources they oversee, people are stewards of them. Humans are stewards, and we must manage resources well. In the Parable of the Talents (Matthew 25:14–30), Jesus stresses the need for wise and prudent resource management. Stewards answer to God for their resource management. "Therefore, each of us will give an account of ourselves to God," reads Romans 14:12. Integrity and honesty are stressed in the Bible's writings. "The Lord detests dishonest scales, but accurate weights find favor with him," says Proverbs 11:1. The Bible emphasizes honesty and integrity in all dealings (Proverbs 11:1, Luke 16:10). Efficiency and Wise Use of Resources: According to Proverbs 21:5, good stewardship entails the prudent and efficient use of resources. Protection of the Vulnerable: According to Proverbs 31:8–9 and James 1:27, the Bible demands that everyone

be treated fairly and that the vulnerable be protected. Innovation and Creativity: Using our imagination and inventiveness to enhance and create novel solutions is another aspect of stewardship (Genesis 1:28).

Blockchain technology, when applied in banking, offers a wealth of practical benefits. It ensures accountability and ethical use, enhances efficiency and responsibility, and fosters transparency and trust. The immutability and transparency blockchain provide align with the integrity and honesty advocated in the Bible. By adopting blockchain, banks can ensure transparent and verifiable transactions, reducing fraud and instilling confidence. This technology also streamlines financial operations, a practice in line with biblical teachings on resource management. Effective systems demonstrate responsible stewardship by lowering expenses and enhancing service delivery. Because blockchain technology is decentralized, all transactions are recorded and cannot be changed. This offers a transparent and unalterable record of financial activities, consistent with the biblical concept of accountability. Ensuring that blockchain technology encourages justice, lessens corruption, and offers financial services to marginalized groups is all part of the ethical application of blockchain in banking. For example, blockchain can prevent money laundering by providing a transparent record of transactions, thereby promoting financial justice and integrity. Blockchain technology can improve honesty and integrity in banking by lowering fraud and guaranteeing that transactions are precisely recorded and verifiable thanks to its transparent and irreversible ledger. By automating transactions and removing the need for middlemen, blockchain can improve efficiency, save costs, and streamline banking procedures. The unbanked and underbanked can benefit from financial services provided by blockchain, which gives them access to safe and transparent financial systems.

Blockchain technology offers new methods for safely managing and transferring assets, making it a significant advance in the financial sector.

When viewed through a biblical worldview, the adoption of blockchain technology in banking aligns with the call for justice and care for the impoverished (Proverbs 31:8-9) and underscores the importance of responsible, ethical, and transparent management of financial resources. By integrating blockchain with these biblical principles, banks can demonstrate their commitment to advancing technologically while upholding values of integrity, accountability, and social responsibility. This not only positions the adoption of blockchain as a strategic move but also as a step toward a more ethical and responsible financial system where technology is harnessed for the greater good. In summary, a biblical approach to blockchain technology stewardship in banking would entail utilizing the technology to foster ideals and values consistent with biblical teachings while protecting the weak and innovative.

Summary

The researcher gained valuable experience from this research project that can provide a wealth of information. Upon reflection, the researcher found significant data that not only reaffirmed the impact of blockchain projects on value, cost, and performance but also highlighted the potential for these factors, when positively correlated after implementation, to increase the value of investors' capital significantly. The researcher learned that implementing blockchain technology requires substantial financial and planning resources. This underscores the urgency and necessity of strategic decision-making in the face of technological advancements, as it requires adapting and evolving. Moreover, the researcher learned that Biblical stewardship emphasizes the ethical ramifications of financial technology, especially when considering blockchain in banking.

Summary and Study Conclusions

Summary of the Entire Study

The research conducted a comprehensive analysis of the incorporation of blockchain technology in the banking sector, with a specific focus on its implications for shareholders' net worth. The study examined how adopting blockchain solutions can effectively control costs and optimize revenue, generating a bank's profitability after deducting all expenses, including taxes, from its total revenue. The resulting net profit is subsequently reflected as retained earnings on the balance sheet, symbolizing the accumulated net income that a company has retained rather than dividends to shareholders. Importantly, retained earnings constitute a significant portion of shareholders' equity. An increase in net income typically leads to a corresponding rise in retained earnings, strengthening shareholders' net worth and reinforcing a bank's fundamental financial stability through the accumulation of liquidity. Similarly, an increase in retained earnings leads to shareholder equity growth. Therefore, the study found that when incorporating new technologies, cost management and revenue enhancement are crucial factors, as maintaining profitability is directly linked to the financial robustness and stability of the banking industry.

This research integrated industry professionals' qualitative and quantitative data, emphasizing the research findings' practical applications and real-world significance. It underscored the potential impact of blockchain technology on the reliability of customers, regulators, and shareholders, intending to provide confidence regarding its potential benefits. The findings suggested that blockchain technology has the potential to improve banking operations by reducing transaction processing time and lowering fees paid to intermediaries. Additionally, the study emphasized the necessity for further research to evaluate the long-term effects of

regulation, scalability, and interoperability concerning blockchain technology in the banking sector.

Highlights of Key Areas and Key Results

The study proposed various strategies for banks to leverage blockchain technology to enhance operations, liquidity, and revenue streams. It highlighted the potential benefits of blockchain, such as improved transparency, faster settlements, increased trust, asset tokenization, smart contracts, decentralized finance (DeFi), reduced transaction fees, enhanced risk management, and improved data analytics. The study emphasized how blockchain technology can significantly transform banks' operations, offering security, decentralization, immutability, cost reduction, faster transactions, and increased transparency. Moreover, the study highlighted the limitations of blockchain technology in the banking industry, underscoring the need for further research to examine the long-term impacts of regulation, scalability, and interoperability concerning blockchain technology in the banking sector.

Moreover, the study outlined several aspects of blockchain technology in the banking industry, emphasizing scaling issues, slow transaction processing speeds, and storage problems associated with blockchain. It stressed the significance of interoperability in fostering cooperation and innovation within the blockchain ecosystem. The study also underscored the necessity of regulation in promoting the ethical and responsible use of blockchain technology in the banking sector. Additionally, it highlighted the potential benefits of blockchain technology in improving shareholders' net worth through cost savings, increased trust among stakeholders, enhanced security, and the creation of new revenue streams. This emphasis on the need for further research and regulation aims to convey the urgency of these actions in promoting the

ethical use of blockchain in banking, making the audience feel the pressing need for these measures.

The study underscored the importance of the banking industry comprehending blockchain's limitations and potential impact on shareholder value. It delved into the impact of blockchain technology on the banking sector, highlighting its potential to increase efficiency, transparency, and security and enable new business models. The potential for blockchain to revolutionize banking by replacing intermediaries with a decentralized network was also highlighted, with specific examples from banks like JPMorgan Chase and Goldman Sachs. The study underscored the substantial impact of blockchain on customer behavior, capital needs, earnings, and industry disruption while cautioning the need for strategic planning and investment to navigate these changes. Additionally, notable challenges in integrating blockchain technology in banking operations include processing speed, transaction volume, transparency, privacy, legal framework, security, trust, and regulatory hurdles. These challenges could influence scalability, operational costs, and industry-wide acceptance of blockchain technology.

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Appendix:

Interview Questions

Revenue/Expenses

Do you agree that blockchain has helped to decrease expenses in the banking industry and why or why not?

Do you agree that more CEOs are making strategic business decisions about blockchain activities to improve revenue? Why or why not?

Value

Do you agree that planned capital investments in the banking industry will yield an ROI of 10% or higher? Why or why not?

Do you agree banking shareholders are asking or engaging about blockchain strategy in the banking industry because it adds more value and why or why not?

Time

Do you agree that banking managers are focusing their resources more on blockchain activities now than they did over the last 5 years? Why or why not?

Do you agree that banks see the implementation of blockchain technology as a comparative advantage to grow market share? Why or why not?

Limitation

Do you agree the banking industry is facing barriers to greater investment in blockchain technology and why or why not?

Suitability

Do you agree that the banking industry understands the financial relevance of blockchain? Why or why not?

Do you agree that blockchain technology will disrupt the banking industry operations? What is your level of agreement or disagreement with this statement?

Efficiency

Do you agree that blockchain-based solutions are currently more secure or less expensive than conventional information systems? Why or why not?

Do you agree that blockchain has more financial advantages over existing systems in the banking industry? Why or why not?

Products

Do you agree that stablecoin will disrupt the banking industry. Why or why not?

Do you agree that ChatGPT, when combined with blockchain, will disrupt the banking industry? Why or why not?

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

April 9, 2024

O'Neal Barnett
Henry Kerich

Re: IRB Exemption - IRB-FY23-24-1447 Banks' Shareholder Net Worth and Blockchain Technology

Dear O'Neal Barnett, Henry Kerich,

The Liberty University Institutional Review Board (IRB) has reviewed your application per the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data-safeguarding methods described in your IRB application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:104(d):

Category 2.(iii). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by §46.111(a)(7).

For a PDF of your exemption letter, click on your study number in the My Studies card on your Cayuse dashboard. Next, click the Submissions bar beside the Study Details bar on the Study Details page. Finally, click Initial under Submission Type and choose the Letters tab toward the bottom of the Submission Details page. Your information sheet and final versions of your study documents, **which you must use to conduct your study,** can also be found on the same page under the Attachments tab.

This exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,
G. Michele Baker, PhD, CIP
Administrative Chair
Research Ethics Office