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Walden University

College of Social and Behavioral Sciences

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Samuel Addo Baidoo

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Walden University
2019

Abstract

Regulatory Effects on Traditional Financial Systems Versus Blockchain and Emerging

Financial Systems

by

Samuel Addo Baidoo

MBA, University of Maryland University College, 2012

BA, University of Ghana, 2002

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy Administration

Walden University

June 2019

Abstract

The expansion of the Internet led to disruptive business and consumer processes, as existing regulations do not cover the scope and scale of emerging financial technologies. Using organization economic theory as the foundation, the purpose of this correlational study was to examine and compare the financial regulatory impact on traditional and emerging financial systems across a variety of factors including organizational type, predicted users, operational concerns, reasons for cost increases, and changes in business practices as a result of the regulatory environment. Data were collected through a survey of 227 adult Americans who engage in the financial sector and are familiar with the US regulatory environment. Data were analyzed using descriptive statistics, cross tabulations, and statistical significance was tested using Lambda and Kendall's Tau c. The key finding of this study is that the effects of regulations are different for the traditional and emerging financial systems, showing the need to develop and implement policies that are context specific to the emerging financial systems. The recommendations from the study include suggestions to regulatory agencies to regulate and support emerging financial systems in line with new technology that envisions efficiency and economic fairness. The positive social change implications for this study include the development of a strategy that can ensure economic stability, reduce irregularities, and strengthen investments with a view of protecting the financial system from breakdown.

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Dedication

I am much grateful for the gift of life and the opportunity of higher education. I dedicate this doctorate to my parents and siblings, my wife Bernice, sons Jared, Kaden, and Zane. I am very grateful for your sacrifice. Job well done. I share this achievement with you all the dreamers in this life.

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Chapter 1: Introduction to the Study

Introduction

The evolution of technology impacts society, which necessitates understanding its positive and negative implications (Bussmann, 2017). The Internet has led to machine learning, predictive behavioral analytics, and data-driven decision-making as well as a new era of disruptive business and consumer processes (Itzhak & Stephanie, 2017). These innovations include the invention of cryptocurrencies, peer-to-peer lending and money transfers, mobile banking, mobile markets trading, and digital wallets (Bussmann, 2017). Technology has evolved to render cash economy as a dated endeavor (Lyman et al., 2008). For example, cryptocurrencies eliminate the need for financial intermediaries such as the banks to offer direct peer to peer monetary transactions (Peters et al., 2015). There is a need to explore how information from public agencies and partnering sectors are impacted by emerging financial sector innovations like blockchain and other financial technologies (Lyman et al., 2008). Thus, this study was conducted to examine the likelihood of regulations having the same impact on emerging innovative technologies in the financial sector as it has with the traditional financial systems.

Distributed ledger technology and blockchain provide essential and flexible processing power, tight security and high accuracy rates at considerably lower costs as opposed to traditional financial systems that are likely to be replaced by modern technologies (Cusa & Wilner, 2017; Iansiti & Karim, 2017). These technologies will, over time, replace existing accounting, settlement, and trading systems. However, like other new technologies, emerging financial technology poses regulatory problems for

customers and suppliers (Bussmann, 2017). It is essential for public policy administrators to consider the advantages and the disadvantages posed by these disruptors in the financial sector and work toward utilizing their new capabilities to foster a positive social change.

In the international financial system, blockchain technology and virtual currency are increasingly becoming important (Itzhak & Stephanie, 2017). Although these innovative technologies do not originate from a strong backing like a national project, they are steadily gaining legitimacy. Therefore, there is a need to conduct a comparative analysis to find out how regulatory and supervisory issues faced by the traditional financial systems translates to new financial technology. In this study, I employed organizational economic theory, which includes economic logic and methods applied to understand organizational makeup and performance (Davidson et al., 2016). The sections presented in this chapter include the background of the study, problem statement, purpose of the study, research questions and hypotheses, theoretical foundation, nature of the study, definitions, assumptions, scope and delimitations, limitations, and the significance of the study.

Background

Technological progress has significantly impacted society (Yoo, 2017). For centuries, technological innovations have evolved and had a different effect on society (Saint-Paul, 2008). One of the prevalent technical novelties in recent years is the Internet (Kakavand & Kost De Sevres, 2016). The Internet has facilitated several service deliveries and evolution in people's lifestyles. The Internet has influenced numerous

areas in modern societies, including manufacturing, information and communication technology, retailing, supply chain management and financial management (Itzhak & Stephanie, 2017; Bussmann, 2017; Saint-Paul, 2008). The Internet and mobile internet have also opened the way for new technologies like machine learning, predictive behavioral analytics, data-driven decision-making to bring about innovative businesses and consumer processes, and now a focus on artificial intelligence (Tapscott & Tapscott, 2016; Peters et al., 2015). Some of the innovations are cryptocurrencies, peer-to-peer lending and money transfers, mobile banking, mobile markets trading, digital wallets, and other business to clients and business to business technological advancements (Bussmann, 2017; Kakavand & Kost De Sevres, 2016; Kaye, 2014; Skinner, 2016; Tapscott & Tapscott, 2016; Peters et al., 2015).

Technological innovations (mobile banking and the Internet) have affected numerous sectors and areas in different ways (Peters et al., 2015; Bussmann, 2017; Kakavand & Kost De Sevres, 2016). One of the emerging technical innovations is blockchain technology. It is a method of offering registration of any type into a ledger, generally referred to as distributed database architecture (Pinna & Ruttenberg, 2016). Blockchain technology supports networks to be decentralized, shortening transaction times (Bussmann, 2017; Yoo, 2017; Kakavand & Kost De Sevres, 2016; Kaye, 2014; Itzhak & Stephanie, 2017; Peters et al., 2015; Skinner, 2016; Tapscott & Tapscott, 2016). Blockchain technology was created to decentralize transactional information and make it a lot harder to hack (De Filippi, 2016).

Further, the use of the Internet and mobile technology has evolved from e-money to more centralized and decentralized virtual currencies (Peters et al., 2015). These cryptocurrencies and virtual payments eliminate the need for financial intermediaries such as the banks to offer direct peer-to-peer monetary transactions. Significant examples are Bitcoin, Litecoin, Ethereum, and others such as Apple Pay, PayPal, Google wallet, Cash App, World Remit, GoFundMe, and many others (Bussmann, 2017; Kakavand & Kost De Sevres, 2016; Kaye, 2014; Skinner, 2016; Tapscott & Tapscott, 2016; Peters et al., 2015; Iansiti & Karim, 2017). Financial technologies allow for financial business operations like crowdfunding, wealth management, payment systems, among many others in the financial sector. Though the traditional currencies rely on intermediaries such as banks and security exchanges, virtual currencies are classified differently (Iansiti & Karim, 2017). For example, Backfeed is a platform originating from the double ledger and decentralized nature of blockchain technology (Davidson et al., 2016). The technology could be useful to government, private, and other businesses because it allows open source collaboration between centralized and decentralized platforms. Nonetheless, the decentralized nature of the blockchain technology makes it difficult to control and regulate the technology because there is no central administration (Brito & Castillo, 2014; Itzhak & Stephanie, 2017).

Emerging financial technologies, mobile banking, major digital currencies, and blockchain are fueling the development of the modern digital economy (Kakavand & Kost De Sevres, 2016). Distributed ledger technology, which is part of the latest trends in digital financial technologies, is distracting the financial service sector (Iansiti & Karim,

2017). Emerging markets are the ideal environment for the implementation of financial solutions based on blockchain technology because of lower bank entry threshold, the presence of greater digital financing, and higher banking risks. In the United States and other advanced economies, innovative financial technology products are explored in mitigating macroeconomic and business operational concerns as a result of general security and regulatory risks.

The blockchain and other financial technologies are relatively new, so there is a lack of adequate research conducted on the potential effects of full-scale regulation on blockchain and other emerging financial technology. This gap in research necessitates a study on the subject because stakeholders must adapt to a world of innovations that continue to change business processes, information management, security, investments, and business value amongst others (Au & Kauffman, 2008; Cusa & Wilner, 2017). Financial reports of 2008 have revealed that technological innovations offer various cost benefits of financial innovation, and the best means to engage in regulatory tax and regulatory arbitrage (Avgouleas, 2015). The current study involved comparison of regulatory effects on traditional financial systems to regulatory effects on blockchain and emerging financial technologies.

Financial industries such as banking, insurance, and microfinancing are looking for means to streamline their systems, reduce costs, and find new revenue streams (Yoo, 2017). To attain this goal, they are leveraging private and public blockchain platforms, and tokenized systems (Iansiti & Karim, 2017). Most financial institutions have indicated readiness to experiment with current blockchain technologies. However, the regulatory

environment is fluid and has not yet matured (Iansiti & Karim, 2017). The cost and complexity of doing business in the United States have been affected by increased regulations (Amadeo, 2018). In this study, a regulatory impact analysis was conducted to explore the influences of regulations on the new financial technologies in comparison with the resulting relationships with existing controlled financial systems (see Avgouleas, 2015; Battiston et al., 2016; Davidson et al., 2016; Yermack, 2017). In studying financial technologies to assess whether regulations like the traditional financial institutions will similarly influence them, I applied organizational economics theory to the statistical findings.

Problem Statement

The problem in regulating the entire financial sector is the lack of adequate and full-scale regulation of blockchains and other financial technologies. Federal financial regulations refer to national laws and legislation governing banks, insurance companies, and investment companies (Amadeo, 2018). Their role is to safeguard customers from fraudulent acts and financial risks. Financial regulation is some form of supervision in which financial institutions are subjected to certain restrictions, guidelines, and requirements (Murphy, 2015). The goal of monitoring is to maintain integrity within the entire financial system (Amel-Zadeh, Barth, & Landsman, 2017). The impacts of regulating innovative technology on governmental and nongovernmental organizations need to be addressed in the public policy and administration arena.

The financial sector has been conducting business electronically for years (Mülbert & Sajnovits, 2017). However, business transactions in the financial sector

involve numerous information transfers that are paper-based and done manually.

Financial institutions provide a variety of reasons to justify their continued practice of using conventional paper-based systems; regulatory statutes and aversion from customers affect the usage (Wilkins, 2016). But scholars propose that traditional financial systems move to the current digitalized environment (Belfo & Trigo, 2013; Itzhak & Stephanie, 2017).

The traditional financial system has struggled with issues that relate to the mechanics of organizational economic theory. They lack the diagnostic functionality to enable intelligence needs in transactions and speed up business operations (Mülbert & Sajnovits, 2017) and also lack real-time information (Saint-Paul, 2008). Other problems include inconsistencies in reports distributed, delays, errors in reports created, security risks, generally accepted accounting principles concerns, audit costs, reduced productivity and compliance risk (Genberg, 2008; Wilkins, 2016). Financial companies have to augment their financial processes and systems with costly add-on transaction reporting solutions to get required actionable information (Wilkins, 2016). Consequently, this prevents management's capacity to apply knowledge and leadership skills fully toward supporting financial planning and forecasting activities.

With the execution of new technologies, there may be possible significant impacts and unintended consequences (Mülbert & Sajnovits, 2017). It is crucial that no innovations or practices interfere with the financial industry's core functions that expose it to avoidable risks. Additionally, this sector requires further development and tightened regulatory oversight, especially after the financial crisis of 2008 (Olivero, Li, & Jeon,

2011). Blockchain technology is one potential solution for addressing the problem of the shift in financial technology (Wilkins, 2016) and it has a high potential in modern society (Yoo, 2017). However, this technology is still in its early developmental stages, whereas the traditional financial sector operates on regulated and dependent systems (Mülbert & Sajnovits, 2017). Unlike traditional financial systems, most financial innovation makes it vital to ensure that the current regulatory environment does not negatively interfere with their operations (Saint-Paul, 2008). Given the context of uncertainty about blockchain and emerging financial technologies which present certain risks, organizations and markets may continue using traditional financial systems as they experiment with this new technology. New financial technologies are yet to be a controlled form of business because existing regulations and laws do not adequately cover their scope and scale (Bussmann, 2017).

The question of interest in this investigation is how financial regulations affect blockchain and other financial technologies compared to traditional financial systems. The full implementation of the financial innovations and blockchain technology is likely to take longer than anticipated, given that it requires several modifications to support extensive implementation (Van de Velde et al., 2016). Another issue of interest is how the existing laws influence the established market share of traditional financial systems. This effect on the traditional financial systems may not be the same as the core functions of the newer and emerging financial technologies. In this study, I explored the potential impact of full-scale regulation of the new financial technologies to find solutions to this

public policy administration shortfall. This research may also address the lack of research on the full-scale regulation of blockchain and emerging financial technology.

Purpose of the Study

The purpose of this quantitative study was to examine how regulatory constraints impact new and emerging financial systems compared to the regulatory effects on traditional financial systems. Additionally, I wanted to evaluate the regulatory framework of blockchain and other emerging financial technologies in comparison with traditional financial methods and systems. The objective was to provide new knowledge on regulatory challenges that can be anticipated by emerging financial systems. A comparative analysis of regulatory effects with traditional financial systems can help understand how financial regulation by policy administrators will be efficient regarding emerging financial systems.

The issues explored in this research are regulations that impact financial systems, the lack of adequate regulations, the competitive advantage of the new financial technology over the controlled financial systems, and a comparative analysis after effective laws are put in place. Organizational economics theory was the framework for this study. The framework incorporates the use of economic logic and methods that are applied to understanding organizational makeup and performance (Davidson et al., 2016). Regulatory impacts on organizations are identifiable in areas such as organizational composition, structure, performance metrics, and profitability (Amadeo, 2018).

The latest innovative technology, blockchain, can disrupt the existing business models and economic models (Yoo, 2017). Emerging markets can also benefit from this

technology. As the potential for blockchain technology impact increases, the regulatory element remains a barrier (Bussmann, 2017; McKinlay, Pithouse, McGonagle, & Sanders, 2018). This challenge requires a model to evaluate the way blockchain technology can be implemented and deployed. Currently, not many studies have explored the influence of blockchain and other emerging financial technology on businesses and society. Thus, I explored the influence of blockchain and other emerging financial technology on businesses and how regulating them can encourage or discourage a positive social change. Financial systems have become even more sophisticated because of new financial technologies, which requires regulatory bodies for covering the scope and scale of the entire sector and to mitigate risks. Public policy and administrative measures can provide and enforce required financial sector rules and regulations, which can ensure economic growth as well as economic stability.

The assessment of financial technologies in this study provides information and data for regulators and public administrators to consider in decision-making that influences the livelihoods of most members of society. The organizational economics theory makes such an assessment useful to businesses and the nation because it will help apply economic logic and methods to understanding organizational makeup and performance (Davidson et al., 2016). Policy makers will have insights on applicable regulatory effects on businesses and institutions such as impacts on organizational composition, structure choices, performance metrics, and profitability.

Research Questions and Hypotheses

I examined current regulations underlying blockchain technology and what is referred to as financial technologies or emerging financial technologies. These new financial sector technologies have necessitated the need for public policy administrators to intervene with adequate regulations. The current effects of regulation on traditional financial systems are compared to potential full-scale regulatory effects on blockchains and emerging financial systems. A comparative analysis is conducted to evaluate the effects of regulations on both systems based on surveyed data on the traditional systems and the emerging systems. To address this topic, the following are the research question and hypotheses:

Research Question: How do regulatory effects on traditional financial systems compare to regulatory effects on blockchain and emerging financial systems?

H_0 : Regulations will not have the same effects on blockchain and emerging financial systems as it did with traditional financial systems.

H_1 : Regulations will have the same effects on blockchain and emerging financial systems as they did with traditional financial systems.

The dependent variable is regulatory effects, and the independent variables are emerging financial systems and traditional financial systems. The primary research question helped to understand the effects of regulation on traditional financial systems and the potential effects of similar regulations on blockchain and emerging financial systems. Regarding the null hypothesis, to date, there are no industry standards for blockchain and emerging financial technology. The lack of standards warranted

analyzing the present regulatory method applied to blockchain and emerging technology in the financial service sector, especially in comparison to controlled financial systems. The alternative hypothesis was focused on the level of influence current regulations have on traditional financial systems and whether like regulations are comparable to blockchain and other emerging financial technology.

Theoretical Foundation

The theoretical framework for this study was the organizational economics theory. This framework encompasses economic logic and methods that are applied to understanding organizational makeup and performance (Davidson et al., 2016). Organizational economics helps in the development of the resources of businesses and institutions to bring them to a level where risks are mitigated with insights from research. Human, capital, technology, and other strategic risks are analyzed for management to make informed decisions. In exploring the existence, nature, design, and performance of institutions, policy makers can use regulations to influence positive social change to benefit society.

Some of the fundamental themes that affect the regulation of financial systems are about costs, price structure, and patent or property rights. When it comes to the financial systems industry, organizational economics theory is relied on to build stability and trust. The new and emerging financial technology systems are less reliant on traditional theories because they are interested in efficiency and customer satisfaction versus established processes. Decision-makers use the insights from organizational economics

theory to create businesses but are not much focused on just building up organizations (Davidson et al., 2016).

Significant areas of the financial sector affected by organizational economics theory include fair taxation, identity management, and privacy. Available observations are that taxing income generated through virtual currency transactions is challenging because of variations in sovereignty laws. Privacy, security, and usability of data/information are at the center of any data-driven world. Data used in financial transactions, traffic, marketing data, government, health, logistics, typical end-user applications, defines and necessitates suitable identity management systems (Dunphy & Petitcolas, 2018). Privacy regulation impact traditional financial systems and new technologies differently (Lazaro & Le Metayer, 2015); for example, one significant issue with a broadcast blockchain is lack of privacy regarding the shared data.

The elements to test in organizational economics theory are transactional cost theory, agency theory, and contract theory. Transactional cost theory covers the expense of government in effectively regulating the financial sector. Agency theory is used to examine the appropriate timing of government intervention and how that might be orchestrated. It also involves inquiring why governments choose to intervene through regulations. Contract theory is used to explore one of the critical features of government: the centralization of spending in an economy. The traditional financial systems are centralized and controlled, but the blockchain and financial technologies are focused on being decentralized. Thus, there is a need to compare impacts surrounding the challenges of regulating centralized and decentralized systems.

Nature of the Study

I used a quantitative approach in this study. By conducting this investigative research, I explored the effects of regulations on new financial technologies and traditional financial systems through statistical tests and analyses. Blockchain technology, focusing on using Bitcoin, gained momentum in 2008 (Bussmann, 2017; Yoo, 2017). Given that its regulatory framework is still under development, further research into the effects of the regulations already implemented to guide this technology is necessary. For this study, I compared surveyed information on regulatory effects on existing traditional financial systems with surveyed information about the potential impact of adequate regulation on blockchain and emerging financial technologies.

Quantitative research is concentrated on quantifying data about a phenomenon of interest and summing it up for evaluations and analysis (Yilmaz, 2013). I used a survey to examine the financial service technologies that are increasingly disrupting the structured economy. The surveys were modeled after similar research about the regulatory impact on the economy by Chamber of Commerce's Center for Capital Market Competitiveness in "Financial Growth: The Impact of Financial Regulation" (U.S. Chamber of Commerce, 2016). The exploration of emerging technologies was geared toward providing a deeper understanding of the prospects of emerging financial technologies and the corresponding impacts of an adequate regulatory environment. I used effect statistics to determine the relationship between the possible effects of regulations on the new and emerging financial technology and that of the effects on the traditional financial systems which are already controlled by regulations.

In ensuring credibility and trust, quantitative research often includes investigating variables and recommended strategies to guarantee validity and reliability. The research method for this study is a correlational study, and the statistical technique included cross-tabulations and frequency distributions using the Lambda and Kendall's Tau c test to analyze the results of the data. The target audience of this research are individuals and institutions attempting to understand better the emerging financial technology and how they can be regulated to improve stakeholder interests, customer experiences, and to serve the financial marketplace while making positive social change in society.

The identified variables to test for were regulatory impacts on emerging financial technologies and traditional financial systems. The dependent variable was the regulatory impact, and the independent variables were the emerging financial technologies and traditional financial systems. Elements of organizational economics theory were applied in analyzing the variables to help answer the research question and hypotheses.

Definitions of Terms

Blockchain: A leading software platform in the world, for digital assets. It offers the production of blockchain technology for building better financial systems (Yoo, 2017). In a blockchain, records are linked and secured through cryptography. As such, data cannot be modified.

Emerging technologies: Technologies perceived as able to change or challenge the status quo. The essential characteristics are a noticeable impact, relatively fast growth, disruptive, radical novelty, scrutiny, uncertainty, coherence, and ambiguity. The

standard examples are smart devices, cloud computing, Internet-of-Things, crypto (digital) currencies, and blockchain (Au & Kauffman, 2008).

Financial regulation: Supervision in which financial institutions are subjected to certain restrictions, guidelines, and requirements. The objective of supervision is to maintain integrity within the financial system (Prabhakar, 2013). Nongovernment organizations, as well as governments, play the supervisory role.

Financial system: A system that permits the exchange of funds. The exchange can occur between investors, borrowers, and lenders. The system may operate at the firm-specific, national or global levels. The system also includes multifaceted and closely related markets, institutions, and services intended to link investors to borrowers efficiently (Au & Kauffman, 2008)

Financial technology: Any section where technology is used in financial services. Companies use this technology to manage the financial components of their businesses. They include business models, processes, and new software. New solutions brought about by these technologies increase inclusiveness and efficiency in financial services (Cusa & Wilner, 2017).

Market share: A percentage of the market which is controlled by a specified product, brand, or company. This measure shows the organization's size in the market it operates (De Filippi, 2016).

Regulations: Directives or rules made as well as maintained by the specific authority, mainly government agencies. Regulatory agencies formed to conduct the

provisions provided in the legislation, usually to enforce regulations (Khashanah & Miao, 2011).

Assumptions

- It was assumed that the inclusion criteria for the sample population in this study are appropriate. Thus, there is an assurance that all participants have experienced a similar phenomenon investigated, in this case, blockchain technology and or financial technology.
- It was assumed that study participants would be sincere in their interest to engage in this investigation. Employees may not agree to participate while their interest is to impress their chief executive officers or supervisors.
- All participants would answer questions included in the questionnaire candidly and honestly.
- The number of subjects/participants would be enough from which the researcher can sufficiently draw significant conclusions about the investigation findings.

Scope and Delimitations

I addressed the regulatory framework for blockchain technology and other emerging financial technology compared to traditional financial systems. The objective was to review the current regulations guiding blockchain and other financial technology implementation in a global context. I analyzed how emerging financial industries, including banking, adopt financial technologies. The study scope did not consider regulatory implementation plans for the companies.

Based on the research problem, I aimed to discuss potential impacts of regulations in blockchain and other financial technologies delimited to the financial sector. The interest of this investigation is on the financial market and how regulations introduced to safeguard the implementation of blockchain and other financial technologies affect this market. The regulations covering this technology might impact other markets and segments (such as the capital market). However, I investigated the financial market to get more in-depth knowledge and understanding.

The population studied was comprised of employees and business owners from the financial, technological, and regulatory industries. While studying blockchain technology and other financial technologies, game theory can be applied; however, I did not use it in this study. This study has potential generalizability in the financial sector. From the geographical viewpoint, the focus of this investigation was in the United States. Narrowing the region or the entire constituency that use blockchain and other financial technologies helps investigate a limited area to examine how their financial market is made up. European Union regional members were excluded, and the emerging markets were excluded.

Limitations

Blockchain technology and other financial technologies are new. Additionally, it embraces modern industries. Therefore, collecting empirical data from such an industry is challenging. Indicating and reaching a suitable focus group requires careful considerations. Data gathered for this reason may be biased because of the involvement of other industries other than the financial institutions. Further, there are unknown factors

or conditions within the participants' settings likely to influence their responses. For example, the facilities where respondents work or reside might bias their responses. Surveys were also collected online, which risked uncontrolled respondents and limits trustworthiness.

The Significance of the Study

The social sciences should include a focus on the advancement of technology and its impact on society and organizations (Bussmann, 2017). The significance of this study is rooted in the use of organizational economic theory to advance the need for public policy decisions to guide positive social change (Gibbons & Roberts, 2015). I analyzed the potential of regulation having a similar impact on emerging innovative financial technologies as it has with the traditional financial systems and institutions. Research on the regulatory impacts of the emerging financial systems is minimal. Thus, this research can make information available to regulators, stakeholders, and the public in adjusting to a world of financial, technological innovations (Au & Kauffman, 2008; Cusa & Wilner, 2017).

The 2008 financial crisis is a typical example of what can go wrong when financial regulations are lax in an economy (Khashanah & Miao, 2011). The use of technological innovations can help mitigate and avoid similar risks that come with an economy not having adequate and effective financial regulation (Avgouleas, 2015). Therefore, this research can encourage policy administrators to improve human or social conditions by providing information on the impact of financial regulations. Too much financial regulation can impede growth and block innovation. Lack of adequate

regulation can also lead to financial risks and downturns in the economy. The public agencies and partnering private sectors need to develop beneficial regulations for the new financial innovative systems (Lyman et al., 2008).

Significance to Theory

The study is significant in advancing the public finance elements of organizational economic theory. The framework of the theory includes transactional cost theory, agency theory, and contract theory (Ónday, 2016a). Organizational economics theory was created to focus on organizational structure, incentives, compensation, management decisions, risk management policies, and payment plans. This study adds research about emerging financial systems because the issues surrounding this technology is developing and relatively new. The goal was to uncover valid and credible findings that can serve as a valuable guide for public policy makers and corporate decision-makers to consider when making strategic decisions regarding financial technology.

I analyzed the transactional cost theory in government expenditure in regulating the financial sector. Insights gleaned can provide guidance on choices for direct and indirect costs and effects of government intervening in the sector. Agency theory is used to examine the influence of policy makers' decisions made for organizations, people, or companies. It includes the appropriate timing of government intervention and how that might be composed. In this study, the need for policy makers to intervene through financial regulations was considered. In contractual theory, the focus is on how the government can centralize contractual arrangements to provide oversight and the best cost value mechanics. With this study, there was an investigation into how policy

decision-makers can reconcile the decentralized nature of blockchain and similar financial technologies.

Significance to Practice

This study has potential contributions that advance practice and policy in the arena of the regulation of financial technology. The results of the study can help identify procedures to make financial policies equitable because policy makers will have evidence-based information. The identified influences will be analyzed regarding how they can affect businesses, organizations, governments, and members of the broader society (Yermack, 2017). Mapping the present research carried out on blockchain technology, for instance, may help practitioners and other researchers gain an improved understanding of contemporary research topics. Aside from bridging the gap in the study of emerging innovative financial technology, it helps to make information available to aid policy makers and all stakeholders in making beneficial decisions.

Additionally, the results obtained in this study may aid in assessing how innovative financial systems can compete with established economic institutions when full-scale regulation is available. Information on potential adequate and effective financial sector regulations will guide policymakers in deciding on how to adequately regulate blockchains and other financial technologies better to benefit the population, government agencies, the private industry, and all stakeholders.

Significance to Social Change

The study has implications for positive social change that are consistent with regulations in financial technology innovations. This research is geared toward

contributing information that can serve as guidelines and principles used in creating beneficial living conditions for the welfare of all communities. The adverse impacts of the 2008 financial crises and economic downturn is an example of the need for accurate, adequate, and effective financial sector regulations (Khashanah & Miao, 2011). The current study may inform and influence individuals, institutions, and regulators about emerging financial technology and how they can be regulated to improve stakeholder interests. The individuals, institutions, and governments affected adversely by the 2008 financial meltdown will be better protected with information and studies that positively influence regulations in the financial sector (Lyman et al., 2008).

Summary and Transition

This chapter presented the background information on blockchain and other financial technologies. Financial technology has the prospect to become a significant part of current business operations. It provides computing power, scalability, and security (Cusa & Wilner, 2017). Nonetheless, companies must address several issues, including regulations to realize fully the prospective benefits linked to this technology. Public policy makers and administrators are tasked with regulatory duties that will bring about a positive social change.

Chapter 2 presents a synthesis of the literature on blockchain technology and related regulatory issues. Chapter 3 presents the research design and methodology to conduct the current study. Chapter 4 presents the findings from the current study. Chapter 5 provides the recommendations and implications for social change and future research.

Chapter 2: Literature Review

Introduction

This research was focused on exploring the influence of blockchain and other emerging financial technology on businesses and society (Bussmann, 2017). The purpose of this quantitative study was to uncover the effects of regulatory constraints on new and emerging financial systems compared to the regulatory impact on traditional financial systems. Another goal was to provide an understanding of the lack of financial regulations to cover the scope and scale of blockchain and other emerging financial technologies. Surveys were used to collect data that were analyzed for this study (see Yilmaz, 2013). The innovative technologies examined include cryptocurrencies, peer-to-peer lending, money transfers, mobile banking, mobile markets trading, and digital wallets. The discoveries from the literature review provide current information on the regulatory environment of blockchain and other emerging financial technologies. This chapter includes an examination of the literature as well as the influence of blockchain and other emerging financial technologies along with the regulatory impact on new and traditional financial systems. The major sections of the chapter are the literature search strategy, theoretical foundation, traditional and emerging financial systems, related literature and resources, financial regulations, and the summary and conclusion.

Literature Search Strategy

Several databases were searched to compile the literature on this quantitative study about the effects of regulation on new and emerging financial systems compared to traditional financial systems. The research databases and scholarly resources used for the

literature review include Business Source Corporate Plus, Computers & Applied Sciences Complete, and ProQuest Central. Others are IT Source, which is a database that supports the career development needs of information technology professionals; Inspec, created by the Institution of Engineering and Technology; the National Technical Information Service, a database since 1964; the Science & Technology Collection database; and STM Source, which is an entirely full-text database explicitly designed for the needs of research and development. The bulk of literature gathered was limited to scholarly, peer-reviewed journals and articles. The main types of literature and sources searched include primary literature as well as current peer-reviewed literature. Sources found in the references sections of articles deemed relevant were further consulted. Literature gathered via Summon and Google Scholar allowed for review of some books related to this study. Articles searched and included the literature review were from 2005 to 2018.

Theoretical Foundation

Organizational Economics Theory

In applied economics, organizational economics involves studying transactions that take place within individual companies (Ónday, 2016a). Additionally, the theory addresses the way organizations perform and behave. It helps develop human resource management strategies in organizations, determining the way an organization should be organized, implementing key reward systems, assessing business risks and analyzing as well as improving management decisions (Ónday, 2016a). The theory also helps study transactions within a company versus transactions between different organizations (Ónday, 2016b). Organizational economics includes empirical and theoretical economic

techniques to examine the roles, performance, and nature of business firms (Gibbons & Roberts, 2015). The focus of organizational economics is on organizational structure, incentives, compensation, management decisions, risk management policies, and payment plans. The primary areas covered are agency theory, property rights theory, and transaction cost economics (Önday, 2016a, 2016b). Economic theory offers useful insights into emerging technology investigations in which business processes change regularly, and care is needed as far as information security, industry impact, business value, and investments are concerned (Au & Kauffman, 2008). In this study, organizational economics theory helped in learning the creation and development of financial institutions and how vital technological developments in these institutions affect growth.

Transaction Cost Theory

Transaction cost theory describes the costs included in organizing activities, especially related to communication, research of information, and bureaucracy. Transaction cost theory suggests that organizations and companies experience costs as they make a commercial trade in the given marketplace. In other words, people trade, and the practice costs money. Transaction costs are classified into three categories: search and information, policy and enforcement, and bargaining costs. Different transaction technologies result from different social arrangements following legal means established to safeguard intellectual rights (Önday, 2016b). In other words, a standard economic framework determines potential transaction opportunities.

Agency Theory

Agency theory is used to examine dilemmas that are influenced by decisions made for other entities. The theory is sometimes called the principal–agent approach. The theory is also used to examine the way problems arise due to disparities between economic players. According to Önday (2016a), agency theory explains the conflict between owners and self-interested managers when managers have considerable company control and owners have wealth effects. Agency theory is useful in examining the way problems arise due to disparities between major economic players; thus, this theory aligns with the current study’s purpose and problem statement.

Contract (Property Rights) Theory

Contract theory is focused on the construction of contractual arrangements. These arrangements, in most cases, are made with unbalanced information. Unbalanced information is when in the negotiation one person has more information compared to the other. Under this theory, organizational economics holds a similar accurate world model. Accordingly, payoffs, game structure, and strategies are shared knowledge (Önday, 2016a). In the current study, contract theory helped examine how financial institutions negotiate and construct contractual arrangements, comparing emerging financial technology with traditional financial systems.

The Contribution of Financial Markets and Systems

Financial markets have various functions (Olivero et al., 2011). In a financial market, individuals trade financial assets. Current financial markets include the capital market, forex market, and the money market. The money market handles liquid and

short-term securities or investments. The forex market involves the exchange of overseas currencies that consider the prevailing exchange rates (Olivero et al., 2011). The capital market deals with long-term securities and bonds.

The mortgage market, the bond market, and the stock market are financial markets regulated in the United States. Financial markets that function well are essential in improving economic growth (Murphy, 2015). In contrast, when the financial markets perform poorly, it leads to slow growth in the economy (Amel-Zadeh et al., 2017). Some of the important roles in the financial sector are financial risk management, allocation of funds to the most productive prospects to improve economic efficiency, mobilization of savings, transfer of payments and provision of loans to the borrowers. Collection of deposits made by savers is another important role in the sector (Amel-Zadeh et al., 2017; Olivero et al., 2011). Central banks also have a significant role in all financial systems across the globe. In the United States, the Federal Reserve plays the role of a central bank (Murphy, 2015). Its primary responsibility is to offer economic stability and growth. As government agencies, central banks guide monetary policy conduct. They manage the money supply and interest rates.

Research on banking regulation demonstrates that most institutions highly regulated among all financial systems are banks (Olivero et al., 2011). Bank regulations are designed to protect the interests of the public, primarily. Regulation protects the safety of the savings made by the public because banks act as lenders (Murphy, 2015), and it helps control credit and money supply to realize the broader economic goals of the country, counting low inflation and high unemployment. Banks in America can create

money as readily spendable deposits through credit extension. Regulation of banks offers the government various services, counting credit and tax revenues (Olivero et al., 2011). The intense competition among financial services guarantees quality and quantity of services as well as reasonable prices to the public (Olivero et al., 2011), so regulation in banks also helps various economic sectors with special credit needs, including agriculture, housing, and small businesses. However, regulation must be limited and balanced (Murphy, 2015). The balance helps to ensure that banks develop new services demanded by the public. With balanced regulation of banks and other financial institutions, decisions by the private sector cannot be distorted such that there is wastage or misallocation of scarce resources.

Financial Regulations in the United States

During the 2008 global financial crisis, the United States had a sophisticated financial ecosystem (Murphy, 2015). Banks largely contributed to financial freedom. Nonetheless, banks interplayed with markets and nonbanks, which collectively offered more than half of the country's financial services, including credit facilities (Khashanah & Miao, 2011). This financial system used complicated markets and instruments that had been developed over many years (Laux & Rauter, 2016). The global crisis mounted pressure on the United States, revealing various deficiencies in the American financial system (Khashanah & Miao, 2011). Consequently, the United States reacted by enacting various laws and regulations to address specific financial problems.

In the United States, financial regulation serves various aims (Scanlan, 2006). Financial regulators first seek to increase market confidence. Therefore, the objective is

to maintain confidentiality within the whole American financial system (Laux & Rauter, 2016). Second, financial regulators aim to promote financial stability. This aim involves contributing to the safeguard and improvement of financial systems stability. Lastly, financial regulations promote consumer protection (Murphy, 2015). The objective here is to secure the proper safeguard for the customers.

The early financial system in America was created by Hamilton (Scanlan, 2006). This system continued to operate for decades. However, the U.S. regulatory system was changed following the 2008 financial crisis (Khashanah & Miao, 2011; Laux & Rauter, 2016) where the country adopted a rigorous regulatory system (Murphy, 2015). The government makes different efforts to ensure it addresses various liquidity crises. Some recent financial regulations include Basel III, SIFI Regulations, the Securities and Exchange Commission Money Market Fund Reforms, The Volker Rule, Liquidity Coverage Ratio, and Derivative Rules for the United States and European Union (Khashanah & Miao, 2011).

Acts and Legislation on Financial Regulation

There are various laws on financial regulation in the United States. One of the earliest legislations enacted to guide financial regulation was the Glass-Steagall Act (Kregel, 2010), but Congress repealed the Glass-Steagall Act in 1999. Following the repeal, there was an extensive discussion among the economists and policy makers on negative and positive changes to consumers and businesses. The repeal certified commercial banks to invest in hedge funds and derivatives. Additionally, it permitted investment banks to take deposits. The repeal signaled a change toward enabling the

financial market to control itself (Kregel, 2010). Consequently, companies such as Citigroup invested in the credit default swaps. During the 2008 crisis, the organizations needed billions of bailout funds.

In 2002, the Sarbanes-Oxley Act was enacted by Congress (Piotroski & Srinivasan, 2008). The Sarbanes-Oxley Act was a supervisory response to the corporate scandals on accounting frauds reported at Enron, Arthur Anderson, and WorldCom (Prawitt, Sharp & Wood, 2012). Under Sarbanes-Oxley, top executives were required to verify corporate accounts (Shakespeare, 2008). These executives could then face criminal penalties in case fraud was exposed (Piotroski & Srinivasan, 2008). Many institutions and business organizations were afraid that this regulation would prevent qualified managers from pursuing top positions. However, as a federal law, the Sarbanes-Oxley Act set newer and expanded requirements for public accounting companies, public company management, and boards (Shakespeare, 2008). The act also has provisions for privately held companies. The act addressed responsibilities for the board of directors in public corporations and expands the criminal punishments for some specified misconduct (Prawitt, Sharp, & Wood, 2012). The Securities and Exchange Commission can create regulations defining compliance with the law among public corporations (Shakespeare, 2008).

In 2010, bank reforms were pushed by Congressman Barney Frank and Senator Frank Dodd (Barth & John, 2010). Barack Obama signed the Dodd-Frank Wall Street Reform Act into law in 2010. Under the act, banks are required to increase their capital cushion (Martin, Aaron & Justin, 2017). The act gives the Federal Reserve power to

annul large banks so that they do not become too big to fail. It removes the gaps for hedge funds, mortgage brokers, and derivatives (Barth & John, 2010). Wall Street banks are not allowed to own hedge funds or use funds from investors to trade derivatives so that they can make a profit. The Dodd-Frank Act also helped establish a Consumer Financial Protection Agency, which operates under the U.S. Treasury Department (Martin, Aaron & Justin, 2017). Therefore, states have the right to regulate banks and overrule federal regulations to protect the public. The agency recommends a self-governing agency with the power to review systematic risks that affect the whole financial industry. Thus, it reduces administrative pay as it gives owners a nonbinding vote (Barth & John, 2010). The Consumer Financial Protection Agency was initially proposed in 2009; however, the bank lobby prohibited it. The Dodd-Frank Act has eight elements designed to avert a devastating economic crisis like in 2008 (Martin, Aaron, & Justin, 2017).

The U.S. Regulatory System and How it Affects Financial Markets and Institutions

Regulatory authorities and agencies in the United States have various jurisdictions that play different roles (Amel-Zadeh, Barth, & Landsman, 2017). The Securities and Exchange Commission oversees the U.S. securities markets and publicly held companies, enforces and implements securities legislation, monitors exchanges for securities options and stocks (Kasperkevic, 2018). As a regulatory system, it helps promote transparency within the securities market, thereby protecting the investors against corporate malfeasance and fraud (Murphy, 2015).

Another regulatory system is the department of treasury. The U.S. Department of Treasury manages government revenues. Thus, the department recommends various fiscal policies to the executive and the legislative branch, regulating both the exports and imports (Murphy, 2015). The department is responsible for designing and printing all American paper currencies using the Bureau of Engraving and Printing, as well as minting coins in circulation using the United States Mint. The department also gathers all federal tax revenues via the Internal Revenue Service and manages licenses and debt instruments.

The Federal Reserve system regulates various institutions. These institutions include financial holding companies, bank holding companies, loan holding companies, and securities holding companies under the Financial Stability Oversight Council. The Federal Reserve regulates American banks and formulates the nation's monetary policy. The goal is to regulate economic growth and economic stability. The reserve has powers to shut down institutions posing a significant threat to American financial stability.

The National Credit Union Administration is responsible for regulating credit unions. The National Credit Union Administration is also responsible for chartering, regulating, and supervising all federal credit unions. The administration ensures the savings in state-chartered and federally chartered unions via the National Credit Union Share Insurance Fund. By managing the National Credit Union Share Insurance Fund, the National Credit Union Administration insures deposits above 111 million belonging to account holders in federal credit unions (Kasperkevic, 2018).

The Office of the Comptroller of the Currency supervises all federal savings associations and national banks. Significant institutions regulated by the Office of the Comptroller of the Currency include federally chartered economy institutions and national banks ((Murphy, 2015). The Federal Deposit Insurance Corporation is responsible for ensuring money deposited with the American banks (Kasperkevic, 2018).

There are also regulators responsible for regulating state banks (Murphy, 2015). Federal authorities, as well as a state authority, can regulate state-chartered banks. Various agencies are responsible for investor consumer protection (Kasperkevic, 2018). The Commodity Futures Trading Commission oversees the spinoffs and futures markets; thus, it helps to project future trading.

Lastly, the Consumer Financial Protection Bureau regulates financial products and services consumed by Americans. It regulates various bodies, including private student lenders, nonbank mortgage-related organizations, and payday lenders (Murphy, 2015). The bureau is responsible for creating laws that guide federal consumer financial protection. Nonetheless, the bureau does not supervise the Securities and Exchange Commission registrants, Commodity Futures Trading Commission registrants, insurers, real estate brokers, and sellers dealing with nonfinancial goods.

Regulatory Effects on American Traditional Financial Systems

Regulation on American financial institutions have various effects (Amel-Zadeh, Barth & Landsman, 2017). Financial regulations have influenced the structure and organization of the banking sector. The regulations have increased the range of available financial products. According to Tarashev and von Peter (2013), borrowers from large

corporations have access directly to the credit markets than ever. Benchmark bonds and corporate bonds have a low-interest rate. As such, most investors are searching for more products by extending the credit on looser terms to organizations in riskier markets (Khashanah & Miao, 2011).

Regulation usually blocks the entry of new institutions into the highly regulated industry (Khashanah & Miao, 2011). According to Caruana (2015), financial regulators repaired the deficiencies in the financial system affected by global financial crises. Financial regulators monitor the changing markets and economic risks (Amadeo, 2018). When regulations are implemented consistently, new entrants that cannot comply with the legislation find it burdensome to enter the financial markets.

Regulation may promote customer confidence in the financial system. This increase creates improved customer loyalty to financial institutions (Amel-Zadeh, Barth & Landsman, 2017). Financial institutions and markets affect the kind of goods or services produced within the given economy, entails the movement of money in large quantities, and affect profits. With proper regulations, customer confidence can increase.

Regulation shelters organizations from changes in cost and demand while reducing financial risks. The variety of assets held restricts banks in the United States. The reason for the regulation is that banks are the most significant financial intermediaries in United States (Acharya & Ryan, 2016). Other financial intermediaries include savings and loan associations, pension funds, finance companies, mutual funds, credit unions, insurance companies, and mutual savings banks. Since these intermediaries

serve as middlemen, regulations are not stiff compared to banks (Khashanah & Miao, 2011). Thus, they promote a dynamic and efficient economy.

Pros and Cons

The U.S. financial system has some structural characteristics which lead to effectiveness and efficiency within financial institutions and markets (Khashanah & Miao, 2011; Laux & Rauter, 2016). In any country, the market structure comprises of the financial intermediations, financial markets (bond or stock markets) and financial institutions. The American financial market comprises of intermediation, auction market, organized exchange (e.g., New York Stock Exchange) and over the counter market. Flexible trading is realized through over the counter market (Khashanah & Miao, 2011). As such, funds can be transferred to citizens in other countries.

Investors in America have a variety of investments which suit their tax status, risk preferences, and desired liquidity (Acharya & Ryan, 2016). Most commonly used financial institutions are insurance companies, banks, finance companies, investment banks, and mutual funds (Laux & Rauter, 2016). Financial intermediaries lend loans to borrowers. The government regulates these institutions to maintain efficiency. With various regulatory agencies, the US government ensures the smooth running of all financial institutions and financial markets.

Financial systems are naturally complex. Financial risks keep on changing each day (The Economist, 2012). The regulations must also evolve to ensure the public is protected against fraud. The various regulators and risk managers, thus, need to respect

the limitations of their understanding concerning financial regulations despite their sophistication.

The financial regulators in America are sometimes disorganized, decentralized, and redundant (Khashanah & Miao, 2011). For instance, the treasury has agencies including Financial Crimes Enforcement Network and the Office of Foreign Assets Control, both acting in similar roles. Additionally, financial markets and related institutions are susceptible to prosecutions, litigation, and investigations enforced by the department of justice (The Economist, 2012). Consequently, legislation and procedures that govern financial firms are frequently ineffective in regulating fair practices while upholding justice (Khashanah & Miao, 2011).

There has been a structural evolution of the financial system in America (Khashanah & Miao, 2011). The current financial system in the United States, however, is highly regulated (Laux & Rauter, 2016). The American government regulates financial markets to enhance information delivery and guarantee stability in its financial system (Acharya & Ryan, 2016). There is a need for efficient regulation so that the public can have confidence in American financial markets and institutions.

The American legal system has inefficiencies concerning financial marketing regulation (Khashanah & Miao, 2011). Debt defaults increase drastically, and interest rates become more volatile due to uncertainties in the economy (Acharya & Ryan, 2016). Therefore, regulators are required to use tools and techniques to assess such risks and deduce the strategies for reducing these risks.

Emerging Financial Technologies

Currently, technological changes or advancements play a direct role in the disruption which financial technologies are causing in the financial sector (di Castri & Plaitakis, 2017; Schueffel, 2017). Most financial institutions, prioritized disruption in their business strategy (De Filippi & Hassan, 2016). By 2020, scholars predict that financial institutions project that one unbeatable part of their processes will be blockchain (Holotiuk, Pisani & Moormann, 2017). This finding illustrates how disruption has been witnessed across the financial industry because of new technology advents. In efforts to remain relevant, Financial institutions are increasing collaboration initiations, especially with young start-ups.

Financial technology companies are currently bringing solutions to emerging markets, which increase inclusiveness and efficiency in financial services (di Castri & Plaitakis, 2017; Schueffel, 2017). The online marketplaces and mobile financial technology have altered how people trade and do business (Holotiuk, Pisani & Moormann, 2017). Currently, there are numerous peer to peer (P2P) platforms for service delivery, to sell, and to buy goods. Internet and mobile financial technologies have brought trading to the global level, reducing distance and time (Wright & De Filippi, 2015; De Filippi & Hassan, 2016). Financial technology has been a ticket for membership and financial inclusiveness in the current global digital economy (PwC Global, 2018).

Trade and business in today's world are facing various technology disruptions. This technology has expanded its usefulness and is evident in other sectors other than

trade (De Filippi & Hassan, 2016; Yli-Huumo, Ko, Choi, Park & Smolander, 2016). In commerce, this technology seems to have moved aside traditional platforms used for e-commerce and is being used to re-invent how contracts are established between parties.

PwC Global (2018) investigated the forces currently disrupting the structure, competitive environment, and role of financial institutions. Accordingly, the regulatory framework after the financial crisis has been settling into place gradually (Hwa, 2016). Consequently, the situation has forced financial institutions to modify their business models (Hwa, 2016). The speed of technological innovation is a creative and disruptive force impacting today's financial service ecosystem (De Filippi & Hassan, 2016).

Currently, the focus of research is on mobility. Statistics indicate that 25% of adults in America have a smartphone (Peters, Panayi & Chapelle, 2015). These users are increasingly using peer to peer payment apps each month (Tasca, Tomaso, Lorian & Nicolas, 2016). This population of users is undoubtedly significant. As such, start-ups have a higher chance of reshuffling the workings, paying more attention to the delivery of better mobility solutions (Au and Kauffman, 2008). Disruptive models are integrating mobility solutions in new technology trends. The problem, nonetheless, is the need for a regulatory model that can keep up with the development (Peters, Panayi & Chapelle, 2015).

Evolution of Financial Technologies

Financial technologies are used for online purchases, for example, google wallet, PayPal, and Apple Pay credit cards (Schueffel, 2017). Money exchange stakeholders, such as banks, e-commerce retailers, and customers, increasingly use financial

technology or FinTech (di Castri & Plaitakis, 2017). Financial technology is any field where technology is applied to help organizations manage financial business components. It includes new processes, business models, software, and applications. Recently, financial technology serves as the foundation for end-to-end transaction processing over the internet (Tasca et al., 2016; PwC Global, 2018).

Financial technology has been around for many years, like the financial sector (Mearian, 2017). Since the 2008 economic destruction, new disruptors have displaced the conventional e-commerce providers. Financial technology changed to reshape and disrupt payments, commerce, insurance, asset management, investment, and settlement (clearance) of securities; by sometimes using cryptocurrencies including bitcoin (di Castri & Plaitakis, 2017). Consumers these days want fast loan approvals, person-to-person payments done without fees, and seamless digital on-boarding. These innovations have been made famous by financial technology (PwC Global, 2018). These innovations may not currently dominate the industry; however, financial technology has succeeded in the value chain as crucial financial service links.

Financial technology is disruptive in many forms (Schueffel, 2017). Various disruptive forces have reshaped financial technology (di Castri & Plaitakis, 2017). Online shopping, for instance, has grown and expanded quickly, while in-person shopping has tremendously declined. Consequently, online cashless solutions have dominated most of the transactions (PwC Global, 2018). The balance of power has shifted. Financial service providers like banks can no longer swing customers if they neglect good customer experience. Crowdfunding is now a very viable means of raising funds over the internet.

In-person services are being eliminated (Tasca et al., 2016). Large technology companies, including financial technology, are being used for customer engagement.

New trading platforms have emerged and are gathering data to generate a combined market view (Tasca et al., 2016). Analytics can help uncover potential trends in new trading platforms (De Filippi, 2016). Artificial intelligence through machine learning is leveraged in the financial industry to improve customer experience and compete for market share (De Filippi, 2016). Insurance products are tailored to suit customer needs. In turn, there is an increase in customer demands of coverage for specified timeframes, locations, and uses. Insurers are forced into collecting and analyzing extra data concerning these clients (PwC Global, 2018; di Castri & Plaitakis, 2017). Transaction process improvements continue to remain expensive. As such, traditional financial service companies are hard-pressed into considering alliances with lenders in the marketplace for financial technology solutions; which do not necessitate full infrastructure overhaul (Mearian, 2017).

Changes in Financial Technology Regulations

Regulations have changed in line with financial technology (Tasca et al., 2016). Since the 2008 financial crisis, regulators applied more pressure to larger market players within financial sectors, supporting smaller and more flexible upstarts and firms to gain power (Schueffel, 2017). Also, firms which offered integration technology, data, analytics, and services for banks significantly benefited from increased utilization of the hosted services they offered (di Castri & Plaitakis, 2017). Most regulatory oversight changes covered business and financial service companies.

The financial service firms had to spend time and money complying with the aftermath of the 2009 regulatory landscape (Mearian, 2017). This marketplace then turned its attention towards rolling out new services and products. Banks, in some instances, became technology developers (di Castri & Plaitakis, 2017). The financial service industry had to outsource technology meant for customer on-boarding and electronic payments instead of building it in-house (Peters, Panayi, & Chapelle, 2015). Banks, for example, adopted platforms for online mortgage servicing (Tasca et al., 2016). They were used in processing customer accounts.

Banks are now handling more regulatory concerns linked to mortgage servicing related to financial technology (Tasca et al., 2016). The platforms helped the banks adopt outsourcing solutions due to reduced costs and regulatory risks encountered while managing internal systems. Further proliferation was supported by increasing interest in service-based technologies and systems (Mearian, 2017). The increase of e-commerce caused a healthy regulatory ecosystem for start-up technology suppliers in the retail and financial service industries (di Castri & Plaitakis, 2017). Banks quickly adopted technology, which enables them to bring more efficiencies or generate new revenue streams (Tasca et al., 2016). Therefore, banks included new technologies into their legacy infrastructure, including peer-to-peer payments (Peters, Panayi & Chapelle, 2015).

Mearian (2017) noted that the financial technology supplier system has increased from 10 to about at least 10,000 key players. Consequently, a new service, called ecosystem relationship management, was created. The approach for managing technology partners vary based on the size of the customer base (di Castri & Plaitakis, 2017; Tasca et

al., 2016). For large companies, ecosystem relationship management is a crucial challenge (Peters, Panayi & Chapelle, 2015). For most practitioners, the focus is not on financial technology, but rather on corresponding regulatory framework guiding such innovations; hence, the current financial ecosystem is fragmented.

Companies that leverage machine learning (mostly credit scoring platforms and debt platforms for lenders) help developing nations advance over developmental stages within the financial industry (Mearian, 2017). Central banks in most countries are very hopeful in this role (Tasca et al., 2016). However, they knew that regulatory obstacles in financial technology could prevent or slow down innovation significantly (di Castri & Plaitakis, 2017). So, in emerging markets, governments need to come up with a holistic strategy to create business environments which support financial technology innovation (Tasca et al., 2016).

Since 2015, the financial technology sector has been supported and regulated using “sandboxes” as a regulatory framework (di Castri & Plaitakis, 2017). Sandboxes allow companies to test their solutions in controlled settings for six months. During this period, they cannot immediately impose standard approval procedures and regulatory costs (Mearian, 2017; Schueffel, 2017). Through this process, innovators test their products to understand the administrative boundaries application ones their solutions are approved. Altogether, the process provides regulators with enough time to learn and make decisions which regulate new services and or products (di Castri & Plaitakis, 2017).

The United Kingdom pioneered the regulatory sandbox method in 2015. The goal of this approach was to speed up the financial technology launch cycle and product

development (Davidson, De Filippi & Potts, 2018). Since 2015, countries such as the United Arab Emirates, Brazil, Kenya, India, Australia, and Singapore have adopted the approach (di Castri & Plaitakis, 2017). Since sandboxes are still in its infancy, the impact on the financial innovation trajectory is difficult to assess (Schueffel, 2017; Davidson, De Filippi & Potts, 2018).

Most countries that have tried the regulatory sandbox approach are still in the early stages, subsume Canada, Australia, and Singapore. Other countries whose companies have been admitted into the regulatory approach are the United Arab Emirates, Thailand, and Malaysia. In the UK, the sandbox regulatory method has gained traction (di Castri & Plaitakis, 2017). The Financial Conduct Authority, has received 146 applications, admitted 41 into the testing stage (di Castri & Plaitakis, 2017). This success is because of the accommodating environment in the UK to support financial technology. The UK, apart from sandboxes, has extra regulatory measures to enable financial technology innovation (Davidson, De Filippi & Potts, 2018). The measures include business creation supported through existing tax policy (i.e., start-up investors get tax deductions), the strong safeguard of property rights, help and training for start-ups, and conducive business regulation.

Regulatory sandboxes are helpful; however, financial service innovation necessitates more regulations (Davidson, De Filippi & Potts, 2018). Current appropriation rules do not permit start-up financial technology to bid for public contracts and projects. Data protection rules which protect individual rights are yet to be implemented (di Castri & Plaitakis, 2017). So, the legal framework, in general, requires

improvements. There is a need to streamline the start-up's process and costs linked to business start-up and closure. Thus, it is questioned if it is possible to enact bendable labor laws to assist financial technology companies.

Trends in Financial Services Technology

Financial technology is currently driving new business models. According to PwC Global (2018), new entrants in the market are finding it more accessible to enter the industries dealing with financial services. Financial technology has been creating new ways to break the financial sector, which is considered a high entry barrier business. Fast-moving companies (also called disruptors) are start-ups explicitly focused on innovative processes and technology ranging from insurance to mobile payments. They are increasingly attacking profitable components of the supply chain part of financial services. This practice seems to damage the incumbents. Findings indicated that one-fourth of businesses in this industry are likely to lose their profits to financial technology companies (PwC Global, 2018).

The sharing economy is increasingly embedded in modern financial systems (Tasca et al., 2016). Customers still need banking services as technology undergo such changes and upgrades. By 2020, customers may not turn to the banks to get banking services (PwC Global, 2018). The sharing economy has already impacted hotel rooms, cars, and taxis. The sharing economy means decentralized asset ownership; information technology is used to match capital providers with users, and the bank is not used as the intermediary (Tasca et al., 2016).

Blockchain technology is among financial technologies currently leading in the industry (Holotiuk, Pisani & Moormann, 2017). Various industry groups are collaborating in efforts to commercialize the technology, applying it to the actual financial service situations. The surge in funding and innovation in blockchain is projected to continue as financial technology move away from retail into commercial and institutional use (Al-Saqaf & Seidler, 2017). Companies that leave out this innovation are likely to cease operations in the following five years. The public ledger implemented in the blockchain is expected to be a crucial part of operational infrastructure and technology for most financial institutions (PwC Global, 2018).

Digital technology has become mainstream in modern financial institutions. Most financial institutions built units called e-business to cater for e-commerce interests (PwC Global, 2018). Substantial technology investments especially internet development drove extraordinary advances in service efficiency. Similar markers are evident in the digital wave. The digital agenda is being advanced through budgets, resources, and separate teams most companies are invested. The digital agenda extends from operational efficiency and big data analytics to customer experience (De Filippi, 2016). This approach is intensively being applied in financial services, including wealth management, retail banking, payments, and insurance (Tasca et al., 2016).

Regulators are also turning to technology. These regulators are going beyond financial institutions (Yli-Huumo, Ko, Choi, Park & Smolander, 2016). Regulators are rapidly adopting various data collection and analytic tools (De Filippi, 2016). The goal is to learn more information about individual activities and the systemic activity of the

institutions. Using tools which constitute a new phenomenon called regulatory technology or RegTech, they seek to monitor the financial industry efficiently so that they can predict probable problems rather than regulating after impacts (PwC Global, 2018). Regulators can use sophisticated analytical tools to compare situations and address probable concerns before they turn out into market problems on a full scale.

Blockchain Technology

According to Holotiuk, Pisani & Moormann (2017), blockchain technology was launched as a way of paying for transactions anchored on cryptography to give an alternative method for establishing trust between transacting partners. The technology permits a ledger (collective bookkeeping system) that uses functions (mathematical) to enable participants to reach a mutual consensus before approving the transaction (Al-Saqaf & Seidler, 2017). The details about one transaction are collected in blocks. The blocks are reviewed and certified by the network, then added to the computers of participants chronologically without an external central arbiter. The process lends to secure blockchain authentications.

The primary user then provides the distributed ledger containing verified transactions to other users over the network (Yli-Huumo, Ko, Choi, Park & Smolander, 2016). Thus, the role traditionally played by the financial institutions (trusted third party) is no more needed. The Blockchain is a technology that scrutinizes, mitigates risk, and authenticate transactions (Kondor, PoÁsfai, Csabai & Vattay, 2014).

The most extensive digital products on the blockchain are cryptocurrencies. As a distributed ledger technology, cryptocurrencies like bitcoin and Ethereum has made

contract technologies possible, by recording all transactions (Kiviat, 2015). Moreover, they signify one of the most well-known uses of blockchain technology. The blockchain is suggested as an answer to a broad continuum of transactions ranging from transferring of funds across various currencies (remittances and micropayments) to digital assets and real-time payments involving two parties where bank accounts are not necessary (Wright & De Filippi, 2015; De Filippi & Hassan, 2016).

Blockchain technology applies to various social concerns (Kondor, PoÂsfai, Csabai & Vattay, 2014). The primary attributes of this technology are centered on four key themes. First, the technology reduces interaction, transaction, and transfer fees (Al-Saqaf & Seidler, 2017). Secondly, high security and trust are guaranteed. The decentralized nature permits trust among contracting entities (De Filippi & Hassan, 2016). Automatic traceability and irreversibility are security features guaranteed. Thirdly, the technology integrates the physical and the digital worlds. Intangible and tangible assets can be categorized, and ownership identified translating to counterfeit resilient transactions (Yli-Huumo, Ko, Choi, Park & Smolander, 2016). Lastly, the technology has been reported for a high level of dependability, openness, and transparency (Al-Saqaf & Seidler, 2017).

Blockchain technology is an appropriate solution for carrying out transactions using cryptocurrencies. However, it has some technical limitations and challenges which need to be investigated and addressed (Yli-Huumo, Ko, Choi, Park & Smolander, 2016). Some of the technology risks are; privacy of network nodes, the security of transactions, high integrity, and significant requirements to prevent attacks. These risks are attempted by

hackers to interfere with transactions in Blockchain (Kondor, PoÁsfai, Csabai & Vattay, 2014; Yli-Huumo, Ko, Choi, Park & Smolander, 2016; De Filippi & Hassan, 2016). Moreover, computational power is required to confirm transactions. These limitations warrant regulations on this emerging financial technology, which may be either more stringent or less strict compared to traditional financial systems.

The Blockchain Technology Regulatory Framework

In 2017, the European Securities and Markets Authority issued a report on distributed ledger technology (Yeoh, 2017). The report concluded that the regulatory action on blockchain was premature as the technology is still in the early stages (Kiviat, 2015). The report found that the existing European Union regulatory framework does not represent a hindrance to distributed ledger technology use (De Filippi & Hassan, 2016).

Currently, the legal environment for blockchain technology is immature. Automation of laws appears to be an inevitable process. Implementing laws about blockchain technology implementation can drastically alter social relations and legal practice. Nonetheless, early technological implementation phases mean more time is required (De Filippi & Hassan, 2016). Thus, a correct assessment of how these laws impact financial operations is timely.

Sufficient regulation is lacking as far as blockchain technology is concerned (De Filippi & Hassan, 2016). Typically, new technologies pose a problem for rigid legal laws. Legislations are generally not adapted to the speed of economic and social changes linked to new technologies (Yeoh, 2017; Davidson, De Filippi & Potts, 2018). Altogether, it is difficult to evaluate and predict the correct influence of blockchain solution. Irrespective

of the positive impacts linked to new technology introduction, some threats are also reported.

Research shows that the legal and regulatory risks in digital currencies and the corresponding payment mechanisms have not been fully understood (McKinlay, Pithouse, McGonagle & Sanders, 2018). The lack of clarity in regulating digital currency has led developers and users to complain considering the unpredictability and ramifications for breaking financial laws. Moreover, others have seen the absence of regulation as a significant impairment of the growth of public confidence in the digital currencies (De Filippi & Hassan, 2016). Many investors are, for that matter refraining from investing in new technologies because of legal uncertainty as well as lack of safeguard for the users.

Until now, the development of blockchain technology has been performed mostly by technology firms. These firms have little to no experience in financial matters. Banks have had a tendency not to directly engage with digital currencies developers and users, namely Bitcoin and Litecoin (Tasca et al., 2016). One of the many reasons for this is because of awareness of risk and uncertainty above compliance or legal issues. Nonetheless, major financial institutions are very slow to adopt new risks and operate conservatively. The international nature of digital currencies requires a coordinated methodology at an international level for regulation on blockchain to be effective entirely.

Legal Issues

Jurisdiction is a significant legal challenge regarding blockchain technology. Given that blockchain nodes can be situated at any geographic location across the world, it crosses jurisdictional boundaries (McKinlay, Pithouse, McGonagle & Sanders, 2018). This capability presents various complex jurisdictional problems requiring careful consideration of appropriate contractual relationships. Contracting principles vary across different jurisdictions. Thus, it is vital to identify suitable governing legislation (Yeoh, 2017). In the decentralized environment, identifying clear rubrics applied is difficult (Wright & De Filippi, 2015). Thus, it is not the same as traditional financial systems like banks, where they are sued in cases of fraudulent or faulty transactions (Tasca et al., 2016).

Service performance levels present legal problems of modern financial technologies (Cuccuru, 2017). Vendors are willing to pledge performance assurances depending on their risk and reward profile, the multiplication factor for accommodating substantial liabilities for many customers, and their service delivery model (McKinlay, Pithouse, McGonagle & Sanders, 2018). In other words, vendors prefer to provide services at limited availability level and exclude warranties about service performance. Thus, the customers are left without assurance that services will be available and reliable, or the technology can function as described (Yeoh, 2017). Balancing such performance risks becomes challenging with regards to regulations on developing financial technologies (De Filippi & Hassan, 2016). In traditional financial systems, customers are assured that services will be available and reliable (Paech, 2017).

Another legal problem linked to blockchain technology is that of liability. Customers can incur systemic risks if there are problems with trading transactions. Customers are also liable for confidentiality and security risks (Cuccuru, 2017). Blockchain technology poses various risks linked to technical operations such as controlling and stopping the functioning of this technology. Therefore, the allocation and designation of liability and risks with regards to malfunctioning blockchain services must be carefully considered at the vendor level, customer level and all parties affected by the trade or transaction (Paech, 2017).

Decentralized autonomous organizations (DAOs) influence legal powers regarding contracting. DAOs are online digital entities which operate by implementing pre-coded rules (McKinlay, Pithouse, McGonagle & Sanders, 2018). Such entities require only zero to minimal input to operate. They are utilized in the implementation of smart contracts and record blockchain activities. In current legal systems, actual people and organizations actively participate (Paech, 2017). Most systems give organizations several legal powers real people also have, subsuming suing, being sued, or entering into legal contracts to encourage participation.

The challenge is attaching legal status to DAOs (Paech, 2017). The dilemma is in defining them as either partnership, simple corporations, legal contracts, or legal entities (Ducas & Wilner, 2017). Given the automating management of DAOs, legal systems may find it challenging to hold someone responsible for broken regulations. Therefore, the liability is for both creators and DAOs; legal disputes become challenging. Financial technologies can bypass established present oversight problems for court decisions and

financial regulators (McKinlay, Pithouse, McGonagle & Sanders, 2018). The problem is not evident in traditional financial systems.

Data privacy is a legal problem presented in emerging financial technology. In blockchains, for example, data cannot be changed once it is stored. Data privacy implications arise from the nature of personal data involved (Yli-Huumo, Ko, Choi, Park & Smolander, 2016). Similarly, the exceptional transparency of transactions carried out using blockchains does not conform to privacy needs required by banking among other traditional financial sectors (McKinlay, Pithouse, McGonagle & Sanders, 2018). Crypto-addresses are used for identity (Yli-Huumo, Ko, Choi, Park & Smolander, 2016). However, the addresses give competitors exact information about the transactions, yet traditional financial sectors, by law, are needed to maintain secrecy.

Impacts of Regulations on Blockchain Technology Adoption

Different industries are attempting to embrace blockchain technology into their existing system. These applications necessitate standard blockchain technology laws and regulations (Davidson, De Filippi & Potts, 2018; Kiviat, 2015; Yeoh, 2017). The four major areas which drive attention from most governments globally are tax issues for virtual currencies, data encryption, identity management, and privacy (De Filippi, 2016). Currently, regulations are highly depending on each government rather than a standardized one. Asset managers, as such, are delaying blockchain technology implementation because of their fears over substantial regulatory change.

The federal government in the United States has not applied any power to control blockchain technology (Yeoh, 2017). However, it intends to let the state governments

introduce their regulations. This move can cause contrasts and differences (Cuccuru, 2017). Europe has a more welcomed, accepted, and standardized regulations toward blockchain technology. On the other hand, China does not allow bitcoin due to the required regulations (Davidson, De Filippi & Potts, 2018).

Pinna and Ruttenberg (2016) reported three issues which require a solution before most countries completely realize blockchain technology. These issues are:

1. Blockchain technology is still in its infancy
2. Operational, governance and legal issues will take more time to clarify
3. Even after implementation, some functionalities will continue to be obligatory and cannot be in any way replaced by blockchain technology.

Research has yielded that blockchain seeks to improve efficiency and productivity (di Castri & Plaitakis, 2017; Schueffel, 2017; Davidson, De Filippi & Potts, 2018; De Filippi, 2016). Nonetheless, steps which companies must put in place before implementation have not been fully developed (Pinna & Ruttenberg, 2016; Scarbrough & Steffen, 2017). The underlying idea is that nodes run simultaneously on a distributed database (Hwa, 2016). Evidence shows that loads of legal uncertainties must be resolved to expedite the mass adoption of technologies surrounding digital currencies (Guadamuz & Marsden, 2015; di Castri & Plaitakis, 2017).

Regulating Blockchain and Other Emerging Financial Technology

Several regulators purpose is to investigate blockchain technology use and cryptocurrencies among other emerging financial technologies. The financial technology is attractive to most regulators because of the improved security of business transactions

and reduced manipulation risk. (McKinlay, Pithouse, McGonagle & Sanders, 2018) Nonetheless, as an emerging technology, it results in challenging regulatory and legal problems most regulators grapple with understanding. The regulations for emerging technologies, in general, are in flux. Multiple jurisdictions across countries make regulations challenging (Yeoh, 2017; Davidson, De Filippi & Potts, 2018).

Worldwide, many startups choose to focus on blockchain technology (Cuccuru, 2017). Most countries continue to support the developments linked to the digital currency, thereby encouraging new methods of transacting business activities. Nonetheless, others have boycotted the technology, considering it as illegal and detrimental disruption, which brings global economic unrest and financial instability (Wright & De Filippi, 2015). Countries supporting this technology indicate that with proper protections and safeguards, the technology can alter how security and trust are established in contemporary online transactions through several applications in payments, financial services, property management, healthcare, intellectual property management and energy (Davidson, De Filippi & Potts, 2018; Kiviat, 2015).

The regulatory environment in the United States differs from that of Europe. Regulators in the United States are monitoring the development of distributed ledger technologies closely, such as blockchains (Yeoh, 2017). Blockchain implementation and regulation is apparent in some states. Several states recently proposed bills and promoted increasing usage of blockchain and bitcoin technology (Wright & De Filippi, 2015; Davidson, De Filippi & Potts, 2018). For example, Arizona uses the technology to

recognize smart contracts, Delaware registers company shares in blockchain form, and Chicago uses the technology for real estate records.

Virtual currencies exchanged in the United States are being monitored (Cuccuru, 2017). Various regulators have presented issues about market integrity and financial stability. For example, the US Securities and Exchange Commission examined the possibility of applying blockchains in financial service transactions within the existing public securities market (Bartlam & Radcliffe, 2017; Kiviat, 2015). The technology can help trace margin financing, securities lending, and monitor systemic risks. Nonetheless, regulators must lead, quickly respond to possible weaknesses, and harness the technological benefits (Wright & De Filippi, 2015).

The Commodity Futures Trading Commission has examined the usage of distributed ledger technology and blockchains in derivative markets, recommending that they do not harm laws to encourage investment in such technologies (Yeoh, 2017). There are currently no industry standards for this technology. The reason is that the technology is still developing, with incremental implementations. As such, the policies provided linked to the technology are untrusted (McKinlay, Pithouse, McGonagle & Sanders, 2018). The Financial Crimes Enforcement Network (FinCEN) has issued interpretive guidance and administrative decisions about blockchains and other virtual currencies. Money transmission regulations and commodity market's metal trading regulations are currently being applied to brokerages using the technology.

The European Union has a positive, welcoming approach to Bitcoins and Blockchain technology. It has adopted the business philosophy of innovation first then

laws later (Davidson, De Filippi & Potts, 2018). This approach encourages innovators to exploit use cases for testing regulations and gives entrepreneurs confidence suggesting that regulators and target markets trust their approved apps. It indicates support for virtual currencies development (Cuccuru, 2017). Through distributed ledger technology regulations, the European Union seeks to reshape the interactions among administrators, businesses, producers, consumers, and creators (Kiviat, 2015).

The European Securities Market Authority has warned of risks distributed ledgers are likely to pose to the securities market from the public policy standpoint (Yeoh, 2017). The Financial Conduct Authority in the United Kingdom has developed regulations called Fintech sandbox (Davidson, De Filippi & Potts, 2018). Through this approach, the Financial Conduct Authority can watch and observe the way blockchains technology develops (McKinlay, Pithouse, McGonagle & Sanders, 2018). The Financial Conduct Authority suggests that distributed ledger technology should be utilized considering digital currencies, shared database models, initial coin offerings, and digital asset trading.

Areas of Regulatory Focus

The interest of regulators has increased in recent times to mirror an increase in token sales and cryptocurrency rise (Pinna & Ruttenberg, 2016; Scarbrough & Steffen, 2017; Guadamuz & Marsden, 2015). There seems to be an interest in issuing more regulations geared toward firms employing distributed ledger technology or blockchain (Schueffel, 2017). What these regulations may ultimately look like remains unclear (Hwa, 2016; di Castri & Plaitakis, 2017; Pinna & Ruttenberg, 2016). However, future

regulations may focus on critical areas such as security, confidentiality, privacy, anti-money laundering, and know-your-client requirements (Cuccuru, 2017).

Currently, regulations for blockchain is unclear (Hwa, 2016). Some researchers suggested that future legislation is likely to focus on whether or not businesses are guarding consumers and securing digital assets properly (Scarborough & Steffen, 2017). Blockchains, including bitcoin, repeatedly use private and public keys. For instance, individuals who want to transact in bitcoin may maintain their private keys (Kiviat, 2016). Alternatively, they can rely on third-party vendors to protect their private keys. Unfortunately, these third parties are susceptible to attack. Many high-profile hacks have been reported, mostly customers suffering losses (Trautman & Harrell, 2016; Cuccuru, 2017).

Although characters who employ blockchains remain anonymous, the transactions are public (Trautman & Harrell, 2016). Distributed ledger technology poses confidentiality and privacy issues that are drawing attention from regulators (Cuccuru, 2017). Some innovators have created technological solutions aimed at preserving confidentiality and privacy within the public blockchains (Cuccuru, 2017). For instance, The Xeon Processors are designed such that they provide a layer of hardware security (Kiviat, 2016). Regulators may demand that such technologies be used by or made available on open blockchains. Additionally, they may exercise oversight over participants in private or permission blockchains to make sure all participants comply with regulations on data privacy (Scarborough & Steffen, 2017).

Regulators require companies to comply with anti-money laundering and know-your-client requirements when applying blockchain technology in money transfers, securities settlement, and smart contract transactions (Trautman & Harrell, 2016; Böhme, Christin, Edelman & Moore, 2015). Thus, having a robust compliance program will be a must even for firms handling crypto assets (Scarborough & Steffen, 2017).

The nature of domestic regulation is uncertain. Also, how the regulation is conducted is unclear. Regulators are likely to interpose themselves directly onto a blockchain. To attain this, for example, they may opt to maintain a node on a network — allowing regulators to observe the transactions in real-time. Irrespective of what system regulations take or how the regulations are enacted, regulators will continue acting. Once regulators act, firms using blockchain technology may accommodate new rules and circumnavigate the heightened scrutiny. Research shows that increased regulation may unquestionably involve increased expenses in the short term (Böhme, Christin, Edelman & Moore, 2015).

Previous Research

According to Hwa (2016), introducing blockchain technology makes it necessary to reorganize the current centralized regulation system to adopt a distributed ledger system. Furthermore, a considerable number of legal concerns, including physical data storage location, standard protocol, and governance of the blockchain and legal intervention basis for regulatory authority exists. For financial institutions, blockchain technology can be introduced in the form of a conglomerate or a private blockchain as there is a limit to introducing a public blockchain (Hwa, 2016).

Au and Kauffman (2008) examined the application of a new technology that is emerging progressively about mobile payments and wireless connectivity. Given the surprises and nuances of such a technology, the authors caution readers to notice that most similar economic forces work like related technology applications and other prior financial service systems. The study focused on providing senior management and all stakeholders with the insights needed to adapt to a world of innovations that continue to change business processes, information management and security, investments, and business value amongst others. The investigation presented a model which allowed identification of applicable theory and pertinent stakeholders in analyzing social issues, business processes, firm concerns, customer needs, modern trends and market needs (Au & Kauffman, 2008).

Avgouleas (2015) provided a detailed, up-to-date survey of the purpose and nature of financial regulation. The author investigated the regulatory model for financial innovation. The study covered fundamental terms linked to financial innovation, the costs, and benefits of financial innovation, and how financial institutions can engage in regulatory tax and regulatory arbitrage. The study also examined financial innovation costs, benefits, and risks, considering the global financial crisis which occurred recently to emphasize the grave risks that stem from the shadow-banking industry. The framework served as a policy guide for post-2008 financial, technological innovations.

Brito, Shadab, and Castillo (2014) study presented a survey focused on financial transactions and financial instruments of significant interest to regulators, subsuming new bitcoin-denominated instruments, decentralized markets, decentralized exchanges, and

traditional securities and derivatives. The results suggested that considering the Commodity Exchange Act, bitcoin derivatives cannot be subjected to financial regulations entirely because the derivations require physical delivery, unlike cash settlements. Additionally, the derivatives are not traded independently nor are fungible (Brito & Castillo, 2014). The study is vital as it discussed the classification of virtual currencies for regulation as compared to that of the traditional currencies that rely on intermediaries such as the banks, security exchanges. It also explained the complexities of the decentralized nature of the blockchain technology and how that makes it difficult to control and regulate.

Davidson, De Filippi, and Potts (2016) presented a case study on Backfeed, a platform originating from the double ledger and decentralized nature of blockchain technology. The Ethereum-based platform is used to create new commons-based collaborative economies. Accordingly, this emerging technology is going to be used in government and all businesses. Apart from being new disruptive information and communication technology, blockchains are institutional technology (of governance) competing with other institutions that practice capitalism including governments, markets, firms and networks (Davidson, De Filippi & Potts, 2016).

De Filippi (2016) evaluated bitcoin, advanced cryptographic techniques, and other emerging blockchain-based networks, and projected that decentralized infrastructures are currently suffering from radical transparency. The study revealed that the technology gives end users' privacy benefits; the network features present other privacy risks. Potentially sensitive information can be retrieved using big data analytics to trace all

transactions carried out (De Filippi, 2016). This study focused on information security as it relates to new technological advancements in decentralized transactional activities. There is a discussion on how blockchain technology was created to decentralize transactional information and make it a lot harder to hack.

Faerman, McCaffrey, and Slyke (2001) explored the role of public and private sector collaboration such as, the Derivatives Policy Group, which has shaped the current laws on financial innovation. Procedures were devised for internal control, risk management, and unregulated financial areas from 1994 to 1995 by the Derivatives Policy Group, United States and Exchange Commission, and Commodity Futures Trading Commission. This research is concerned with the understandings and importance of public-private collaboration to arrive at acceptable regulation or oversight for the emerging financial technologies (Faerman, McCaffrey & Slyke, 2001).

Kakavand and Kost De Sevres (2016) discussed the technology behind blockchains, their potential in a digital world, current technological implementations, and the current and future regulatory landscape. An interplay between the technology behind the digital currencies, distributed ledger technology, and blockchain technology is explored considering benefits, limitations, and tradeoffs. The study also proposes the application of blockchain as a very innovative solution to payment systems, financial asset clearing and settlement, financial market operation risks and smart contracts (Kakavand & Kost De Sevres, 2016).

Peters, Panayi, and Chapelle (2015) presented how the use of the internet and mobile technology has evolved from e-money to more centralized digital or virtual

currencies. The study described the historical setting, which resulted in centralized virtual currencies and P2P online payments developments. The authors acknowledged that the currencies, being digital constructs, lack backing from local authorities and governments (Peters, Panayi & Chapelle, 2015). They discussed how these cryptocurrencies eliminate the need for financial intermediaries such as the banks to offer direct peer to peer monetary transactions.

Summary and Conclusions

A detailed examination of legal issues surrounding blockchain technology revealed that the technology is perceived currently as a disruptive solution (De Filippi & Hassan, 2016; Peters, Panayi & Chapelle, 2015; di Castri & Plaitakis, 2017). This assessment helps in addressing technology-related challenges. It is also essential that a consensus is reached on the way distinctive jurisdictions can create a legal and regulatory model that handles regulatory issues linked to blockchain solutions. There legal concerns are about intellectual property, data privacy, choice of jurisdiction, and enforceability of contracts (Davidson, De Filippi & Potts, 2018; Kiviat, 2015; Yeoh, 2017; McKinlay, Pithouse, McGonagle & Sanders, 2018; Tasca et al., 2016; Wright & De Filippi, 2015).

The literature revealed insights into the blockchain technology regulatory framework, which contrasts the framework for most traditional financial systems. Newer technologies are generally not restricted or prohibited by regulators (Wright & De Filippi, 2015); this phenomenon is apparent in jurisdictions like the UK and the United States (De Filippi, 2016). Regulations and laws relating to cryptocurrencies and blockchain technology are either prohibitive or enabled depending on the circumstances of the

stakeholders (De Filippi & Hassan, 2016; McKinlay, Pithouse, McGonagle & Sanders, 2018; Yeoh, 2017; Tasca et al., 2016). The regulatory environment on the emerging financial technologies is not as clear on the various laws as it is with the traditional financial system (Yeoh, 2017).

The objective of this research is to compare the effects of regulatory constraints on new and emerging financial systems on the regulatory impact on existing controlled or traditional financial systems. The present study attempted to fill at least one of the gaps in the literature comparing emerging financial technologies with traditional financial systems, considering the current regulatory approaches. Thus, the current study extended knowledge in the discipline, informing of the critical impacts of regulations (Yeoh, 2017; McKinlay, Pithouse, McGonagle & Sanders, 2018). This chapter discussed the literature on the subject, focusing on emerging financial technologies, blockchain technology, legal issues, and prior research. Chapter 3 presents the principal methodology adopted in collecting primary data.

Chapter 3: Research Method

Introduction

The purpose of this quantitative, correlational study was to examine the effects of financial regulations on blockchain and emerging financial technologies compared to the effects of regulations on traditional financial systems. I investigated whether regulations would have the same effects on blockchain and emerging financial systems as it did with traditional financial systems. The dependent variable was regulatory impacts, and the independent variables were emerging financial systems, and traditional financial systems. Elements of organizational economics theory such as transactional cost theory, agency theory, and contract theory were applied in analyzing the variables to help address the research question. Primary data were collected using survey questions modeled after the U.S. Chamber of Commerce's Center for Capital Market Competitiveness study of the effects of regulation on the economy in 2016 (U.S. Chamber of Commerce, 2016; see Appendices A & B). The data collected from both surveys were computed and compared through a correlational statistical analysis, and the results discussed in terms of this study.

In this chapter, the methodology and the research design are presented. The main sections included in this chapter are research design and rationale, methodology, population, sampling, and sampling procedures. Other sections that are presented include procedures for recruitment, participation, data collection, instrumentation, and operationalization of constructs, data analysis plan, threats to validity, and ethical procedures.

Research Design and Rationale

This study followed a quantitative, correlational research design. Quantitative designs are applicable when testing the strength of the relationship between numerically measurable concepts (Howell, 2013). Correlational designs encompass the examination of one-way and two-way relationships (Pagano, 2009). With the correlational design, I sought to examine whether a relationship existed between emerging financial technologies compared to traditional financial systems in terms of regulatory effects. Through a correlational design, the possible effects of emerging financial sector technology could be investigated. In this study, the role of the researcher was to determine the sample, collect data using questionnaires, and analyze the data through statistics that address the research questions.

In a correlational study, a sample from the population of interest is surveyed for information affecting that group. It is also easy to define the attitudes, opinions, and behavior of a group or groups based on the topic under study to generalize the findings to the entire group or groups (Grimaldi & Engel, 2007). Further, correlational studies produce rich data leading to significant recommendations (Grimaldi & Engel, 2007). Data that are statistically compared for effects on a population are provided when responses are categorized into deliberate choices (Leeuw & Dillman, 2008). The advantage is that significance of the results collected by the researcher can be measured by the whole population and changes in attitudes, opinions, and behavior also tracked over time (Casadevall & Fang, 2008; Grimaldi & Engel, 2007).

The survey inquiry strategy was appropriate for this research because it helped in collecting self-reported views and personal information that cannot be accessed at other places. Survey data collection enables the researcher to collect and present data from the populace of interesting opinions, attitudes, and beliefs at a given time before making inferences (Shields & Rangarajan, 2013). Thus, a cross-sectional survey approach based on analysis was selected for the current study. The goal was to ensure proper identification of the legislative or regulatory guidelines and impacts for the traditional financial systems. The information was then used for comparison of a probable legislative or regulatory guideline of blockchain and other financial technology.

The new and emerging financial technologies do not have enough history of collecting actual data on aggregated regulatory effects on that industry. Hence, a survey of a sample of that population was conducted for information on the projections of full-scale regulatory effects. Data on aggregated regulatory effects on the traditional financial system was also surveyed and used for comparison and analysis to ensure credibility and validity. The online research platforms selected were verified to ensure that information collected from the participants were secure and were only used as data for the statistical analysis in this study (see Casadevall & Fang, 2008). This research method was used in addressing the issues of time constraints. This method was also advantageous because it is relatively cheaper and quick to administer. However, it cannot be used to track changes.

Methodology

Quantitative methodologies involve analyzing the quantitative features of social phenomena, change, and relationships (Creswell, 2013). Quantitative methodologies involve statistical investigation to formulate hypotheses, collect accurate data, perform statistical testing, and analyze results (Maxwell, 2013). Cross-tabulations and frequency distributions using the Lambda and Kendall's Tau c test were used to test the data collected to address the research question in this study.

The correlational design was applied in the current study on the effects of regulations on blockchain and emerging financial sector technologies in comparison to regulatory effects on the traditional centralized financial systems. Emerging financial technologies are used in value records transactions with features that enable the realization of inexpensive systems, the creation of systems without downtime, and making falsification difficult (Itzhak & Stephanie, 2017). In this context, surveying was necessary to compare financial technologies with traditional financial systems to ascertain the impact of the regulatory environment and develop policy guidelines to encourage other industries to apply this technology in the future.

The surveyed data were used to create the foundation for analyzing blockchain and emerging financial technology and its regulatory environment in comparison with traditional financial systems. Little research has been carried out or written about the regulatory environment of blockchain technology and other financial technologies, which necessitated further research (Holotiuk, Pisani, & Moormann, 2017). The survey provided personal experiences and opinions of the participants linked to the regulatory

environment of blockchain and other financial technologies in comparison with the centralized, traditional financial systems. The information is valuable because it extends the literature.

Analysis of the data collected was guided by the theoretical foundation of organizational economics in assessing the applicability of the research to making a positive economic impact in society (Bryman & Bell, 2013). If researchers subsequently study this topic, this methodology should yield the same or similar results. A study's interpretation depends on the principal investigator, although the research material may not change. Blockchain technology and other financial technologies are comparatively new, so there is limited knowledge about it and its regulatory environment. Hence, this methodology can allow for future researchers to validate the results obtained in this study (Bussmann, 2017; Holotiuk et al., 2017; Itzhak & Stephanie, 2017; Yilmaz, 2013).

Population

The target population was American residents ages 18 years and older who are engaged in the U.S. financial and technology sector. The population consisted of financial regulators, financial sector managers, financial analysts, and financial technology participants. The new and emerging financial technologies are prevalent in other countries around the world, but for this study, the population was limited to residents of the United States. The online survey using various platforms were actively used to sample participants to ensure responses were collected from only the target population. The target population was selected based on their knowledge, exposure, and experiences in the financial sector. The backgrounds of participants were defined and

researched through their profiles and by recommendation. Survey Monkey audience, LinkedIn, and other online research audience platforms were employed for targeting financial and technology sector populations.

Sampling and Sampling Procedures

The sample was calculated by G-Power 3.1.7 to present sample requirement information for the survey. It was expected that there would be a medium effect size (0.15), with an alpha of .05, and power of .80 (Faul, Erdfelder, Buchner, & Lang, 2009). This assumption was based on the expected difference in the target population in this study comprising of employees working in the financial sector and financial technology institutions. The G-Power calculations provided a sample size guide of 193 participants. The target sample size suggested was 300 based on two sets of survey questionnaires and the G-Power sample size estimation, to increase external validity (see Figure 1).

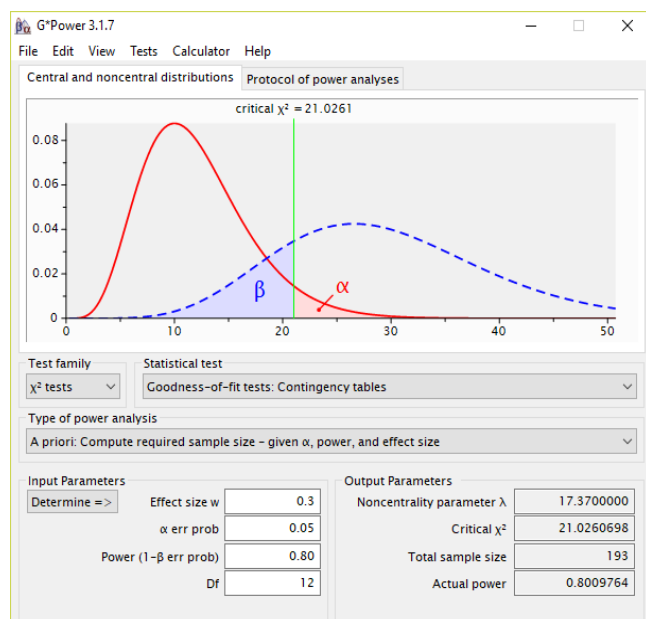


Figure 1. G-power a priori computation of sample size.

Sampling procedures in this study targeted employees working in the financial sector and financial technology institutions. The suggested sample size of 300 was expected to be comprised of well-investigated participants with adequate knowledge of the subjects under discussion, to ensure reliability and credibility. Participant educational and professional profiles were stipulated to validate their understanding of financial and technology concepts. Random sampling was preferred because of the benefits of generalizing the study to the general financial sector population. Using probability sampling, qualifying participants were given equal chances of participation in the research study.

Procedures for Recruitment, Participation, and Data Collection (Primary Data)

Recruiting involved online research platforms. Social media platforms like LinkedIn and Facebook were used. Participants were not excluded based on gender, race, ideology, and political interest or other demographical information except the stated requirements. The demographic information that was collected included ages to be 18 and above, educational, and professional background reflecting an understanding of financial concepts and must be a U.S. resident. Informed consent notices were made available to participants that explained their participation was voluntary. Questions covered subjects such as economic outlook, state of corporate finance, regulatory impact, and challenges, relationships with financial institutions, cash operations, familiarity with financial technologies, and projections about financial technology, among others.

Walden University's research and ethics approval through the Institutional Review Board (IRB) was obtained on February 8, 2019 with approval number 02-08-19-

0658812 to proceed with the research. Participants were provided with a consent form that outlined the purpose of the study, potential benefits/weaknesses, potential reward/compensation. Participants had to agree to participate in the study. Each participant was given a confidential numeric identifier. After providing consent, participants completed a demographic questionnaire. Unless requested by the participants, follow-ups with the participants after they completed, their responses were not required.

Instrumentation and Operationalization of Constructs

The measurement instruments used in this study included an online survey that enhanced the Center for Capital Market Competitiveness U.S. Chamber of Commerce study of the impact of financial regulation on the economy. Modified survey questions on traditional and emerging financial systems were directed to get a select group of credible participants' projections on regulatory effects on financial technologies. The survey included 10 questions on traditional financial systems (see Appendix A) and 10 questions on emerging financial systems (see Appendix B). They consisted of categorical items and ordinal items through questionnaires.

The survey questionnaire responses were used as the measurement instrument to collect information from employees, analysts, regulators, and developers in the financial sector and financial technology institutions. Some of the concepts this study explored were regulations, management, product value, anonymity, and market share. The survey approach was considered suitable for this investigation because it supports efficient data collection, and many respondents in various states could be questioned (Maxwell, 2013).

Surveys, if created and administered suitably, serve as a significant source of high-quality data (Creswell, 2013).

Impacts of financial services regulation to be operationalized included variables such as increased cost of doing business, delayed or canceled planned investments, the price increase for consumers, cuts in personnel, reduced interest in financial services, reduction in general economic outlook among others. Macroeconomic and business operational concerns were also targeted in the information gathering process to give insights into the exploration of the organizational economics theory.

Data Analysis Plan

The raw data from the survey were uploaded into SPSS version 24.0 for Windows. First, the data were screened for partial and incomplete responses. Data screening corresponds to the process in which the researcher makes sure the data gathered is clean before more statistical analyses can be carried out. Participants who did not respond to at least 50% of the survey were removed from the additional analysis. The demographics of the sample were examined through descriptive statistics such as frequencies, percentages, means, and standard deviations.

I sought to answer the research question “How do regulatory effects on traditional financial systems compare to regulatory effects on blockchain and emerging financial systems?” The hypotheses were

H_0 : Regulations will not have the same effects on blockchain and emerging financial systems as it did with traditional financial systems.

*H*₁: Regulations will have the same effects on blockchain and emerging financial systems as it did with traditional financial systems.

Cross-tabulations and frequency distributions using the Lambda and Kendall's Tau c test were conducted between the type of financial system and regulation effects to address the research question. Cross-tabulations and frequency distributions are appropriate when testing the association between two categorical variables and ordinal variables (Howell, 2013). Type of financial system consists of traditional and emerging. Regulatory effects comprised of 20 independent survey items (see Appendices A & B). Type of financial system and each of the regulatory effects were cross-tabulated. Statistical significance of the tests was evaluated at the conventional level, $\alpha = .05$.

Threats to Validity

External Validity

External validity in research means the extent to which the conclusion made is reasonable to generalize the findings to other settings or contexts (Pearl & Bareinboim, 2014). External validity is the capacity to generalize findings into different social situations and environments (Bryman & Bell, 2013). The computational and statistical methods devised in this study produced valid generalizations to other people and situations. I used theories and data that can be applied in different settings other than the one for this investigation. Situational factors that could influence the validity of this study includes invalid responses from participants. I avoided using acquaintances, family members, or coworkers as participants to mitigate any form of influence on the participants. To adhere to ethical regulations, the APA Ethics Code was followed.

Internal Validity

Internal validity, in scientific research, means the extent to which an underlying conclusion is warranted, based on the investigation. The extent to which an investigation minimizes bias determines internal validity (Pearl, Glymour, & Jewell, 2016). The causal association between operational variables is appropriately illustrated to ensure that the inferences made possess internal validity. Numerous variables are used in this study. As such, it is possible to pick among the alternative explanations provided. Many potential confounds were avoided in this research. Participants were selected from populations with different characteristics or demographics as long as they qualify as part of the intended pool of participants to avoid selection bias.

Construct Validity

Construct validity means the extent to which a given test truly measures what it claims to be measuring (Pearl, 2015). It also means the suitability of inferences made based on measurements and observations made (Wieland, Durach, Kembro & Treiblmaier, 2017). Several measures were undertaken to guarantee to construct validity. First, the items used measured the construct of focus in this investigation, which is blockchain and emerging financial technology. Second, a substantive approach was emphasized that there are some theoretical foundations which underlie the construct, blockchain, and emerging financial technology. The sample used was adequate. Thus, the test can be generalized across different tasks, groups, and settings.

Ethical Procedures

Data collected needs to be meaningful. Some respondents usually become very concerned if required to answer many survey questions (Musmade et al., 2013). Also, some participants may perceive the questions as an invasion of their privacy (King, Kyando & Massoi, 2014). During the survey design process, all survey questions were thoroughly reviewed to address such concerns. The goal of the review was to ensure that the researcher collects information which is essential to attain the objectives of this research without any unintended negative consequences to the participants.

The first ethical concern to address in this research was informed consent. Informed consent means that study subjects agree voluntarily to participate (Musmade et al., 2013). It is a process (and not merely the form signed) through which the participants were guided in understanding the research project and related risks (King, Kyando & Massoi, 2014). Informed consent was prioritized, and responders were informed before participation was allowed. The participants were given information including the research purpose, research procedures, length of participation time, discomforts to the participants, a statement showing voluntary participation, a statement showing the rights of the participants to withdraw at any time, and confidentiality as advised by Musmade et al. (2013).

The faculty mentors played an essential role in the process of informed consent. Faculty advisors guided the researcher throughout the research to guarantee ethical conduct (Musmade et al., 2013; Gupta & Kharawala, 2012). Before data could be collected, the IRB approval was obtained. I ensured to follow all ethical research

practices as guided by the supervisor, followed all guidelines given and obeyed ethical principles and institutional standards.

Confidential data usually are coded, and subjects allocated pseudonyms (King, Kyando & Massoi, 2014). The data were grouped and analyzed as variables which guarantee confidentiality. Participants were coded by using their initials and assigned participant number. Study codes used on data documents, especially completed questionnaires. Confidentiality was operationalized through anonymity in processing collected data. The researcher restricted access to personally identifiable information (Fouka & Mantzorou, 2011). Data was stored on a flash drive, and data documents stored in a locked location, to ensure the protection of confidential data. Additionally, data was accessed by the researcher and the supervisor. The raw data will be disposed of in a five-year interval.

Researcher Bias

Research or experimental bias is where the researcher influences the results of a study to portray a predetermined outcome (Klamer et al., 2017). Some of the variables that cause a specific outcome in research work are management process, value or beliefs, anonymity, and money transfer. The topic under study was of interest because of the intellectual and commercial value of innovative technological advancement to the society in general. There were no personal biases or invested interests for this study or the topics under discussion. The research was conducted for academic purposes only; the researcher did not receive or take any financial positions of profit on the topics being studied. The

identification and management of personal biases ensure the integrity of the study and help avoid skewed results or conclusions.

Summary and Conclusions

Existing regulations and laws do not adequately cover the scope and scale of decentralized systems and financial technologies. The current used comparative analysis to explore the influence of blockchain and other emerging financial technology on industries and society at large (Avgouleas, 2015). Regulatory effects on blockchains and emerging financial technology as compared to traditional financial systems were analyzed with quantitative techniques. This research sought to understand how regulatory constraints impact new and emerging financial systems and how that compares to their effects on existing controlled traditional financial systems.

This chapter focused on the methodology adopted and the research design that was used. The research method was a correlational study that used online surveys to gather information from the sampled population. The statistical technique used was cross-tabulations and frequency distributions using the Lambda and Kendall's Tau c test for the data collected to address the research questions identified for this study. The topics included in this chapter were the research design and rationale, population, sampling and sampling procedures, procedures for recruitment, participation, and first data collection.

The study focused on learning the impact of regulation on blockchain and other emerging financial technology compared to traditional financial systems. The research question and hypotheses examined the current state of the effects of regulations on emerging financial technology, and the findings compared with findings on the effects of

regulations on traditional financial systems. The lack of adequate regulatory measures and standards for emerging financial technologies necessitates this study to add to the limited academic work on the subjects in the financial service sector. Chapter 4 provides the results of the study.

Chapter 4: Results

Introduction

The purpose of this quantitative, correlational study was to examine the relationship between the effects of financial regulations on the traditional financial systems compared to the effects of regulations on blockchain and emerging financial technologies. I collected data through surveys to answer the research question “How do regulatory effects on traditional financial systems compare to regulatory effects on blockchain and emerging financial systems?” In this chapter, the findings of the data collection and analysis are presented.

Data Collection

The raw data were first reduced for nonresponses. The demographics were examined through frequencies and percentages. Then cross-tabulations and frequency distributions using the Lambda and Kendall’s Tau c test were used to analyze the data collected to address the research question.

Pre-Analysis Data Screen

A total of 372 participants consented to participate in the research. Among these individuals, 145 did not respond to at least 50% of the questionnaire. Subsequently, these cases were removed from further analysis. The final sample consisted of 227 participants. The G-Power calculations provided a sample size guide of 193 participants, so this number of participants was adequate for the study.

Demographic Data

The distribution of gender was approximate equal for emerging systems and traditional systems. The most prevalent age group for emerging systems and traditional systems was 25 to 34 ($n = 28$). The frequency of participants in the older age categories seemed to decrease. Most of the participants in both samples were White/Caucasian ($n = 61$, 62.2% for emerging systems and $n = 65$, 50.4% for traditional systems). For the emerging systems sample, most of the participants were either married ($n = 42$, 42.9%) or single ($n = 39$, 39.8%). For the traditional systems sample, most of the participants were either married ($n = 68$, 52.7%) or single ($n = 44$, 34.1%). Participants who were in traditional systems had a higher average salary in comparison to participants in emerging systems. Table 1 presents the distribution for demographics.

Table 1

Demographic Characteristics by Type of System

Characteristic	Emerging system (<i>n</i> = 98)		Traditional system (<i>n</i> = 129)	
	<i>n</i>	%	<i>n</i>	%
Gender				
Male	43	43.9	63	48.8
Female	55	56.1	66	51.2
Age				
18 to 24	21	21.4	24	18.6
25 to 34	28	28.6	42	32.6
35 to 44	22	22.4	33	25.6
45 to 54	18	18.4	22	17.1
55 and older	9	9.2	8	6.2
Race				
White	61	62.2	65	50.4
Black or African American	12	12.2	23	17.8
Hispanic	7	7.1	19	14.7
Asian or Pacific Islander	14	14.3	12	9.3
American Indian or Alaskan Native	1	1.0	3	2.3
Multiple ethnicity	3	3.1	6	4.7
Nonresponse	-		1	0.8
Marital status				
Married	42	42.9	68	52.7
In a domestic partnership or civil union, not married	15	15.3	16	12.4
Single	39	39.8	44	34.1
Nonresponse	2	2.0	1	0.8
Income				

				82
\$0-\$24,999	27	27.6	27	20.9
\$100,000-\$124,990	16	16.3	29	22.5
\$25,000-\$49,999	28	28.6	21	16.3
\$50,000-\$74,999	15	15.3	32	24.8
\$75,000-\$99,999	12	12.2	19	14.7
Nonresponse	-	-	1	0.8

Study Results

I sought to answer the research question “How do regulatory effects on traditional financial systems compare to regulatory effects on blockchain and emerging financial systems?” The hypotheses were:

H_0 : Regulations will not have the same effects on blockchain and emerging financial systems as it did with traditional financial systems.

H_1 : Regulations will have the same effects on blockchain and emerging financial systems as it did with traditional financial systems.

A series of cross-tabulations were selected to assess the strength of the relationship between the type of system and regulatory effects on blockchain and emerging financial systems to address the research question. Frequency distributions were focused on survey questions with single variables, and cross tabulations were used for survey questions with two or more variables.

Cross-Tabulations

For Survey Question 1, the cross-tabulations between type of system and description of organization was not statistically significant ($\text{Lambda} = 0.03, p = .485$; Kendall’s tau-c = $-0.10, p = .169$), suggesting that there was not a significant relationship between the two variables. Most of the organizations for both emerging systems and traditional systems were non-financial services. Table 2 presents the findings of the cross-tabulations.

Table 2

Cross-Tabulation Between Type of System and Description of Organization

Timeframe	Emerging system (<i>n</i> = 98)		Traditional system (<i>n</i> = 129)		Lambda		Kendall's tau-c	
	<i>n</i>	%	<i>n</i>	%	Value	<i>p</i>	Value	<i>p</i>
					0.03	.485	-0.10	.169
1. Which one of the following best describes your organization?								
Accounting/audit	5	5.1	6	4.7				
Business banking	8	8.2	6	4.7				
Capital markets/investment banking	1	1.0	5	3.9				
Insurance	5	5.1	6	4.7				
Lending/credit	0	0.0	5	3.9				
Payments	7	7.1	7	5.4				
Private banking	5	5.1	3	2.3				
Private equity/venture capital	2	2.0	2	1.6				
Retail banking	6	6.1	6	4.7				
Trading/brokerage	1	1.0	0	0.0				
Wealth/fund/asset management	1	1.0	0	0.0				
Other financial services	10	10.2	10	7.8				
Nonfinancial services	47	48.0	73	56.6				

For Survey Question 4, the cross-tabulations between type of system and largest financial concerns was not statistically significant (Lambda = 0.08, $p = .161$; Kendall's tau-c = 0.14, $p = .054$), suggesting that there was not a significant relationship between the two variables. The most prevalent financial concern for emerging systems was “dealing with uncertainty over new financial regulations” ($n = 32, 33.0\%$). The most prevalent financial concern for traditional systems was “maintaining cash flow and liquidity” ($n = 45, 35.7\%$). Table 3 presents the findings of the cross-tabulations.

Table 3

Cross-Tabulation Between Type of System and Financial Concerns

Timeframe	Emerging system (<i>n</i> = 98)		Traditional system (<i>n</i> = 129)		Lambda		Kendall's tau-c <i>p</i>	
	<i>n</i>	%	<i>n</i>	%	Value	<i>p</i>	Value	<i>p</i>
4. Over the next 12 months, which of the following issues do you foresee as the largest financial concerns for your business/users?					0.08	.161	0.14	.054
Maintaining cash flow and liquidity	24	24.7	45	35.7				
Managing risks on price fluctuations on exchange rates, interest rates, and commodities	16	16.5	21	16.7				
Dealing with uncertainty over new financial regulations	32	33.0	22	17.5				
Restrictions on diversity credit from lenders	7	7.2	14	11.1				
Market liquidity	12	12.4	19	15.1				
Managing risks from international credit markets	6	6.2	5	4.0				

For Survey Question 5, the cross-tabulations between type of system and largest operational concerns was not statistically significant (Lambda = 0.03, $p = .486$; Kendall's tau-c = 0.01, $p = .871$), suggesting that there was not a significant relationship between the two variables. The most prevalent operational concern for emerging systems was “adopting long-term credit raising plans for the business” ($n = 16$, 16.7%). The most prevalent operational concern for traditional systems was “Accessing credit” ($n = 21$, 16.8%). Table 4 presents the findings of the cross-tabulations.

Table 4

Cross-Tabulation Between Type of System and Operational Concerns

Timeframe	Emerging system (<i>n</i> = 98)		Traditional system (<i>n</i> = 129)		Lambda		Kendall's tau-c <i>p</i>	
	<i>n</i>	%	<i>n</i>	%	Value	<i>p</i>	Value	<i>p</i>
5. Over the next 12 months, which of the following issues do you foresee as the biggest operational concerns for your business?					0.03	.486	0.01	.871
Accessing credit	10	10.4	21	16.8				
Managing day-to-day currency risk	15	15.6	15	12.0				
Raising short-term operating capital	11	11.5	8	6.4				
Investing in short-term capital	12	12.5	16	12.8				
Adopting long-term credit raising plans for the business	16	16.7	16	12.8				
Negotiating terms and conditions for loans	7	7.3	17	13.6				
Attracting investors and raising capital and equity from the public and private markets	12	12.5	13	10.4				
Accessing the public debt markets	9	9.4	8	6.4				

Reducing the risks of litigation when releasing company disclosures to analysts	4	4.2	11	8.8
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For Survey Question 6, the cross-tabulation between the type of system and reasons for increased costs or challenges was not statistically significant (Lambda = 0.05, $p = .258$; Kendall's tau-c = 0.13, $p = .079$), suggesting that there was not a meaningful relationship between the two variables. The most prevalent reason for increased costs or challenges for emerging systems was "changes to money market mutual funds" ($n = 22$, 23.2%). The most prevalent reason for increased costs or challenges for traditional systems was "changes to money market mutual funds" ($n = 35$, 28.0%). Table 5 presents the findings of the cross-tabulations.

Table 5

Cross-Tabulation Between Type of System and Reasons for Increased Costs or Challenges

Timeframe	Emerging system (<i>n</i> = 98)		Traditional system (<i>n</i> = 129)		Lambda		Kendall's tau-c <i>p</i>	
	<i>n</i>	%	<i>n</i>	%	Value	<i>p</i>	Value	<i>p</i>
6. Thinking about the past 2-3 years, which of the following specific regulatory changes have caused increased costs or other challenges for your business?					0.05	.258	0.13	.079
Increased bank capital charges	18	18.9	17	13.6				
Increased regulation of derivatives	10	10.5	15	12.0				
Changes to money market mutual funds	22	23.2	19	15.2				
Inability to hold cash deposits	12	12.6	13	10.4				
Restrictions on the ability to engage in physical commodity activities	11	11.6	15	12.0				
Other	10	10.5	11	8.8				
None	12	12.6	35	28.0				

For Survey Question 9, the cross-tabulations between the type of system and response to changes to financial markets was not statistically significant (Lambda = 0.02, $p = .629$; Kendall's tau-c = -0.14, $p = .072$), suggesting that there was not a significant relationship between the two variables. The most prevalent responses to changes to financial markets for emerging systems were “made cuts in other areas, including personnel” (n = 18, 18.9%) and “substituted or reduced the types of financial services received” (n = 18, 18.9%). The most prevalent responses to changes to financial markets for traditional systems were “increased prices for customers and consumers” (n = 24, 18.9%) and “made cuts in other areas, including personnel” (n = 24, 18.9%). Table 6 presents the findings of the cross-tabulations.

Table 6

Cross-Tabulation Between Type of System and Response to Changes to Financial Markets

Timeframe	Emerging system (<i>n</i> = 98)		Traditional system (<i>n</i> = 129)		Lambda		Kendall's tau-c	
	<i>n</i>	%	<i>n</i>	%	Value	<i>p</i>	Value	<i>p</i>
9. Which of the following actions has your business taken as a result of changes to the financial services markets?					0.02	.629	-0.14	.072
Increased prices for customers and consumers	16	16.8	24	18.9				
Delayed or canceled planned investments	4	4.2	13	10.2				
Decreased the types of services offered to clients and customers	14	14.7	20	15.7				
Made cuts in other areas, including personnel	18	18.9	24	18.9				
Increased risk company is exposed to	14	14.7	14	11.0				
Substituted or reduced the types of financial services received	18	18.9	13	10.2				
Substituted or reduced financial institutions providing services	6	6.3	9	7.1				

Absorbed the higher costs	5	5.3	10	7.9
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For Survey Question 10, the cross-tabulations between the type of system and expectation for regulations in the financial service sector was not statistically significant (Lambda = 0.02, $p = .247$; Kendall's tau-c = 0.09, $p = .221$), suggesting that there was not a significant relationship between the two variables. The most prevalent responses to expectation for the regulations in financial service sector in both emerging systems and traditional systems were "neither/unsure" ($n = 39, 41.1\%$; $n = 43, 34.4\%$). However, the remaining participants for both emerging and traditional systems had positive outlooks to the regulations for regulations in the financial services. Table 7 presents the findings of the cross-tabulations.

Table 7

Cross-Tabulation Between Type of System and Outlook for Financial Regulations

		Emerging system ($n = 98$)		Traditional system ($n = 129$)		Lambda		Kendall's tau-c	
		n	%	n	%	Value	p	Value	p

10. Do you expect the regulations for the financial services sector to improve or worsen the outlook for your business over the next 2-3 years?

0.02 .247 0.09 .221

Significantly improve	10	10.5	17	13.6
Somewhat improve	27	28.4	41	32.8
Neither/unsure	39	41.1	43	34.4
Somewhat worsen	11	11.6	20	16.0
Significantly worsen	8	8.4	4	3.2

Frequencies Distributions

For Survey Question 2, most participants in emerging systems and traditional systems identified cash management as a financial service used in their businesses. Table 8 presents the findings of the frequency distribution.

Table 8

Frequency Distribution for Financial Services that Businesses are Using

	Emerging system (<i>n</i> = 98)	Traditional system (<i>n</i> = 129)
	<i>N</i>	<i>n</i>

2. Select the financial services that you use in your business for:

Cash management	54	87
Obtaining short-term loans	12	21
Obtaining long-term loans	17	20
Issuing long-term debt	11	13
Trade financing	13	22
Purchasing derivatives	8	17
Equity issuance	7	10
Issuing commercial paper	11	9

For Survey Question 3, most participants in emerging systems identified having a broad spectrum of services as an important financial bank attribute ($n = 37$). Most participants in traditional systems identified having a well-established local or regional footprint as an important financial bank attribute ($n = 52$). Table 9 presents the findings of the frequency distribution.

Table 9

Frequency Distribution for Important Financial Bank Attributes

	Emerging system ($n = 98$)	Traditional system ($n = 129$)
	N	n

3. Select the financial/bank attributes that are important in your company:

Has a well-established local or regional footprint	26	52
Has a wide spectrum of services	37	46
Has a regional presence	26	31
Has a large domestic footprint	23	32
Specializes in specific products	28	35
Has a large global footprint	16	21

For Survey Question 7, there was a large variability of responses to positive and negative regulations for emerging and traditional systems. Many favorable regulations were also noted as negative regulations. Table 10 presents the findings of the frequency distribution.

Table 10

Frequency Distribution for Positive and Negative Financial Regulations

	Emerging system (<i>n</i> = 98)	Traditional system (<i>n</i> = 129)
	<i>N</i>	<i>n</i>
7. In recent years, many new financial rules and regulations have been implemented. Which regulations have had a positive impact on your business?		
Basel III	8	14
SIFI Regulations	16	27
SEC Money Market Fund Reforms	28	41
The Volker Rules	25	29
The Liquidity Coverage Ratio	25	24
PCAOB Audit Standards	12	9
US and EU Derivative Rules	20	24
8. In recent years, many new financial rules and regulations have been implemented. Which regulations have had a negative impact on your business?		
Basel III	9	13
SIFI Regulations	17	23
SEC Money Market Fund Reforms	26	28
The Volker Rules	21	32
The Liquidity Coverage Ratio	25	25
PCAOB Audit Standards	17	18
US and EU Derivative Rules	17	20

Note. SEC = Securities and Exchange Commission, SIFI = systemically important financial institution, PCAOB = Public Company Accounting Oversight Board

Summary

The purpose of this quantitative, correlational study was to examine the relationship between financial regulations on blockchain and emerging financial technologies compared to the effects of regulations on traditional financial systems. In this chapter, the findings of the data collection and analysis were presented. The distribution of demographics was first presented. Then cross-tabulations and frequency distributions using the Lambda and Kendall's Tau c test were used to address the research question proposed for the study. None of the cross-tabulations were statistically significant, suggesting that there was not a relationship between the type of system and financial regulations.

The online survey was conducted from February 12, 2019, to March 8, 2019. Questions covered topics such as economic outlook, regulatory challenges, cash operations, relationships with financial institutions, and what types of institutions companies use for different financial functions. Not much research has been conducted about the regulatory environment of blockchain technology and other financial technologies since the phenomenon is relatively new. The findings in this research about both the emerging financial systems and the traditional systems are continued in the next chapter to deepen knowledge about the subject.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative study was to examine how regulatory constraints impact traditional financial systems and how that compares to regulatory effects on emerging financial systems using organizational economics theory. Existing regulations and laws may not cover the scope and scale of emerging financial technologies; thus, there is a need to study possible solutions that can help policy administrators in making informed decisions about innovations like financial technologies and how they can be useful for a positive social change. Through quantitative methods, a comparative analysis of traditional financial systems and emerging financial systems was conducted to assess the impact of financial regulation on the U.S. financial sector. None of the cross-tabulations and frequency distributions were statistically significant, suggesting that there was not a relationship between the type of system and financial regulations.

An online survey was conducted from February 12, 2019 to March 8, 2019 to collect data from a select relevant population. Questions covered topics such as economic outlook, regulatory challenges, cash operations, relationships with financial institutions, and what types of institutions companies use for different financial functions. Cross-tabulations and frequency distributions were used to analyze the results of the data collected for the study. A total of 372 participants consented to participate in the research. After cleaning the comebacks of invalid responses, the final sample consisted of 227 participants, which is more than the G-Power calculations' suggestion of 193 sample size.

The distribution of gender was approximately equal for emerging systems and traditional systems.

Interpretation of Findings

The results were based on a correlational analysis to examine the relationship between the effects of regulations on traditional financial systems compared to blockchain and emerging financial technologies. The findings after conducting cross-tabulations and frequency distributions on a final sample of 227 participants were not statistically significant. The findings indicated there was not a significant relationship between the type of financial system and financial regulations; thus, the null hypothesis was confirmed, which indicates that regulations will not have the same impact on blockchain and emerging financial systems as it did with traditional financial systems. The findings were based on data collected from an online survey hosted on Survey Monkey. Survey questions on traditional and emerging financial systems consisted of 10 questions on traditional financial systems (see Appendix A) and 10 questions on emerging financial systems (see Appendix B). Type of financial system and each of the regulatory effects were cross-tabulated. Statistical significance of the statistical tests was evaluated at the conventional level, $\alpha = .05$.

The demographic data collected showed that the gender distribution of respondents was approximately equal for emerging systems and traditional systems. The most prevalent age group for emerging systems and traditional systems was 25 to 34 ($n = 28, 28.6\%$; $42, 32.6\%$, respectively). The data showed that most of the participants in both samples were White/Caucasian ($n = 61, 62.2\%$ for emerging systems and $n = 65,$

50.4%). There was a mix of married and single participants for both emerging and traditional systems. Demographic data also showed that participants in the traditional systems had a higher average salary in comparison to participants in the emerging systems.

Cross-Tabulations

Survey Question 1 regarded a description of the organization of the respondents. The cross-tabulations between type of system and description of organization were not statistically significant (Lambda = 0.03, $p = .485$; Kendall's tau-c = -0.10, $p = .169$). This finding implies that there was not a substantial relationship between the two variables. Most of the organizations for both emerging systems and traditional systems provided non-financial services.

Survey Question 4 related to issues in the past 12 months that participants saw as being of the largest concern. The cross-tabulations between type of system and largest financial concerns were not statistically significant (Lambda = 0.08, $p = .161$; Kendall's tau-c = 0.14, $p = .054$). This suggests that there was not a significant relationship between the two variables. The most common financial concern for emerging systems was "dealing with uncertainty over new financial regulations" ($n = 32, 33.0\%$). The most prevalent financial concern for traditional systems was "maintaining cash flow and liquidity" ($n = 45, 35.7\%$). Thus, the most pressing concern for the two financial systems in the past 12 months are not the same.

Survey Question 5 related to the biggest operational issues in the past 12 months that participants saw as being of the most concern. The cross-tabulations between type of

system and largest operational concerns were not statistically significant ($\text{Lambda} = 0.03$, $p = .486$; Kendall's tau-c = 0.01, $p = .871$). The results indicate that there was not a significant relationship between the two variables. The most prevalent operational concern for emerging systems was “adopting long-term credit raising plans for the business” ($n = 16$, 16.7%). The most prevalent operational concern for traditional systems was “accessing credit” ($n = 21$, 16.8%). The most important operation concern for the two financial systems in the past 12 months are not the same.

Survey Question 6 pertained to which specific regulatory changes have caused increased costs or other challenges for their business in the past 2-3 years. The cross-tabulation between the type of system and reasons for increased costs or challenges was not statistically significant ($\text{Lambda} = 0.05$, $p = .258$; Kendall's tau-c = 0.13, $p = .079$). This means there was not a significant relationship between the two variables. The most prevalent reason for increased costs or challenges for emerging systems was “changes to money market mutual funds” ($n = 22$, 23.2%). The most prevalent reason for increased costs or challenges for traditional systems was “changes to money market mutual funds” ($n = 35$, 28.0%). Thus, the most prevalent reason for increased costs or challenges for the emerging and traditional financial systems are not the same in the past 2 – 3 years.

Survey Question 9 collected data on actions that participants' business had taken as a result of changes to the financial services markets. The cross-tabulations between the type of system and response to changes to financial markets were not statistically significant ($\text{Lambda} = 0.02$, $p = .629$; Kendall's tau-c = -0.14, $p = .072$). This implies that there was not a significant relationship between the two variables. The most prevalent

responses to changes to financial markets for emerging systems were “made cuts in other areas, including personnel” ($n = 18, 18.9\%$) and “substituted or reduced the types of financial services received” ($n = 18, 18.9\%$). The most prevalent responses to changes to financial markets for traditional systems were “increased prices for customers and consumers” ($n = 24, 18.9\%$) and “made cuts in other areas, including personnel” ($n = 24, 18.9\%$), which shows the differences in actions that business in the emerging and traditional financial systems have taken as a result of changes to the financial services markets.

Survey Question 10 was about whether they expect the regulations for the financial services sector to improve or worsen the outlook for their business over the next 2-3 years. The cross-tabulations between the type of system and expectation for regulations in the financial service sector were not statistically significant (Lambda = 0.02, $p = .247$; Kendall’s tau-c = 0.09, $p = .221$). This suggests that there was not a significant relationship between the two variables. The most prevalent responses to expectation for the regulations in financial service sector in both emerging systems and traditional systems were “neither/unsure” ($n = 39, 41.1\%$; $n = 43, 34.4\%$). However, the remaining participants for both emerging and traditional systems had positive outlooks for regulations in the financial services sector.

Frequencies Distributions

Survey Question 2 required respondents to select the financial services they use for business. Most participants in emerging systems and traditional systems identified cash management as the choice of financial service used in their businesses. The

emerging financial system had ($n = 54$), whereas the traditional financial systems had a higher number between the two ($n = 87$). The numbers varied between the two financial systems for each variable.

Survey Question 3 required respondents to select financial or bank attributes that are important in their company. Most participants in emerging systems identified having a wide spectrum of services as an important financial bank attribute ($n = 37$). Most participants in traditional systems identified having a well-established local or regional footprint as an important financial bank attribute ($n = 52$). Participants selected different financial or bank attributes that were important in their company between the two financial systems.

Survey Questions 7 and 8 required respondents to select which regulations have had a positive and negative impact on their businesses, respectively. The responses varied between positive and negative regulations for emerging and traditional systems. Some selected positive regulations, which were noted as negative regulations by other participants.

This study offers an insight into the future of what a full-scale regulatory environment could look like by collecting, analyzing, and comparing data about the two financial systems. The outcome of this research indicated that the effects of the current regulatory environment on the traditional financial systems would not be the same as on emerging financial systems. This study filled at least one of the gaps in the literature on the need to compare emerging financial technologies with traditional financial systems and current regulatory approaches. Thus, the findings extended knowledge in the

discipline and inform researchers and policymakers about the critical impacts of regulations (see McKinlay et al., 2018; Yeoh, 2017).

The effects of the regulatory environment on emerging financial technologies are not as clear as they are on traditional financial systems (Yeoh, 2017). Existing literature shows that the financial regulatory environment affects blockchains and emerging financial technology differently than it affects traditional financial systems partly because blockchains and emerging financial technology are relatively new (Wright & De Filippi, 2015; Yeoh, 2017). Newer technologies are generally not restricted or prohibited by regulators because blockchain technology involves decentralized or distributed ledger systems to which current centralized regulation systems may not apply (Hwa, 2016). Therefore, regulations and laws related to cryptocurrencies and blockchain technology are themselves emerging in response to technological advances (De Filippi & Hassan, 2016; McKinlay et al., 2018; Tasca et al., 2016; Yeoh, 2017). Additionally, guidelines and conventions for the use of cryptocurrencies and blockchain technology are often influenced by stakeholders rather than actual regulations (De Filippi & Hassan, 2016; McKinlay et al., 2018; Tasca et al., 2016; Yeoh, 2017).

The findings of the current study support the findings of previous literature that regulations do not have the same effects on blockchains and emerging financial systems as they do on traditional financial systems. For example, Brito, Shadab, and Castillo (2014) conducted a study on financial transactions and financial instruments of interest to regulators, including new bitcoin-denominated instruments, decentralized markets, decentralized exchanges, and traditional securities and derivatives. Brito et al. discussed

the classification of virtual currencies for regulation compared to that of traditional currencies that rely on intermediaries such as the banks and security exchanges.

Implications of Findings

The findings of this study suggest that blockchains and emerging financial systems are not influenced by regulation in the same ways that traditional financial systems are. This revelation from the findings can inform policy makers and the business community to strategize in ways to regulate emerging financial technology to improve on the benefits of these innovations to society (Bussmann, 2017). With improved understanding of how regulatory impacts may differ, the theory, research, and practice implications are addressed in the following sections.

Implications for Theory

This study is significant in advancing the public finance elements of organizational economic theory. Public policy administrators and regulators who help enact, interpret and enforce national laws and regulations that govern banks, insurance companies, and investment companies depend on the framework of this theory (Amadeo, 2018). The findings in this research reiterate that new and improved regulations that cover the scope and scale of emerging financial systems are a must. The theory adds to research about emerging financial systems by aiding to uncover opportunities that can serve as a guide for public policy makers and corporate decision-makers to consider when making strategic decisions in this revolutionary arena.

With the results showing that the current rules and regulations are not substantial with the emerging financial innovations, elements of the organizational economic theory

like transactional costs that guides government expenditure should be explored in regulating the financial sector. To regulate financial technology, obligations can be tailored to match specific risks by setting calibrations to capture the particular risks involved and to provide the necessary protection either in terms of capital or liquidity and limiting debt or leverage levels (De Filippi & Potts, 2018). Transactional costs can be standardized and controlled, which could allow a more specific set of relevant, necessary, and accurate requirements to be imposed.

Agency theory considers the need for policy makers to intervene in the industry using financial regulations. Findings from this research point to the fact that the current regulatory environment will not adequately support the financial technology era. Since the 2008 financial crisis, regulators have increasingly put pressure on the sector in part because agency theory stipulates the appropriate timing of government intervention and how that might be imposed (Tasca et al., 2016). Regulatory oversight changes covered business and financial service companies. To extend this interest to cover emerging financial innovations fully, supervision by authorities need to become more efficient with more accurate reporting of data by firms in near real time. The use of financial technology tools will allow for necessary analytical systems to be developed within authorities to map data reports and highlight concerns. Through the automation of compliance, supervision can move from being static and retroactive with considerable delays to become more precise, accurate, and effective with almost real-time monitoring and collection (De Filippi & Potts, 2018).

Contractual theory consideration includes how the government can centralize contractual arrangements to provide oversight and the best cost value mechanics while reconciling with the decentralized nature of blockchains and similar financial technologies. Emerging financial technology is currently driving new business models through sharing economies, which have already impacted transactions for hotel rooms, cars, and taxis. Sharing economies allow for decentralized asset ownership where information technology is used to match capital providers with users, and the bank is not used as the intermediary (Tasca et al., 2016). Regulators typically use the intermediary banks to provide oversight and enforce compliance. Emerging financial technologies interrupt this traditional product-and-service chains, making it difficult to regulate, monitor, and ensure compliance. The findings in this research confirm this sector difficulty by uncovering that the current regulatory environment is inadequate to support emerging financial systems. For instance, De Filippi and Potts (2018) indicated that financial technology operators should assist by setting up and developing appropriate trade associations and ensure that they act responsibly and reflect the full range of interests of stakeholders with oversight from a governmental agency.

Implications for Research

The findings of this study suggest that regulations are not influencing blockchains and emerging financial systems in the same ways as traditional financial systems are. Thus, it is important that researchers find new and improved methods and models to study emerging financial innovations since they are influenced by regulations differently than traditional financial systems are. These changes may include research being

proactive rather than reactive and increased focus on decentralized populations to conform to the decentralized nature of innovative technologies.

The research was designed to examine the hypothesis that regulations will have the same effects on blockchains and emerging financial systems as they do on traditional financial systems. The null hypothesis for this study was that regulations would not have the same effects on blockchain and emerging financial systems as they do on traditional financial systems. The dependent variable was regulatory effects, and the independent variables were emerging financial systems and traditional financial systems. The null hypothesis, as discussed, was confirmed since the analysis of the survey results with cross-tabulations and frequency distributions proved not to be significant. Emerging technologies have innovative financial systems that make it challenging for the existing financial regulations to cover them adequately.

Previous research on the subject includes a study by Au and Kauffman (2008), which examined the application of emerging wireless technology for mobile payments. Au and Kauffman sought to provide insights to senior management and stakeholders on how to adapt to a world of innovations that continue to change business processes, information management, security, investments, and business value. The study also offered a model which allowed identification of applicable theory and pertinent stakeholders in analyzing social issues, business processes, firm concerns, customer needs, modern trends, and market needs. Similarly, Au and Kauffman cautioned readers to notice that although most similar economic forces work-like related technology

applications, the systems may require different regulatory environment and tools to be effective.

Avgouleas (2015) provided a detailed, up-to-date survey of the purpose and nature of financial regulation. Avgouleas investigated key terms linked to financial innovation, the costs, and benefits of financial innovation, and how financial institutions can engage in regulatory tax and regulatory arbitrage. Avgouleas also examined the regulatory model for financial innovation and its costs, benefits, and risks with consideration to the global financial crisis of 2008 to emphasize the grave risks that stem from the shadow-banking industry. The framework offered by the study served as a policy guide for post-2008 financial, technological innovations utilized by businesses, government, and academia.

The findings of this current study will inform policymakers and the business community to strategize in ways to use adequate regulations during the financial technology era to improve on financial services to better serve society (Bussmann, 2017). Financial risks continue to change and to mitigate such risks; regulatory bodies are responsible for producing modern and technologically adept regulations to cover the scope and scale of the entire sector adequately. The sole goal of regulation in the financial sector is to ensure economic growth as well as economic stability to benefit the community. The information uncovered by this study on how traditional and emerging financial systems require different bodies of regulation avails reliable information and data sources for regulators and public administrators to consider in decision making that influences the livelihoods of most members of the society. Policy makers and

administrators have insights on applicable regulatory effects on businesses and institutions such as impacts on organizational composition, structure choices, performance metrics, and profitability.

Implications for Practice

This study contributes to and helps advance practice and policy administration of financial technology by making information available to regulators, stakeholders, and the general public (Au & Kauffman, 2008; Cusa & Wilner, 2017). In an era of adjusting to financial, technological innovations, the results of the study help identify procedures needed to make financial policies equitable. Regulations can be targeted on how they can affect businesses, organizations, governments, and members of the broader society (Yermack, 2017). Also, practitioners and other researchers are exposed to an improved understanding of modern research topics and how they do not necessarily conform to traditional practices.

The results obtained in this study fill a gap by providing information on potential adequate and effective financial sector regulations. Policymakers can infer from the findings of how to adequately regulate blockchains and other financial technologies to better benefit government agencies, the private industry, and all stakeholders. There is an urgent demand for adequate regulations for an industry that is likely to change traditional banking, finance, and insurance in this technology-driven culture. Some of the solutions being provided to satisfy business needs include innovations like Blockchain, crowdfunding, peer-to-peer lending, Apple Pay or Samsung Pay, and other mobile payments solutions.

The use of a quantitative research method for a comparative analysis allows for the results to be generalized even as the subject continues to be explored based on the findings of this research. Through effect statistics, there is a pathway to generalize about how financial technologies will compete with established economic institutions such as businesses, marketplaces, networks, banks, central banks, and government organizations. It is also possible to forecast opportunities and setbacks of the full-scale regulation of emerging financial, technological advancements. A qualitative study would produce findings that are not conclusive and cannot be used to generalize about the population or subject of interest (Bell, Bryman, & Harley, 2018).

Limitations of the Study

Emerging financial technologies are financial innovations that are relatively new. Collecting useful data from such an industry is challenging. Although the attempt was made in good faith to identify and reach suitable participants, data gathered from an online survey may be biased because of the involvement of other industries other than the financial institutions. This approach possibly limited the generalizability, validity, and reliability of the study (Pearl & Bareinboim, 2014).

External Validity

The computational and statistical methods devised in this study were designed to produce valid generalizations to other people and situations. Situational factors that possibly influenced the validity of this study includes invalid responses from participants. A total of 372 participants consented to participate in the research, but 145 did not

respond to any portion of the questionnaire. These cases were removed from further analysis reducing the final sample to 227 participants, which lowered the sample size.

Internal Validity

The study made use of operational variables that has a causal association. Efforts were made to ensure that the inferences made possessed internal validity. It is possible that participants did pick among the alternative explanations provided without the best understandings. Participants were selected from online populations with different characteristics if they qualified as part of the intended pool of participants to avoid selection bias. This also poses a limitation since the researcher does not have adequate means and resources to validate the authenticity of the participants from an online survey.

Construct Validity

The study was constructed to compare two financial systems and how regulations could affect them. This type of study about possible effects comparing two dependent variables to an independent variable are confusing to participants. A simpler design for this study could be a grounded theory using a qualitative study. Since the results from such a study could not be empirically generalized to all populations of interest, a quantitative correlational study was used to compare regulatory effects in the financial systems. Analysis from an online survey is being relied on to generalized across different tasks, groups, and settings.

Recommendations

Recommendations for Action

This study aims at comparing the financial regulatory impact on traditional financial systems and emerging financial systems. Current regulations and laws are not adequate in covering emerging financial technologies (financial technologies). Insights from this study can serve as a reference for policy officers in making informed decisions about financial technology innovations. Since the 2008 financial crises, the United States government has put in place many regulations and guidelines to help avoid such as calamity from happening. One such governmental agencies tasked with ensuring a protected economy is the Financial Stability Oversight Council (Khashanah & Miao, 2011). For these agencies and their private counterparts to succeed in minimizing the risks of an economic meltdown, new and improved regulatory measures are required.

A better and more befitting regulatory system is required for emerging financial systems since the existing regulations do not cover the scope and scale of Blockchain and financial technologies. The findings from this study also confirm that traditional systems and emerging systems do not conform to the same guidelines and methods. Innovative tools and methods should be employed to assist risk management and control within financial institutions and the supervision of firms by the authorities for adequate systems oversight. New laws and amendments to existing laws governing the regulation and supervision of financial institutions groups are required to ensure they cover financial technology structures.

Recommendations for Further Research

This quantitative correlational study was designed to examine the relationship between the effects of regulations on blockchain and emerging financial systems and regulatory effects on traditional financial systems. The results showed that there was not a substantial relationship between the type of financial system and financial regulations. Cross-tabulations and frequency distributions on 227 participants responses were conducted after 145 responses were removed. Although a total of 372 online survey respondents were collected initially, a lack of adequate control and supervision owing to the nature of using online surveys hindered having a larger sample size for the study. I recommend a different study that allows the researcher to have more control over the selection and supervision of respondents to ensure the final sample size is within the researcher's control. Paper surveys, targeted email surveys, telephone interviews, or face-to-face interviews are examples of recommended methods to control sample size.

A limitation identified for this study was the fact that collecting practical data for an emerging industry is challenging. Aside from the issue of not having oversight on the final sample size for this study, data gathered from an online survey may be biased because of the involvement of other industries other than the financial institutions. There were several reasons for not choosing a qualitative design for this study, although it allows the population to be better controlled. Some of the reasons included that the information gathered is not always empirically measurable and that the sample size is limited in most cases, which affects the generalizability and reliability of the study. However, for the sake of gaining further insights into the subject, I recommend a

qualitative study which promises trustworthiness and validity based on closer contact with the sample population. Qualitative research could also be used to explore and help identify new factors related to policies and regulations of emerging financial technologies.

Additionally, I recommend a case study that would involve multiple data sources on a specific technology or context about regulations. I also recommend research on specific types of emerging technology such as crowdfunding, peer-to-peer lending, Apple Pay or Samsung Pay, and other mobile payment systems about regulations in the United States.

Implications

The findings of this study are as a result of cross-tabulations and frequency distributions on data collected to answer research questions about whether there is a substantial relationship between the type of financial system and financial regulations or not. Tests results and study analysis indicated that regulations would not influence blockchains and emerging financial systems in the same ways as traditional financial systems are. The findings can influence stakeholders such as the various business and regulatory communities involved with financial technologies, Blockchain, and other emerging financial innovations, in addition to their regulatory and oversight organizations. Practical implications include effects on society and how innovative products will further mold the way of life. There are theoretical implications also because financial systems are a vital part of research and development in industry, government, and academia.

Findings from this research can help to fill a gap in the research surrounding how to regulate emerging financial systems such as blockchains and other innovative financial tools. Through a comparative analysis of how regulations affect traditional and emerging financial systems, the data is now available for reference in future studies and analysis. Issues raised in this research include regulations that impact financial systems, the lack of adequate regulations, the competitive advantage of new financial technology over the controlled financial systems, and a comparative analysis after effective regulations are put in place. Based on technological advancement and the need for businesses to innovate to be more profitable, emerging financial systems and mobile financial services offerings have made it even more difficult for existing financial regulations to cover them adequately. Findings from this study can inform policymakers and the business community to strategize in ways to use adequate regulations to reduce risks substantially in businesses, government, and academia.

The study results show that the current rules and regulations are not significant for emerging financial innovations. Public finance foundations of organizational, economic theory, which involve economic logic and methods, were used to analyze the findings based transactional cost theory, agency theory, and contract theory (Önday, 2016a, 2016b). Transactional costs theory is a guide for government expenditure to make it more effective. By streamlining the needs of government and the possible risks, regulation can employ the use of financial technology tools to make governance and oversight less of a burden in cost and effort for all stakeholders. Agency theory suggests the need for policymakers to intervene in the industry through regulations. After financial crises such

as the 2008 crisis, regulatory oversight changes covered business and financial service companies. Automation of compliance will allow supervision to become more precise, accurate, and effective with almost real-time monitoring. Contractual theory helps understand how the government can centralize contractual arrangements to provide oversight and the best cost value mechanics. Because of the influence of financial technology, regulators are faced with the challenge of regulating decentralized financial systems with methods that depend on a centralized system. This study indicates that the current regulatory environment is inadequate to support emerging financial systems.

The implication of this study with regards to social changes is enormous. The 2007 to 2009 financial crisis contributed to an increase in unemployment, higher poverty, lower income, and a decrease in socioeconomic growth (Khashanah & Miao, 2011). The study's findings give regulators and administrators the tools to adequately provide guidance and oversight to control financial systems from causing financial stress to the economy and society.

In exploring the influence of blockchains and other emerging financial technology on businesses and society as a whole, the effects of regulatory constraints in the financial sector were studied. The importance of policy administrators acting to bring about positive social change to improve human or social conditions is showcased. Individuals, institutions, and governments will be better protected with information that this study provided, and it can help facilitate further research.

Conclusions

Comparative analysis indicated that regulatory and supervisory issues faced by traditional financial systems do not translate directly to new financial technology. The results suggest that emerging financial systems require different approaches to regulatory oversight than traditional financial systems (Davidson et al., 2016). There is currently a lack of adequate and full-scale regulation of blockchains and other financial technologies. Financial regulations include national laws and legislation governing banks, insurance companies, and investment companies for safeguarding customers from fraudulent acts and financial risks (Amadeo, 2018).

In evaluating the regulatory framework of blockchains and other emerging financial technologies by comparing them to traditional financial systems, new knowledge on current and future regulatory challenges for emerging financial systems have been uncovered. Public and private policy administrators will be better equipped with information on the subject to be efficient and effective in executing their duties for all stakeholders to include the communities they serve. Forecasting possible opportunities and setbacks can aid in assessing how these new technologies will compete with established economic institutions such as businesses, marketplaces, networks, banks, central banks, and government organizations. Emerging financial systems are technology solutions with startups that have changed and improved the way finance, banking, and insurance industries do business and are one of the largest growth industries in the world of finance and technology (di Castri & Plaitakis, 2017; Schueffel, 2017). They provide a promise of greater security, faster transactions, and revolutionary options for commerce,

financial services, and insurance. There is a need for regulators and public policy administrators to steer these innovations to be useful for a positive social change.

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Appendix A: Regulatory Effects on Traditional Financial Systems

About the Survey

Businesses rely on an adequately regulated environment to spur economic growth. The past years have seen financial crises that have called for regulatory reforms intended to improve on the resilience of the United States financial systems. Some of the policies have negatively influence businesses. The purpose of this survey is to assess the effects of financial regulatory impact on the traditional financial environment. There are 10 questions which should take only a few minutes to answer.

1. Which one of the following best describes your organization?

- a. Accounting/Audit
- b. Business banking
- c. Capital markets/investment banking
- d. Insurance
- e. Lending/Credit
- f. Payments
- g. Private banking
- h. Private equity/venture capital
- i. Retail banking
- j. Trading/brokerage
- k. Wealth/fund/asset management
- l. Other financial services
- m. Non-financial services

2. Select the financial services that you use in your business for:
 - a. Cash management
 - b. Obtaining short-term loans
 - c. Obtaining long-term loans
 - d. Issuing long-term debt
 - e. Trade financing
 - f. Purchasing derivatives
 - g. Equity Issuance
 - h. Issuing commercial paper
3. Select the financial/bank attributes that are important to your company:
 - a. Has a well-established local or regional footprint?
 - b. Has a wide spectrum of services?
 - c. Has a regional presence?
 - d. Has a large domestic footprint?
 - e. Specializes in specific products?
 - f. Has a large global footprint?
4. Over the next 12 months, which of the following issues do you foresee as the biggest financial concerns for your business/users?
 - a. Maintaining cash flow and liquidity
 - b. Managing risks on price fluctuations on exchange rates, interest rates, and commodities
 - c. Dealing with uncertainty over new financial regulations

- d. Restrictions on diversity credit from lenders
 - e. Market liquidity
 - f. Managing risks from international credit markets
5. Over the next 12 months, which of the following issues do you foresee as the biggest operational concerns for your business?
- a. Accessing Credit
 - b. Managing day-to-day currency risk
 - c. Raising short-term operating capital
 - d. Investing in short-term capital
 - e. Adopting long-term credit raising plans for the business
 - f. Negotiating terms and conditions for loans
 - g. Attracting investors and raising capital and equity from the public and private markets
 - h. Accessing the public debt markets
 - i. Reducing the risks of litigation when releasing company disclosures to analysts
6. Thinking about the past 2-3 years, which of the following specific regulatory changes have caused increased costs or other challenges for your business?
- a. Increased bank capital charges
 - b. Increased regulation of derivatives
 - c. Changes to money market mutual funds
 - d. Inability to hold cash deposits

- e. Restrictions on the ability to engage in physical commodity activities
- f. Other
- g. None

7. In recent years, many new financial rules and regulations have been implemented.

Would you say that the following regulations have had a positive impact on your business?

- a. Basel III
- b. SIFI Regulations
- c. SEC Money Market Fund Reforms
- d. The Volker Rule
- e. The Liquidity Coverage Ratio
- f. PCAOB Audit Standards
- g. US and EU Derivative Rules

8. In recent years, many new financial rules and regulations have been implemented.

Would you say that the following regulations have had a negative impact on your business?

- a. Basle III
- b. SIFI Regulations
- c. SEC Money Market Fund Reforms
- d. The Volker Rule
- e. The Liquidity Coverage Ratio
- f. PCAOB Audit Standards

g. US and EU Derivative Rules

9. Which of the following actions has your business taken as a result of changes to the financial services markets?
- a. Increased prices for customers and consumers
 - b. Delayed or canceled planned investments
 - c. Decreased the types of services offered to clients and customers
 - d. Made cuts in other areas, including personnel
 - e. Increased the risk company is exposed to
 - f. Substituted or reduced the types of financial services received
 - g. Substituted or reduced financial institutions providing services
 - h. Absorbed the higher costs
10. Do you expect the regulations for the financial services sector to improve or worsen the outlook for your business over the next 2-3 years?
- a. Significantly improve
 - b. Somewhat improve
 - c. Neither/Unsure
 - d. Somewhat worsen
 - e. Significantly worsen

Appendix B: Regulatory Effects on Emerging Financial Systems

About the Survey

Financial Technology (FinTech) is attracting increasing attention from consumers, investors, the investment management industry, and regulators in the United States and across the world. The purpose of this survey is to assess the anticipated effects of financial regulatory impact on emerging financial systems like blockchain and other financial technologies. There are 10 questions that should take only a few minutes to answer.

11. Which one of the following best describes your organization?

- a. Accounting/Audit
- b. Business banking
- c. Capital markets/investment banking
- d. Insurance
- e. Lending/Credit
- f. Payments
- g. Private banking
- h. Private equity/venture capital
- i. Retail banking
- j. Trading/brokerage
- k. Wealth/fund/asset management
- l. Other financial services
- m. Non-financial services

12. Select the financial services that you use financial technologies for:
- a. Cash management
 - b. Obtaining short-term loans
 - c. Obtaining long-term loans
 - d. Issuing long-term debt
 - e. Trade financing
 - f. Purchasing derivatives
 - g. Equity Issuance
 - h. Issuing commercial paper
13. Select the FinTech attributes that are important to your company:
- a. Has a well-established local or regional footprint?
 - b. Has a wide spectrum of services?
 - c. Has a regional presence?
 - d. Has a large domestic footprint?
 - e. Specializes in specific products?
 - f. Has a large global footprint?
14. Over the next 12 months, which of the following issues do you foresee as the biggest financial concerns for FinTech companies/users?
- a. Maintaining cash flow and liquidity
 - b. Managing risks on price fluctuations on exchange rates, interest rates, and commodities
 - c. Dealing with uncertainty over new financial regulations

- d. Restrictions on diversity credit from lenders
 - e. Market liquidity
 - f. Managing risks from international credit markets
15. Over the next 12 months, which of the following issues do you foresee as the biggest operational concerns for FinTech companies?
- a. Accessing Credit
 - b. Managing day-to-day currency risk
 - c. Raising short-term operating capital
 - d. Investing in short-term capital
 - e. Adopting long-term credit raising plans for the business
 - f. Negotiating terms and conditions for loans
 - g. Attracting investors and raising capital and equity from the public and private markets
 - h. Accessing the public debt markets
 - i. Reducing the risks of litigation when releasing company disclosures to analysts
16. Thinking about the past 2-3 years, which of the following specific regulatory changes have caused increased costs or other challenges for FinTech companies/users?
- a. Increased bank capital charges
 - b. Increased regulation of derivatives
 - c. Changes to money market mutual funds
 - d. Inability to hold cash deposits

- e. Restrictions on the ability to engage in physical commodity activities
- f. Other
- g. None

17. In recent years, many new financial rules and regulations have been implemented.

Would you say that the following regulations have had a positive impact on financial technologies?

- a. Basel III
- b. SIFI Regulations
- c. SEC Money Market Fund Reforms
- d. The Volker Rule
- e. The Liquidity Coverage Ratio
- f. PCAOB Audit Standards
- g. US and EU Derivative Rules

18. In recent years, many new financial rules and regulations have been implemented.

Would you say that the following regulations have had a negative impact on financial technologies?

- a. Basle III
- b. SIFI Regulations
- c. SEC Money Market Fund Reforms
- d. The Volker Rule
- e. The Liquidity Coverage Ratio
- f. PCAOB Audit Standards

g. US and EU Derivative Rules

19. Which of the following actions has FinTech companies taken as a result of changes to the financial services markets?

- a. Increased prices for customers and consumers
- b. Delayed or canceled planned investments
- c. Decreased the types of services offered to clients and customers
- d. Made cuts in other areas, including personnel
- e. Increased the risk company is exposed to
- f. Substituted or reduced the types of financial services received
- g. Substituted or reduced financial institutions providing services
- h. Absorbed the higher costs

20. Do you expect the regulations for the financial services sector to improve or worsen the outlook for financial technologies over the next 2-3 years?

- a. Significantly improve
- b. Somewhat improve
- c. Neither/Unsure
- d. Somewhat worsen
- e. Significantly worsen