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**An Examination of Blockchain Technology and Venezuela's Sovereign-
Based Cryptocurrency Including the Effects of Implementing a Sovereign-
Based Cryptocurrency in Developing Countries**

by

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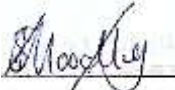
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DECLARATION

I, Jenelle Shenice Moodley, hereby declare that this dissertation, unless specifically indicated otherwise, is my own work and that all references have been properly made. This dissertation has not been submitted to any other university in full or partial requirement of the academic requirements of any other degree or qualification.

Signed at Durban on 30 April 2019

Signature: 

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ABSTRACT

After the 2008 financial crisis and the failure of the banking system there was a need to develop alternate payment systems where there was no intermediary involved. In 2008, Bitcoin was developed by Satoshi Nakamoto, and it did not require an intermediary. The invention of Bitcoin and cryptocurrencies in general, has numerous advantages that can be beneficial to society. Venezuela, a developing country, created their own sovereign cryptocurrency as an attempt to ease the economic strain that burdens the country. The main focus of this research is to examine cryptocurrencies and blockchain technology by looking at Venezuela's Petro as the model to assess whether such a development would be beneficial to a developing country such as South Africa. In addition, any risks that are attached to this invention will be examined.

This research was based on the qualitative approach. Various journal articles, online articles and legislation was consulted to assist with the research of this paper. This research was aimed at assisting the relevant stakeholders of developing countries such as South Africa since such countries are facing economic crises. The Petro which was introduced by Venezuela has been critiqued to have numerous flaws due to the lack of research and investigation by the Venezuelan government. Furthermore, such a development defeats the purpose of a cryptocurrency. The South African Reserve Bank experimented with distributed ledger technology which is based on the blockchain, where interbank transactions were simulated. Although the experiment was successful, the South African Reserve Bank stated that such a system would not be implemented currently as more research needs to be conducted. Considering the various implications, it was concluded that introducing a sovereign cryptocurrency would not be viable and feasible in a country like South Africa.

This research paper recommends that the developing countries consider implementing blockchain technology in various institutions as this technology has many uses and advantages such as assisting with the voting process, as well as minting citizen's information. A further recommendation is for the South African Reserve Bank to research the area of blockchain technology in the banking system as this would decrease interbank transactional costs thereby allowing more transactions to be completed in a shorter amount of time.

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Figure 2.1 Bitcoin's Market Capitalization as of March 27, 2019

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LIST OF ABBREVIATIONS

DISCA:	Declaration and Issuance of the Sovereign Currency Act 2018
DLT :	Distributed Ledger Technology
FICA :	Financial Intelligence Centre Act
ICO :	Initial Coin Offering
P2P :	Peer-to-Peer
PTR :	Petro
PoC :	Proof-of-Concept
RMI :	Republic of the Marshall Islands
SARB :	South African Reserve Bank
U.S. :	United States
USA :	United States of America

CHAPTER 1

INTRODUCTION

1.1 Background and Introduction

The advent of the internet has brought with it numerous developments which have the potential to impact numerous individuals daily. Notably, the internet permits various commercial transactions to be conducted online such as online banking and online shopping (e-commerce). Recently, there has been a development in money and payment systems online which has had a significant impact on governments and regulators worldwide. This development is called cryptocurrency which can be defined as, “A digital representation of value that can be digitally traded and functions as a medium of exchange, a unit of account and/ or a store of value.”¹ This definition emphasises that cryptocurrencies can be used to digitally pay for goods and services as it holds a value. Cryptocurrency, although it has been around for many years, is a relatively new concept which stakeholders around the world are struggling to comprehend. Prior to the invention of Bitcoin there were many forms of digital payment systems (not cryptocurrencies). However, one such digital payment system, namely ‘CyberCash’, introduced its own digital money. CyberCash had its own form of digital cash called Cybercoin. This invention, however, was unsuccessful.² The observation of the success of Bitcoin from 2008 to present day can be stated that Bitcoin was the first successful cryptocurrency.

Cryptocurrencies³ are founded on the revolutionary blockchain technology which enables secure transactions based on trust.⁴ The blockchain is an "open, distributed ledger that records

¹ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 2 Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

² A Narayanan...et al. *Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction*. (2016) xiii.

³ Crypto coins consist of a sequence of numbers that are digitally encrypted. There must be a differentiation between a digital, virtual and cryptocurrency. A digital currency can be explained as follows, it is “the overall superset that includes virtual currency, which in turn includes cryptocurrencies.” It must be noted that a “digital currency covers a larger group that represents monetary assets in a digital form.” A digital currency can be either “regulated or unregulated.” A virtual currency is a “type of digital currency.” Unlike a digital currency which can be either regulated or unregulated, a virtual currency is not regulated. Virtual currency is defined in chapter 2. A cryptocurrency is currency that uses cryptography and operates by using the blockchain.

Information taken from <https://www.investopedia.com/terms/v/virtual-currency.asp>. Date Accessed: 03 May 2019.

For the purpose of this dissertation, ‘cryptocurrency’ will used.

⁴ S Nakamoto ‘Bitcoin: A Peer-to-Peer Electronic Cash System’ (2008) 1. Available at <https://bitcoin.org/bitcoin.pdf>. Date Accessed: 10 March 2018.

transactions between two parties.”⁵ Several enterprises, such as Bitcoin, have profited on this technology by creating cryptocurrencies which rely on blockchain technology. Many countries such as Nigeria have rejected the idea of cryptocurrency. The Nigerian government banned the use of cryptocurrencies in the country due to the risk of criminal activities associated with cryptocurrencies.⁶ The fear of increased criminal activity is a shared concern by many countries. On the other hand, Venezuela, has introduced their own country-specific cryptocurrency, also known as a sovereign cryptocurrency.⁷ Venezuela is a developing country which is facing a severe economic crisis. As a means of resolving the economic crisis, and by relying on blockchain technology, the government has released a government-backed (sovereign-based) cryptocurrency called Petro.⁸ Petro will be backed by the various raw materials that Venezuela possesses such as oil and gas.⁹ With Venezuela being a developing country, there is a dependence on the Petro to relieve the country from the economic crisis being faced by the country as well as relieve the country from the dependence on the United States (U.S) dollar. The Venezuelan government believes that due to the U.S dollar being enforced as the backing currency this has had a negative effect on developing countries.¹⁰ Therefore, the government believes that by creating their own cryptocurrency based on the oil reserves of the country, it will be independent of the US dollar.

There is a lack of South African research and resources relating to cryptocurrency and blockchain technology, however, the South African Reserve Bank (SARB) issued a Position Paper on Virtual Currencies¹¹ which addresses the issue of cryptocurrencies. In terms of South African law there is currently a lack of regulation or legislation that deals with cryptocurrencies, hence, cryptocurrencies remain unregulated in South Africa. The regulation

⁵ M Iansiti and KR Lakhani ‘The Truth about Blockchain’ (2017) *Harvard Business Review* 4. Available at: https://enterpriseproject.com/sites/default/files/the_truth_about_blockchain.pdf.

⁶ Central Bank of Nigeria *Circular to Banks and Other Financial Institutions on Virtual Currency Operations in Nigeria* (2017) <https://www.cbn.gov.ng/> (Date Accessed: 26 March 2018).

⁷ A sovereign cryptocurrency is a currency where the central bank of a country issues the digital form of the fiat currency.

Information taken from <https://www.investopedia.com/terms/v/virtual-currency.asp>. Date Accessed: 03 May 2019.

⁸ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

⁹ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

¹⁰ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 6. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

¹¹ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014). Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

of cryptocurrencies will not be the focus of such research, however, the technology behind cryptocurrencies will be examined. The aim of this research will be to determine whether such technology will be beneficial for South Africa as well as other developing countries.

As economic crises occur internationally and are a global concern impacting on ordinary persons, there is a need to determine whether there is a new and possibly efficient way of improving the economies of these countries. This paper seeks to determine whether developing a sovereign cryptocurrency or blockchain technology is the solution for developing countries' economies such as South Africa's and whether these countries should consider such an option.

1.2 Statement of Purpose

The purpose of this dissertation is to examine the introduction of blockchain technology to the cyber world as well as the benefits it possesses for countries wanting to adopt such technology. This dissertation also analyses Venezuela's sovereign-based cryptocurrency, Petro, and examines whether this could be a possibility for South Africa, as well as other developing countries, to consider. Furthermore, this dissertation analyses the impact cryptocurrencies may have on a developing country and the factors that need to be considered before adopting a sovereign cryptocurrency.

In order to provide recommendations to the relevant stakeholders, various documents were analysed such as the Petro Whitepaper¹² (hereafter referred to as 'Whitepaper: Petro') issued by the Venezuelan government. This research provides stakeholders with an analysis of the impact of adopting a sovereign cryptocurrency as well as the alternatives that is provided by blockchain technology that can be implemented in existing systems.

1.3 Rationale for this Research

In 2017, South Africa was graded by credit rating agencies as "junk."¹³ This has a ripple effect on all aspects of the economy as well as on foreign investment. In 2018, Venezuela launched the Petro. Petro was launched to ease the difficulty experienced by the Venezuelan economy. Considering that both South Africa and Venezuela have both had turbulent political histories it can be a possibility that South Africa can follow Venezuela's model and develop a sovereign cryptocurrency. The political environment influences other spheres of a country.

¹² Venezuelan Financial and Technology Proposal 'Whitepaper: Petro' (2018). Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

¹³ C Honeyborne 'Investing in South Africa: The Road to 2025' (2017) *Without Prejudice* 8.

Furthermore, South Africa has an unemployment rate of 27,1 %¹⁴ whereas Venezuela has a projected unemployment rate of 44,3%.¹⁵ Additionally, the International Monetary Fund projected South Africa's gross domestic profit for 2019 to be 1,2%¹⁶ compared to Venezuela's projected 2019 GDP of -13,9%.¹⁷ Venezuela is currently experiencing hyperinflation.¹⁸ Both South Africa and Venezuela have poor GDPs as well as high unemployment rates. There could be a possibility of introducing cryptocurrency to stimulate growth in the economy. In addition, if the Petro were to be used as a model for South Africa, and if the Petro is based on similar technology as Bitcoin, it could be a means of generating income for the unemployed.¹⁹ Developing a cryptocurrency where the supply of the tokens is limited, could assist in easing the strain experienced by the economy. This can be substantiated by looking Venezuela. The Venezuelan government kept creating more fiat currency when the value of the currency dropped on multiple occasions.²⁰ The creation of more currency aggravated the value of the bolivar which led to hyperinflation.²¹

However, prior to developing a sovereign cryptocurrency, Venezuela's Petro will need to be analysed and critiqued. This determination can impact other developing countries to consider a sovereign cryptocurrency.

Regardless of the success of major cryptocurrencies, this topic is relevantly new in South Africa and the SARB cautions against investment in such a 'commodity' by providing various risks attached with cryptocurrencies.²² In addition, there are various factors that affect South Africa from developing a sovereign cryptocurrency that needs to be considered. However, blockchain technology appears to be a promising technology that can be adopted by various institutions to

¹⁴ <https://ewn.co.za/2019/05/01/is-workers-day-worth-celebrating-with-sa-s-high-unemployment-rate>.

¹⁵ <https://www.ceicdata.com/en/indicator/venezuela/forecast-unemployment-rate>. Date Accessed: 03 May 2019.

¹⁶ <https://ewn.co.za/2019/05/01/is-workers-day-worth-celebrating-with-sa-s-high-unemployment-rate>.

¹⁷ <https://www.forbes.com/sites/kenrapoza/2018/11/26/odds-of-venezuela-getting-its-act-together-in-2019-are-zero/#38582ff233ab>. Date Accessed: 03 May 2019.

¹⁸ P Smith 'Venezuela in Crisis: With its economy in free fall and a government looking more and more like a dictatorship, Venezuela is on the brink of disaster' (2017); 149(13); *New York Times Upfront*; 14. Available at: <http://search.ebscohost.com.ukzn.idm.oclc.org/login.aspx?direct=true&db=f5h&AN=123067627&site=ehost-live>. Date Accessed: 2 March 2019.

¹⁹ Those unemployed could be miners and in light of Bitcoin, those who mine are rewarded with bitcoins.

²⁰ <http://theconversation.com/what-caused-hyperinflation-in-venezuela-a-rare-blend-of-public-ineptitude-and-private-enterprise-102483>. Date Accessed: 4 May 2019.

²¹ <http://theconversation.com/what-caused-hyperinflation-in-venezuela-a-rare-blend-of-public-ineptitude-and-private-enterprise-102483>. Date Accessed: 4 May 2019.

²² South African Reserve Bank 'Position Paper on Virtual Currencies' (2014) 5. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

eliminate various unethical behaviour and potentially corruption. Therefore, this area demands that such research be undertaken.

1.4 Research Objectives

The following research objectives was formulated for this dissertation:

1. To determine the need for the development of blockchain technology and cryptocurrencies;
2. To ascertain the various benefits and risks of cryptocurrencies and blockchain technology that could affect users of cryptocurrency;
3. To establish the need for the development of the Petro and to determine the downfalls of the Petro; and
4. To determine the various countries' position regarding cryptocurrencies and to determine the effect this position can have on the adoption of a sovereign-based cryptocurrency.

1.5 Research Questions

The following research questions was formulated for this dissertation:

1. What was the need for the development of blockchain technology and cryptocurrencies?
2. What are the various benefits and risks of cryptocurrencies and blockchain technology that could possibly affect users of cryptocurrency?
3. Why was the Petro developed and what are the downfalls of the Petro?
4. How does the various countries' position on cryptocurrencies affect the adoption of a sovereign-based cryptocurrency?
 - a. What are the factors in South Africa that may affect the adoption of a sovereign cryptocurrency?

1.6 Methodology

This research comprises of primarily desktop research. The research materials include various textbooks, journal articles, website articles, white papers and online news articles. These sources assisted in answering the various questions pertaining to this research. Documents was

collected through the use of internet and library sources in order to support the research as well as assist in developing in a critical analysis relating to the topic.

1.7 Research Limitations

This research was limited to desktop research. Furthermore, since the topic is relatively new there is a deficit in the research material available. As a result of the lack of material; journal articles, whitepapers, website articles as well as online newspaper articles were used to supplement the research.

Taking into consideration the limitations of the ethical clearance certificate, interviews with human participants could not be conducted. Furthermore, cryptocurrencies are still gaining momentum in South Africa thus there is a lack of experts on the subject that could be approached to supplement the research. Furthermore, considering this was a mini dissertation and the word count is limited, the examination of various elements had to be contained.

1.8 Format of the Dissertation

The dissertation is structured as follows:

- Chapter one: Introduction. This chapter provides a brief overview of the dissertation. The chapter provides the background, the rationale and research questions pertaining to this research paper.
- Chapter two: This chapter looks at the rationale behind introducing cryptocurrencies as well as a discussion on blockchain technology. A brief background of the 2008 financial crisis is provided.
- Chapter three: This chapter looks at the benefits and risks of cryptocurrencies which can influence individuals, governments and financial institutions considering cryptocurrency adoption. This chapter also includes international cases which are used to illustrate the risks associated with cryptocurrencies.
- Chapter four: This chapter reviews Venezuela's sovereign based cryptocurrency. This chapter provides a brief overview of the country's economy and natural resources. In addition, this chapter provides a critique on the Petro.
- Chapter five: This chapter analyses The Marshall Islands, Australia and South Africa's stance regarding cryptocurrencies and seeks to determine whether this will affect the adoption of a sovereign based cryptocurrency. This aspect will be dealt with

by looking at the Position Paper on Virtual Currencies²³ as well as the paper issued by the SARB regarding Project Khokha.²⁴ Thereafter the various factors that pose an issue for South Africa, such as the mining sector and the electricity crisis amongst other factors, are discussed in this chapter.

- Chapter 6: Recommendation and conclusion. This chapter summarises the focal points discussed in this dissertation and, in an attempt to answer the research questions, recommendations are provided.

²³ South African Reserve Bank 'Position Paper on Virtual Currencies' (2014). Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

²⁴ South African Reserve Bank, "Project Khokha—Exploring the use of distributed ledger technology for interbank payments settlement in South Africa." (2018). Available at: https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/8491/SARB_ProjectKhokha%200180605.pdf. Date Accessed: 9 September 2018.

CHAPTER 2

THE DEVELOPMENT OF CRYPTOCURRENCIES AND BLOCKCHAIN TECHNOLOGY

2.1 Introduction

Money, currency and payment systems have evolved tremendously over the past century. Over the last decade the world has been introduced to new monetary system that has the potential to change the way one traditionally transacts. The introduction of cryptocurrency has shifted the world's thinking and caused individuals to reconsider the traditional methods of payment and banking. However, what was the primary purpose behind the invention of cryptocurrencies? This chapter will set the foundation for the rest of this research paper. This chapter will provide a brief background concerning the 2008 financial crisis, thereafter a discussion on Bitcoin and blockchain technology will be provided. The focus of this chapter will be on the introduction of cryptocurrencies and blockchain technology.

2.2 The 2008 Financial Crisis

In 2008, sixty-nine years after the Great Depression,²⁵ the world experienced a financial crisis which had a major effect on various economies around the world. Importantly, the banking industry was one of the most affected institutions. The failure of the banking system in the United States of America ultimately led to the rest of the world experiencing, what can be considered, the second worst financial crisis since the Great Depression in 1930.

The financial crisis (also known as the subprime mortgage crisis)²⁶ began in 2007 when the housing prices in the United States declined.²⁷ The crisis commenced when the American banks were offering mortgages at low rates to those individuals who were not normally eligible for ordinary home loans. These loans were called subprime mortgages.²⁸ Buyers were drawn to taking out loans, however, they eventually could not repay these loans. This predicament

²⁵ The Great Depression occurred in the early 1900's from the year 1929 to 1939. The Great Depression had its origins in the United States of America, however, the effects were global. During this time the world experienced the longest period of unemployment. In addition, business activity was not improving. Furthermore, during this time, the stock markets crashed, and the banks were failing.

Information taken from *Bank. The World Book Encyclopedia* (2010) 340.

²⁶ *Bank. The World Book Encyclopedia* (2010) 95.

²⁷ CD Romer and RH Pells. "Great Depression." (2018) *Encyclopaedia Britannica, Inc.* <https://www.britannica.com/event/Great-Depression> (Date Accessed: 14 June 2018).

²⁸ *Bank. The World Book Encyclopedia* (2010) 95.

resulted in numerous banks losing money and thereafter resulted in the rapid decrease of housing prices.²⁹

Numerous financial institutions had to be rescued and many institutions, which could not be rescued, declared bankruptcy.³⁰ Many people lost money which they had invested in the banks which ultimately, had a significant impact on all sectors of the US economy, which eventually spread to the rest of the world.³¹

By the end of 2008 the recession had affected the rest of the world, more specifically the major economies of the world.³² In Europe, the impact of the financial crisis was so immense that it led to the nationalisation of numerous banks.³³ Apart from the effect that the financial crisis had on the developed countries, it had affected emerging countries as well. The lesser developed countries which had foreign investments were not profitable due to the financial crisis.

Richard Robb's article critically analyses the causes that contributed to the financial crisis.³⁴ The author mentions that a loss of confidence in the financial institutions contributed to the failure of these institutions.³⁵ The author further states by quoting the Financial Crisis Inquiry Commission, "Lack of transparency put the financial system on a collision course with crisis."³⁶ He asserts that the lack of transparency in financial products and the financial markets contributed to the financial crisis.³⁷ Financial institutions and the economy are regularly rated by rating agencies.³⁸ These rating agencies had rated these loans as safe.³⁹ Robb states that the failure of the financial institutions was partly caused by the credit ratings given by the agencies.⁴⁰

²⁹ Bank. *The World Book Encyclopedia* (2010) 95.

³⁰ CD Romer and RH Pells. "Great Depression." (2018) *Encyclopaedia Britannica, Inc.* <https://www.britannica.com/event/Great-Depression> (Date Accessed: 14 June 2018).

³¹ CD Romer and RH Pells. "Great Depression." (2018) *Encyclopaedia Britannica, Inc.* <https://www.britannica.com/event/Great-Depression> (Date Accessed: 14 June 2018).

³² CD Romer and RH Pells. "Great Depression." (2018) *Encyclopaedia Britannica, Inc.* <https://www.britannica.com/event/Great-Depression> (Date Accessed: 14 June 2018).

³³ Bank. *The World Book Encyclopedia* (2010) 95.

³⁴ R Robb 'An Epistemology of the Financial Crisis' (2013) 25(2) *Critical Review* 133.

³⁵ R Robb 'An Epistemology of the Financial Crisis' (2013) 25(2) *Critical Review* 132.

³⁶ R Robb 'An Epistemology of the Financial Crisis' (2013) 25(2) *Critical Review* 138.

³⁷ R Robb 'An Epistemology of the Financial Crisis' (2013) 25(2) *Critical Review* 138.

³⁸ R Robb 'An Epistemology of the Financial Crisis' (2013) 25(2) *Critical Review* 138.

³⁹ CD Romer and RH Pells. "Great Depression." (2018) *Encyclopaedia Britannica, Inc.* <https://www.britannica.com/event/Great-Depression> (Date Accessed: 14 June 2018).

⁴⁰ R Robb 'An Epistemology of the Financial Crisis' (2013) 25(2) *Critical Review* 143.

Both financial crises, namely the Great Depression and the 2008 financial crisis, were caused by the failures of the banks. There are numerous effects that can be attributed to financial crises such as the high rate of unemployment and poverty⁴¹ as businesses were failing during this time and could not retain many employees. When banks collapse, they can lose the money of countless depositors.⁴² As a result of this, there was a need to develop alternate methods of storing money. Therefore, cryptocurrencies were developed. In 2008, Bitcoin was introduced with the sole purpose of resolving the double-spending problem⁴³ and to create a system that is trust-less (a system that does not rely on an intermediary for transactions).⁴⁴ The following part of this chapter will look at the introduction of cryptocurrencies by focusing on Bitcoin.

2.3 The Introduction of Cryptocurrencies

Prior to explaining the introduction of cryptocurrencies, it is necessary to note that the focus of this research will be on cryptocurrencies and not virtual currencies, however, both terms will be defined. Cryptocurrency can be defined as, “a digital asset that forms the basis of peer-to-peer electronic cash systems and uses cryptography as a security measure.”⁴⁵ The SARB defines virtual currency as, “A digital representation of value that can be digitally traded and functions as a medium of exchange, a unit of account and/ or a store of value.”⁴⁶ Simply put, cryptocurrencies are tokens that can be traded.⁴⁷ It can be extracted from the above explanations that cryptocurrency is incorporeal.

One of the most prominent cryptocurrencies globally is Bitcoin. Bitcoin was introduced in 2008 by the pseudonymous Satoshi Nakamoto (and individual or group of people whose location is unknown).⁴⁸ Bitcoin has stirred up both national and international government systems as governments are grappling with this technology. Figure 2.1 illustrates Bitcoin’s market capitalization as well as the number of bitcoins that are circulating currently (note: the supply of bitcoins is capped at 21 million bitcoins). Figure 2.1 indicates that out of 21 million bitcoins,

⁴¹ *Depression. The World Book Encyclopedia* (2010) 150.

⁴² *Depression. The World Book Encyclopedia* (2010) 150.

⁴³ Double spending is when one tries to use the same token for multiple transactions.

⁴⁴ S Nakamoto ‘Bitcoin: A Peer-to-Peer Electronic Cash System’ (2008) 1. Available at <https://bitcoin.org/bitcoin.pdf>. Date Accessed: 10 March 2018.

⁴⁵ U Ramracheya ‘The Dawn of our Tech-Conomy’ (2017) 17(11) *Without Prejudice* 33.

⁴⁶ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 2. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

⁴⁷ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 20.

⁴⁸ S Nakamoto ‘Bitcoin: A Peer-to-Peer Electronic Cash System’ (2008) 1. Available at <https://bitcoin.org/bitcoin.pdf>. Date Accessed: 10 March 2018.

there are 17,6 million bitcoins circulating. It has been argued that “Bitcoin will be the transformation of financial behaviour in developing countries.”⁴⁹

Market Cap	Volume (24h)	Circulating Supply	Max Supply
\$71,685,267,184 USD 17,612,950 BTC	\$10,764,476,618 USD 2,644,442 BTC	17,612,950 BTC	21,000,000 BTC

Figure 2.1⁵⁰ Bitcoin’s Market Capitalization as of March 27, 2019.

Bitcoin was developed as a reaction to the 2008 financial crisis.⁵¹ The core feature of Bitcoin is the lack of an intermediary.⁵² Nakamoto stated, in the whitepaper for Bitcoin (Whitepaper: Bitcoin), regarding the reason for creating a digital currency without a central authority is as follows:

“Commerce on the Internet has come to rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments. While the system works well enough for most transactions, it still suffers from the inherent weakness of the trust based model. Further, the existence of a trusted intermediary increases transaction costs, cutting of the possibility for small casual transactions.”⁵³

Bitcoin is, as well as many altcoins,⁵⁴ a decentralised peer-to-peer network system that relies on the participants within the system. The primary purpose of decentralising the cryptocurrency is to remove the intermediary. The SARB notes that the intermediaries primarily consist of the banking industry (both central and commercial banks) as well as the institutions that are licensed to distribute money.⁵⁵ Weaver states that the main purpose behind the creation of Bitcoin was “to enable a censorship-resistant and irreversible payment system.”⁵⁶

⁴⁹ A Walton and K Johnston ‘Exploring Perceptions of Bitcoin Adoption: The South African Virtual Community Perspective’ (2018) 13 *Interdisciplinary Journal of Information, Knowledge & Management* 166.

⁵⁰ <https://coinmarketcap.com/currencies/bitcoin/historical-data/> (Date Accessed: 27 March 2019).

⁵¹ K Mitchell ‘Bitcoin from The Beginning’ (2014) 14(2) *Without Prejudice* 60.

⁵² N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 21.

⁵³ R Farell; “An analysis of the cryptocurrency industry”; (2015); *Wharton Research Scholars*; 131.

⁵⁴ Altcoins are cryptocurrencies that have been developed after Bitcoin was invented and introduced. The primary purpose behind the creation of altcoins is to improve operation of the system used for Bitcoin.

Information taken from: Y Yuan and FY Wang ‘Blockchain and Cryptocurrencies: Model, Techniques, and Applications’ (2018) 48(9) *IEEE Transactions on Systems, Man, and Cybernetics: Systems* 1423.

⁵⁵ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 3. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

⁵⁶ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 21.

The SARB issued a Position Paper on Virtual Currencies⁵⁷ whereby the key issues surrounding cryptocurrencies were addressed. The position paper⁵⁸ importantly differentiates between centralized virtual currencies and decentralized virtual currencies. Centralised virtual currencies are a “single administrating authority, i.e. a third party that controls the system.”⁵⁹

Decentralised virtual currencies can be defined as, “distributed, open-source, math-based peer-to-peer virtual currencies that have no central administrating authority, and no central monitoring or oversight.”⁶⁰ Some examples of decentralized cryptocurrencies are Bitcoin, Ripple, Litecoin, and Ethereum. The SARBs states that decentralized virtual currencies can be exchanged for legal tender⁶¹ which can be used to buy goods and/or services.

As aforementioned, decentralised cryptocurrencies are independent of any intermediary or central authority regarding the issuing or managing of the cryptocurrency.⁶² Cryptocurrencies, like Bitcoin for example, utilise mathematical algorithms.⁶³ Unlike many other payment mediums, cryptocurrencies “rely on cryptographic proof rather than trust.”⁶⁴

The operation of cryptocurrencies can be simply stated as follows: A participant must initially create a “cryptographic public/private key pair”⁶⁵ The public key is the public address of the participant which enables the participant to send or receive money.⁶⁶ The key feature with the

⁵⁷ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014). Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

⁵⁸ Position papers are published by the South African Reserve Bank in order to state the SARB’s position in respect of specific payment system issues. These documents normally contain approaches, procedures and policy matters, which are applicable at a particular time.

⁵⁹ Financial Action Task Force ‘Virtual Currencies: Key Definitions and Potential AML/CFT Risks’ FATF Report (2014) 5. Available at <http://www.fatf-gafi.org/media/fatf/documents/reports/Virtual-currency-key-definitions-and-potential-aml-cft-risks.pdf>. Date Accessed: 16 March 2018.

⁶⁰ Financial Action Task Force ‘Virtual Currencies: Key Definitions and Potential AML/CFT Risks’ FATF Report (2014) 5. Available at <http://www.fatf-gafi.org/media/fatf/documents/reports/Virtual-currency-key-definitions-and-potential-aml-cft-risks.pdf>. Date Accessed: 16 March 2018.

⁶¹ Legal tender is the currency that is issued by the government or central bank i.e. The South African Rand.

⁶² D Genkin, D Papadopoulos and C Papamanthu ‘Privacy in Decentralized Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 78.

⁶³ D Genkin, D Papadopoulos and C Papamanthu ‘Privacy in Decentralized Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 78.

⁶⁴ R Farell ‘An Analysis of The Cryptocurrency Industry’ (2015) *Wharton Research Scholars* 135.

⁶⁵ D Genkin, D Papadopoulos and C Papamanthu ‘Privacy in Decentralized Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 80.

⁶⁶ D Genkin, D Papadopoulos and C Papamanthu ‘Privacy in Decentralized Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 80.

public and private keys is the ability of the participant to create numerous key pairs such as a pair for every transaction involved.⁶⁷

Another key aspect of cryptocurrencies is the presence of miners. The function of miners is closely related to the blockchain, which will be discussed in detail below. The function of miners can be described as follows: "...collect transactions and store them into blocks. These blocks are subsequently stored in a global public ledger of transactions known as the blockchain."⁶⁸ Miners verify the transactions on the network and if valid, the miner will add the block to the blockchain.⁶⁹ Miners, who are able to validate the block (or transaction), are rewarded with cryptocurrency.⁷⁰

Bitcoin utilises a technology called 'blockchain technology.' Bitcoin uses a blockchain that is decentralised and in addition, it is independent of banks and governments.⁷¹ Bitcoin was one of the first cryptocurrency networks that implemented blockchain into its system.⁷² It is important to note that the blockchain is not the currency.⁷³ The blockchain merely provides a platform whereby the bitcoins can be used as a currency.⁷⁴ Blockchain technology will be discussed in detail below.

2.3.1 Blockchain Technology

Blockchain was colloquially described as follows: "If cryptocurrencies are train cars, the blockchain technology is the rails on which they run."⁷⁵ Blockchain is an "open, distributed ledger that records transactions between two parties."⁷⁶ The blockchain is a distributed ledger which means that all the information that occurs on the network will be made available to the

⁶⁷ D Genkin, D Papadopoulos and C Papamanthu 'Privacy in Decentralized Cryptocurrencies' (2018) 61(6) *Communications of the ACM* 80.

⁶⁸ D Genkin, D Papadopoulos and C Papamanthu 'Privacy in Decentralized Cryptocurrencies' (2018) 61(6) *Communications of the ACM* 80.

⁶⁹ AT Limòn 'The Wild, Wild West: Understanding Cryptocurrencies and their Implications on Financial Planning' (2018) *Journal of Financial Planning* 41.

⁷⁰ M Fyrigou-Koulouri 'Blockchain Technology: An Interconnected Legal Framework for An Interconnected System' (2018) 9 *Journal of Law, Technology & the Internet*; 4.

⁷¹ A Wright and P De Filippi; "Decentralized Blockchain Technology and the Rise of Lex Cryptography"; (2015); 9. Available at <http://ssrn.com/abstract=2580664>.

⁷² M Iansiti and KR Lakhani 'The Truth about Blockchain' (2017) *Harvard Business Review* 5. Available at: https://enterpriseproject.com/sites/default/files/the_truth_about_blockchain.pdf.

⁷³ P du Plessis 'The Nature of Decentralized Virtual Currencies' Benefits, Risks and Regulations' *World Trade Institute* (2014) 18.

⁷⁴ P du Plessis 'The Nature of Decentralized Virtual Currencies' Benefits, Risks and Regulations' *World Trade Institute* (2014) 18.

⁷⁵ AT Limòn, "The Wild, Wild West: Understanding Cryptocurrencies and their Implications on Financial Planning" (2018) *Journal of Financial Planning* 41.

⁷⁶ M Iansiti and KR Lakhani; "The Truth About Blockchain"; (2017); *Harvard Business Review*; 4.

participants of that network.⁷⁷ To explain blockchain in simple terms it is a “chronological database of transactions recorded by a network of computers.”⁷⁸ Blockchain implements and uses mathematical algorithms which ensures that there is transparency between the network of computers that verify the transactions.⁷⁹

Simply put, the blockchain is a ledger that is verified by the computers on the specific network.⁸⁰ Since these computers constantly verify the transactions occurring on the network, there is no need for an intermediary.⁸¹

As previously stated, the blockchain is made up of blocks. These blocks contain information of the transactions as well as the answer to the algorithm amongst other information.⁸² As each transaction is verified, the block will get added to the blockchain. The records stored on the blockchain are permanent⁸³ thus making it difficult for any sort of tampering with the records. Blockchain allows for these transactions to be secure thus basing such transactions on trust.⁸⁴ Another benefit provided by blockchain is the increase in certainty of the transaction.⁸⁵ The certainty is further demonstrated as every transaction occurring on the network contains a “timestamp and a unique cryptographic signature...”⁸⁶

The blockchain “can record transaction between two parties in an efficient, verifiable and permanent way...”⁸⁷ In terms of blockchain technology, once the transaction is verified by the

⁷⁷ Blockchain 101 for Governments’ (2017) WU Global Tax Policy Center 3. Available at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

⁷⁸ A Wright and P De Filippi; “Decentralized Blockchain Technology and the Rise of Lex Cryptography”; (2015); 6. Available at <http://ssrn.com/abstract=2580664>.

⁷⁹ A Wright and P De Filippi; “Decentralized Blockchain Technology and the Rise of Lex Cryptography”; (2015); 6. Available at <http://ssrn.com/abstract=2580664>.

⁸⁰ M Koevoets ‘Monetary Policy Implications for the Trade-Off Between a Private Digital Currency and a Central Bank Issued Digital Currency’ (2017) 9.

⁸¹ M Koevoets ‘Monetary Policy Implications for the Trade-Off Between a Private Digital Currency and a Central Bank Issued Digital Currency’ (2017) 9.

⁸² M Fyrigou-Koulouri ‘Blockchain Technology: An Interconnected Legal Framework for An Interconnected System’ (2018) 9 *Journal of Law, Technology & the Internet*; 3.

⁸³ M Iansiti and KR Lakhani ‘The Truth about Blockchain’ (2017) *Harvard Business Review* 4. Available at: https://enterpriseproject.com/sites/default/files/the_truth_about_blockchain.pdf.

⁸⁴ S Nakamoto ‘Bitcoin: A Peer-to-Peer Electronic Cash System’ (2008) 1. Available at <https://bitcoin.org/bitcoin.pdf>. Date Accessed: 10 March 2018.

⁸⁵ M Fyrigou-Koulouri ‘Blockchain Technology: An Interconnected Legal Framework for An Interconnected System’ (2018) 9 *Journal of Law, Technology & the Internet*; 5.

⁸⁶ Blockchain 101 for Governments’ (2017) WU Global Tax Policy Center 3. Available at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

⁸⁷ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 7. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

nodes,⁸⁸ the block or transaction is added to the chain of other verified transactions, thus becoming part of the blockchain. Once transactions are verified and added to the blockchain, it is permanent. The advantage of such a system decreases the possibility of the system being hacked.

The 2008 financial crisis saw a failure in the trusted third parties, hence blockchain sought to remedy this issue. The blockchain is public therefore there is no need to trust an intermediary.⁸⁹ In an ideal world the removal of an intermediary would be advantageous, however, many large institutions contest this idea as the blockchain could replace these institutions who serve as intermediaries for various transactions.⁹⁰

The obstacle presented by blockchain technology that was identified in the article “*Is blockchain hype, revolutionary, or both? What we need to know*”⁹¹ impacts the installation of blockchain technology in weaker governments. The authors stated that if the technology proves to be too complex and complicated for these governments they may resort to the older technologies instead.⁹² Another difficulty found with the blockchain is the problem of anonymity which provides a hinderance to obtaining the details of the account holder.⁹³ The information pertaining to transactions becomes public knowledge which allows any third party, more specifically an attacker to the network, to monitor the transactions and the amount of money involved in these transactions.⁹⁴

Blockchain technology is not limited to cryptocurrency networks. Blockchain technology has the ability of being applied in an array of industries. It has been found that blockchain has the ability to remedy various business concerns, namely:

⁸⁸ A ‘node’ is created when a miner downloads the programme such as Bitcoin. When the programme is downloaded, the computer then becomes a node. Nodes contribute their computational resource to solve a mathematical algorithm. These nodes will monitor the network in order to collect the transactions and store them in a ‘memory pool.’ Nodes will only accept transactions if they are new transactions and if they are valid.

Information taken from: Y Yuan and FY Wang ‘Blockchain and Cryptocurrencies: Model, Techniques, and Applications’ (2018) 48(9) *IEEE Transactions on Systems, Man, and Cybernetics: Systems* 1422-1423.

⁸⁹ M Koevoets ‘Monetary Policy Implications for the Trade-Off Between a Private Digital Currency and a Central Bank Issued Digital Currency’ (2017) 9.

⁹⁰ M Koevoets ‘Monetary Policy Implications for the Trade-Off Between a Private Digital Currency and a Central Bank Issued Digital Currency’ (2017) 9.

⁹¹ S Oh and S Wallsten ‘Is Blockchain Hype, Revolutionary, Or Both? What We Need to Know’ (2018) *A Research Agenda for New Institutional Economics*; 7.

⁹² S Oh and S Wallsten ‘Is Blockchain Hype, Revolutionary, Or Both? What We Need to Know’ (2018) *A Research Agenda for New Institutional Economics*; 7.

⁹³ D Genkin, D Papadopoulos and C Papamanthu ‘Privacy in Decentralized Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 78.

⁹⁴ D Genkin, D Papadopoulos and C Papamanthu ‘Privacy in Decentralized Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 78.

- “Trust;
- Transparency; and
- Accountability”⁹⁵

Blockchain can assist any private or public organisation with regards to electronic voting.⁹⁶ By introducing electronic voting through the blockchain, this could enable a system that is more participatory and secure.⁹⁷

Thirdly, the blockchain could be useful with regard to public administration.⁹⁸ Governments could implement blockchain to provide a more efficient system for identifying persons (citizens), it can be implemented as a mechanism to collect tax from tax payers and it can be used for land registry amongst other uses. It has been noted that by implementing blockchain in government systems, it can facilitate transactions or capturing of data efferently and effectively.⁹⁹

2.3.2 Initiating a Transaction with Bitcoin

Bitcoin is based on blockchain technology, and as mentioned the blockchain is not a currency. A transaction is made on the Bitcoin network which uses Blockchain technology. Transactions occurring on the Bitcoin network is as follows:

If there are two parties, namely A and B, transacting with each other, they will pay using a bitcoin.¹⁰⁰ If A wants to pay B with a bitcoin, A will need to digitally sign “a hash of the previous transaction and the bitcoin address”¹⁰¹ of B. A hash is simply a mathematical equation which consists of various numbers.¹⁰² The digital signature and

⁹⁵ Blockchain 101 for Governments’ (2017) WU Global Tax Policy Center 4.Aavailable at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

⁹⁶ Blockchain 101 for Governments’ (2017) WU Global Tax Policy Center 6.Aavailable at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

⁹⁷ Blockchain 101 for Governments’ (2017) WU Global Tax Policy Center 6.Aavailable at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

⁹⁸ Blockchain 101 for Governments’ (2017) WU Global Tax Policy Center 7.Aavailable at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

⁹⁹ Blockchain 101 for Governments’ (2017) WU Global Tax Policy Center 7. Aavailable at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

¹⁰⁰ Bitcoin (capital B) is the system and bitcoin (lowercase b) is the currency.

¹⁰¹ P du Plessis ‘The Nature of Decentralized Virtual Currencies’ Benefits, Risks and Regulations’ *World Trade Institute* (2014) 18.

¹⁰² J Hofman...et al. *Cyberlaw: A Guide for South Africans doing Business online*. (1999) 67.

bitcoin address will be inserted at the end of the bitcoin.¹⁰³ The miners on the network then confirm transactions and put these transactions into blocks and then start to mine the block (known as mining)¹⁰⁴ The block, once mined, gets added to the blockchain.

This scenario indicates how a bitcoin is transferred. Bitcoin is believed to be money that can be used on the internet.¹⁰⁵ A bitcoin can be used to pay for goods and services provided that merchants accept bitcoins as payment. Furthermore, the cryptocurrency network and the blockchain are interrelated. A transaction occurs and is stored on the blockchain; however, it is not the medium of payment.

2.4 Differences Between Traditional Payment Systems and Cryptocurrencies

To ascertain the importance of cryptocurrencies and what they aim to achieve, it is essential to look at the differences between cryptocurrencies and traditional payment systems.

As mentioned previously, traditional payment systems rely greatly on banks and third parties to process transactions (even those occurring on the internet). Upon examination of these payment systems, the transactions between the parties occur in the following manner: A-intermediary-B. This can be explained as follows:

A enters into a transaction with B whereby A needs to send funds to B. A requests C, who is the bank, to transfer funds from A's account to B's account. C becomes the intermediary, or middleman, between the two parties.

Bitcoin, however, invented a peer-to-peer system (P2P). The Whitepaper: Bitcoin states that a P2P system allows the parties to a transaction to send funds directly to each other, "without going through a financial institution."¹⁰⁶ In simple terms, unlike the traditional payment systems as illustrated in the example, a P2P system eliminates the middleman. Hence a transaction would occur between parties A and B, without the need of C (intermediary).

¹⁰³ P du Plessis 'The Nature of Decentralized Virtual Currencies' Benefits, Risks and Regulations' *World Trade Institute* (2014) 18.

¹⁰⁴ NP Dlamini, MS Scott, KK Nair 'A Bitcoin Framework: An Alternative Payment System for Rural Areas of South Africa Using Low-End Mobile Phones' (2016) *SATNAC*.

¹⁰⁵ A Nieman 'A Few South African Cents' Worth on Bitcoin' (2015) 15(5) *Potchefstroom Electronic Law Journal* 1986.

¹⁰⁶ S Nakamoto 'Bitcoin: A Peer-to-Peer Electronic Cash System' (2008) 1. Available at Available at <https://bitcoin.org/bitcoin.pdf>. Date Accessed: 10 March 2018.

Individuals place a great deal of trust in the banking industry, and as shown, with the financial disasters, their trust can be argued to be misplaced. Traditional payment systems such as the 'M-Payment' system rely on trust to effect transactions and it is noted to be a challenge.¹⁰⁷ Trust plays a vital role in online transactions as parties are essentially concerned whether their information remains confidential and whether their information is susceptible to hacking.¹⁰⁸ Transactions occurring on the internet are highly susceptible to cybercrimes to which many systems do not address.

After the 2008 financial crisis, Bitcoin was developed to provide an alternative payment system that uses cryptography and the infamous 'Proof-of-Work' to verify transactions.¹⁰⁹ Bitcoin uses blockchain technology which incorporates mathematical algorithms to ensure the validity of transactions and to ensure that the transactions are secure.¹¹⁰ When transactions are verified and recorded on the blockchain, it becomes permanent and it is not susceptible to interference. The blockchain is a secure mode of storing transactions and data. Furthermore, when parties are transacting on Bitcoin, their identities are anonymous. What is key to note is, the transactions are not anonymous but rather public, however, the parties to the transactions are anonymous.

2.5 Conclusion

Various key events of the past century have played a significant role in leading up to the development of Bitcoin. As noted above, Bitcoin was created as a reaction to the 2008 financial crisis after observing the global effects of the downfall of a trusted intermediary. Certain countries are still recovering from the 2008 financial crisis whilst others are unable to escape the effects of the 2008 crisis. In consideration of this, it is therefore essential to examine the risks of cryptocurrencies prior to examining Venezuela's Petro and the impact of creating a cryptocurrency for South Africa. The following chapter discusses the various risks attached to

¹⁰⁷ N Dlodlo 'The Use of M-Payment Services in South Africa: A Value Based Perceptions Approach' (2015) 14(1) *International Business & Economics Research Journal (Online)* 163.

¹⁰⁸ N Dlodlo 'The Use of M-Payment Services in South Africa: A Value Based Perceptions Approach' (2015) 14(1) *International Business & Economics Research Journal (Online)*; 165.

¹⁰⁹ 'Proof-of-Work' is an algorithm found on the blockchain which is used to confirm and verify transactions. The Proof-of-Work also enables the new creation of blocks on the blockchain. Information taken from <https://cointelegraph.com/explained/proof-of-work-explained>. Date Accessed: 4 May 2019.

¹¹⁰ A Wright and P De Filippi; "Decentralized Blockchain Technology and the Rise of Lex Cryptography"; (2015); 6. Available at <http://ssrn.com/abstract=2580664>.

cryptocurrencies. These risks play an essential role in this research paper as it will affect the outcome of whether a developing country should adopt a sovereign cryptocurrency.

CHAPTER 3

BENEFITS AND RISKS ASSOCIATED WITH CRYPTOCURRENCY

3.1 Introduction

Prior to assessing whether implementing a sovereign cryptocurrency in developing countries would be a viable option, it is necessary to analyse the benefits and risks of cryptocurrencies. Whilst there are benefits of cryptocurrencies (which was briefly explained in chapter 2 and will be briefly analysed in this chapter), the focus of this chapter will be on the risks that cryptocurrencies pose for individuals, government organisations, financial institutions and regulatory authorities.

A unique characteristic attached to cryptocurrencies is the characteristic of anonymous transactions, or anonymity. There are both advantages and disadvantages attached to anonymity, but research has shown an array of disadvantages. The characteristic of anonymity has been present and has facilitated numerous illicit activities which can be detrimental to the functioning and existence of such cryptocurrencies. Bill Gates believes anonymity is detrimental as this prevents the government from investigating cases of money laundering, tax evasion as well as terrorist funding.¹¹¹ This chapter seeks to discuss the benefits and risks that are associated with cryptocurrencies as well as looking at the case of Silk Road to illustrate how anonymity facilitates illicit activities. This chapter seeks to analyse the various risks of cryptocurrencies, which is necessary before contemplating to need to develop a sovereign cryptocurrency.

3.2 Benefits of Cryptocurrencies

Whilst chapter 3 will deal primarily with the risks associated with cryptocurrencies, this section however, will briefly analyse the advantages that cryptocurrencies offer.

The first advantage that cryptocurrencies offer relates to the simplicity of transactions. As mentioned in chapter 2, cryptocurrency transactions eliminate third parties from the transactions.¹¹² When the third party is eliminated, the cost of the transaction reduces thus making cryptocurrency transactions cheaper.¹¹³ This can be contrasted to the traditional

¹¹¹ B Peterson 'Bill Gates Says Cryptocurrency Is 'A Rare Technology That Has Caused Deaths In A Fairly Direct Way' *Business Insider South Africa* Available at: <https://www.businessinsider.co.za/bill-gates-on-cryptocurrency-2018-2?r=US&IR=T>. Date Accessed: 29 March 2018.

¹¹² <https://blog.finjan.com/advantages-of-cryptocurrency/> Date Accessed: 4 May 2019.

¹¹³ <https://blog.finjan.com/advantages-of-cryptocurrency/> Date Accessed: 4 May 2019.

methods of payment whereby these institutions, such as the banking industry, charge transaction and service fees which are estimated to be between 2-5%.¹¹⁴ These fees usually have a negative effect on smaller business by affecting their profits.¹¹⁵

Furthermore, cryptocurrency transactions are more efficient and are faster.¹¹⁶ This is beneficial to businesses, especially with international payments.¹¹⁷ Additionally, cryptocurrencies are not regulated in terms of exchange rates that are enforced by any specific country thus making cross border transactions simple.¹¹⁸

Another benefit that is offered by cryptocurrencies is the greater access to credit.¹¹⁹ Cryptocurrencies are beneficial to those who have access to internet, and it is estimated that there are about 2,2 billion individuals globally who have access to the internet, however, a large number of the global population do not have access to the traditional payment systems.¹²⁰

Another advantage of cryptocurrencies which is beneficial to governments is the element of cryptography and Proof-of-Work (as used by Bitcoin).¹²¹ This prevents the counterfeiting of cryptocurrency.¹²²

These benefits have the potential of impacting the manner in which various governments and financial organisations perceive cryptocurrencies, especially for the smaller business. Furthermore, these benefits can potentially impact a country that is contemplating developing a sovereign cryptocurrency.

3.3 Categories of Risks

¹¹⁴ T Alcorn...et al 'Legitimizing Bitcoin: Policy Recommendations' (2013) 8. Available at: <http://groups.csail.mit.edu/mac/classes/6.805/student-papers/fall13-papers/bitcoin.pdf>.

¹¹⁵ T Alcorn...et al 'Legitimizing Bitcoin: Policy Recommendations' (2013) 8. Available at: <http://groups.csail.mit.edu/mac/classes/6.805/student-papers/fall13-papers/bitcoin.pdf>.

¹¹⁶ O Nica, K Piotrowska and KR Schenk-Hoppe 'Cryptocurrencies: Economic Benefits and Risks' (2017) *University of Manchester, FinTech Working Paper 2 3*.

¹¹⁷ O Nica, K Piotrowska and KR Schenk-Hoppe 'Cryptocurrencies: Economic Benefits and Risks' (2017) *University of Manchester, FinTech Working Paper 2 3*.

¹¹⁸ <https://blog.finjan.com/advantages-of-cryptocurrency/> Date Accessed: 4 May 2019.

¹¹⁹ <https://blog.finjan.com/advantages-of-cryptocurrency/> Date Accessed: 4 May 2019.

¹²⁰ <https://blog.finjan.com/advantages-of-cryptocurrency/> Date Accessed: 4 May 2019.

¹²¹ T Alcorn...et al 'Legitimizing Bitcoin: Policy Recommendations' (2013) 9. Available at: <http://groups.csail.mit.edu/mac/classes/6.805/student-papers/fall13-papers/bitcoin.pdf>.

¹²² T Alcorn...et al 'Legitimizing Bitcoin: Policy Recommendations' (2013) 9. Available at: <http://groups.csail.mit.edu/mac/classes/6.805/student-papers/fall13-papers/bitcoin.pdf>.

Nicholas Weaver states that cryptocurrencies “do not work as currencies, they are grossly inefficient...”¹²³ According to Weaver, he identifies four risks that affect individuals, namely: technical risks, economic risks, systemic risks and societal risks.¹²⁴

Regarding technical risks, the private key can be affected. Once this key is compromised by a third party the owner of the key can lose their cryptocurrency.¹²⁵ Economic risks relate to the price instability that is associated with cryptocurrencies.¹²⁶ Cryptocurrencies, as will be seen later on in this chapter, are unstable with regard to their value. The value of cryptocurrencies changes daily. Furthermore, the value of cryptocurrencies essentially depends on what an individual is willing to pay for a token.¹²⁷ Another risk, that is economic in nature, that any individual is susceptible to is the increase in cryptocurrency scams whereby organisations sell themselves as legitimate cryptocurrency networks to unsuspecting individuals in order to gain their money.¹²⁸

The third risk that must be addressed is systemic risks. This can be explained as follows: If a P2P system is coded in a language that makes the system weak, the system then becomes susceptible to computer viruses or bugs.¹²⁹ These viruses allow the ‘attacker’ to enter the cryptocurrency network (e.g. Bitcoin) which can lead to theft of the cryptocurrencies.¹³⁰

The fourth risk is the risk that cryptocurrencies pose to society. As mentioned previously, cryptocurrency networks thrive on anonymity which is beneficial to criminals.¹³¹ Anonymous transactions, although not unlawful, enable money laundering amongst other criminal activities and the forecast is that as a result of this feature online crime is likely to increase.¹³² Further disadvantages of engaging on the trading in cyber currencies will be discussed below.

3.4 Money Laundering

Money laundering has been identified as one of the principal concerns surrounding cryptocurrencies. Danton Bryans explains money laundering as follows, “Money laundering is

¹²³ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 20.

¹²⁴ N Weaver, “Risks of Cryptocurrencies” (2018) 61(6) *Communications of the ACM* 20.

¹²⁵ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 22.

¹²⁶ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 23.

¹²⁷ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 23.

¹²⁸ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 23.

¹²⁹ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 23.

¹³⁰ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 23.

¹³¹ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 24.

¹³² N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 23.

the process of making illegally-gained proceeds (i.e. ‘dirty money’) appear legal (i.e. ‘clean’).”¹³³

Regarding traditional money laundering, it has been found that there are three stages to achieving this crime, namely:

1. Placement- This is a means of depositing the money into the financial system¹³⁴;
2. Layering- Those individuals involved transfer and convert money to break the link between the money and the illegal source¹³⁵; and
3. Integration- The illegal money is then legally re-deposited into the financial system to make the money appear legitimate.¹³⁶

The stages provided above are associated with traditional money and money laundering activities. Regarding cryptocurrencies and their virtual state, the process would differ slightly. The key difference is the presence of the anonymous feature.¹³⁷ The anonymity referred to indicates the idea where the transaction is not anonymous, however, the identity of the individual involved in the transaction is anonymous (unknown).¹³⁸

By including anonymity,¹³⁹ it makes it difficult for the enforcement agencies to locate and track the individuals of such crime.¹⁴⁰

The SARB identified numerous risks associated with the use of cryptocurrencies and cited money laundering as one of those risks. SARB stated that the anonymity of transactions that occur using decentralized virtual currencies allows users to avoid the anti-money laundering

¹³³ D Bryans ‘Bitcoin and Money Laundering: Mining for an Effective Solution’ (2014) 89 *Indiana Law Journal* 442.

¹³⁴ D Bryans ‘Bitcoin and Money Laundering: Mining for an Effective Solution’ (2014) 89 *Indiana Law Journal* 442.

¹³⁵ D Bryans ‘Bitcoin and Money Laundering: Mining for an Effective Solution’ (2014) 89 *Indiana Law Journal* 442.

¹³⁶ D Bryans ‘Bitcoin and Money Laundering: Mining for an Effective Solution’ (2014) 89 *Indiana Law Journal* 442.

¹³⁷ D Bryans ‘Bitcoin and Money Laundering: Mining for an Effective Solution’ (2014) 89 *Indiana Law Journal* 447.

¹³⁸ Concept of anonymity / anonymous transactions is briefly discussed in chapter 2.

¹³⁹ Bitcoin is often described as anonymous because it’s possible to send and receive bitcoins without giving any personally identifying information. However, achieving reasonable anonymity with Bitcoin can be quite complicated and perfect anonymity may be impossible. Bitcoin is Pseudonymous. Sending and receiving bitcoins is like writing under a pseudonym. If an author’s pseudonym is ever linked to their identity, everything they ever wrote under that pseudonym will now be linked to them. In Bitcoin, your pseudonym is the address to which you receive Bitcoin. Every transaction involving that address is stored forever in the blockchain. If your address is ever linked to your identity, every transaction will be linked to you.

¹⁴⁰ D Bryans ‘Bitcoin and Money Laundering: Mining for an Effective Solution’ (2014) 89 *Indiana Law Journal* 447.

systems that are in place.¹⁴¹ Money laundering is possible with virtual currencies as transactions are “anonymous, faster and irreversible.”¹⁴² Various cryptocurrency networks offer faster transaction confirmation times in addition to anonymous transactions; however, these characteristics add to the detriment of such invention. Cryptocurrencies eliminates the paper trail that would be present with traditional money and money laundering activities.¹⁴³

Furthermore, those engaged in terrorist activities are attracted to such medium. These individuals can send money across to various countries quickly and secretly whilst incurring low transaction costs.¹⁴⁴ The characteristic of anonymity allows such individuals to ‘cover up their tracks’¹⁴⁵ and as stated previously, it removes the paper trail.

With reference to South African legislation, section 28 of the Financial Intelligence Centre Act 38 of 2001(FICA)¹⁴⁶ addresses cash transactions. In terms of this section, if the value of a transaction exceeds the prescribed limit then it must be reported to the Financial Intelligence Centre.¹⁴⁷ This serves as a protective measure to ensure that funds are legal and that transactions are legal. In contrast to this, cryptocurrencies and cryptocurrency networks have no such provision. This enables the virtual money to move freely between users irrespective of the amount that is being transferred.

In addition to the above, section 29¹⁴⁸ makes provision for a business to report suspicious and unusual transactions. Sections 29(1)(a)-(c) gives the scenarios when these transactions must be reported. This provision, like section 28, aids in combating money laundering and finding out unusual transactions before they can be transferred. Cryptocurrencies however, as they are

¹⁴¹ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 8. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

¹⁴² South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 8. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

¹⁴³ D Bryans ‘Bitcoin and Money Laundering: Mining for an Effective Solution’ (2014) 89 *Indiana Law Journal* 447.

¹⁴⁴ T Mandjee ‘Bitcoin, its Legal Classification and its Regulatory Framework’ (2015) 15(2) *Journal of Business and Securities Law* 185.

¹⁴⁵ T Mandjee ‘Bitcoin, its Legal Classification and its Regulatory Framework’ (2015) 15(2) *Journal of Business and Securities Law* 185.

¹⁴⁶ Financial Intelligence Centre Act 38 of 2001.

¹⁴⁷ “The Financial Intelligence Centre (FIC) is South Africa’s national centre for the receipt of financial data, analysis and dissemination of financial intelligence to the competent authorities. The FIC was established by the Financial Intelligence Centre Act, 2001 (Act 38 of 2001) and has the mandate to identify the proceeds of crime, combat money laundering and terror financing.” Taken from <https://www.fic.gov.za/aboutus/Pages/WhoWeAre.aspx>. Date Accessed: 03 May 2019.

¹⁴⁸ Financial Intelligence Centre Act 38 of 2001.

decentralised and independent of intermediaries, makes no provisions for such an action. Transactions are verified and occur despite the amount that is being transferred which enables the activity of money laundering. As stated in chapter 2, nodes on each network merely verifies a transaction to ensure that the transactions are new and valid,¹⁴⁹ however, the nodes do not analyse the purpose of such transaction.

Another facility that enables illicit activities such as money laundering is the Dark Web. The Dark Web is an “online marketplaces which are not accessible through the traditional search engines such as Google, and therefore operate in the space called the Deep Web.”¹⁵⁰ The Dark Web facilitates anonymous transactions¹⁵¹ without the individual or entity being traced as the Dark Web is reliant on “limited-access networks which require the use of specific software...”¹⁵²

3.5 Instability of Prices of Cryptocurrencies

The instability, or the price volatility, of cryptocurrencies is problematic. The price of cryptocurrencies fluctuates daily.¹⁵³ Cryptocurrencies have been susceptible to immense surges and declines on the cryptocurrency market regarding their price and exchange rates.

The price instability of cryptocurrencies is affected by numerous factors such as “the lack of widespread adoption by consumers, the lack of acceptance by merchants and the reliance on speculation.”¹⁵⁴ Consumer demand affects the price as well. Currently, consumer demand is volatile¹⁵⁵ which affects the price of various cryptocurrencies. The result is that individuals are at risk of losing a considerable sum of money.

¹⁴⁹ Y Yuan and FY Wang ‘Blockchain and Cryptocurrencies: Model, Techniques, and Applications’ (2018) 48(9) *IEEE Transactions on Systems, Man, and Cybernetics: Systems* 1422-1423.

¹⁵⁰ O Nica, K Piotrowska and KR Schenk-Hoppe ‘Cryptocurrencies: Economic Benefits and Risks’ (2017) *University of Manchester, FinTech Working Paper 2* 27.

¹⁵¹ O Nica, K Piotrowska and KR Schenk-Hoppe ‘Cryptocurrencies: Economic Benefits and Risks’ (2017) *University of Manchester, FinTech Working Paper 2* 27.

¹⁵² O Nica, K Piotrowska and KR Schenk-Hoppe ‘Cryptocurrencies: Economic Benefits and Risks’ (2017) *University of Manchester, FinTech Working Paper 2* 27.

¹⁵³ United Nations ESCAP ‘Digital and Virtual Currencies for Sustainable Development’ (2017) 5. Available at <https://www.unescap.org/resources/digital-and-virtual-currencies-sustainable-development>. Date Accessed: 12 June 2018.

¹⁵⁴ JB Turpin ‘Bitcoin: The Economic Case for a Global, Virtual Currency Operating in an Unexplored Legal Framework’ (2014) 21(1) *Indiana Journal of Global Legal Studies* 344.

¹⁵⁵ C Harwick ‘Cryptocurrency and the Problem of Intermediation’ (2016) 20(4) *The Independent Review* 575.

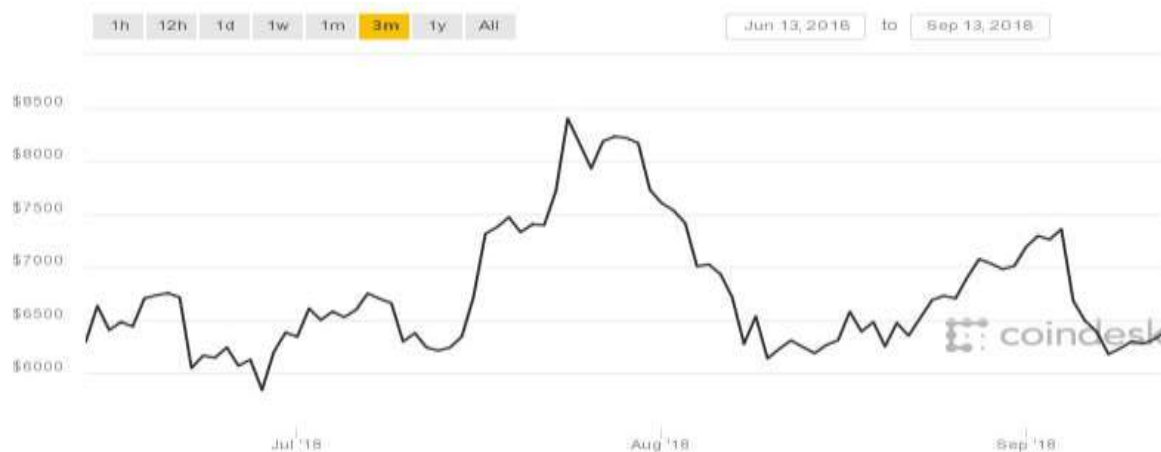


Figure 3.1¹⁵⁶ Price Index of Bitcoin Over A Three-Month Period

Figure 3.1 displays the price index of Bitcoin over a three-month period starting from July 2018 and ending in September 2018 (amounts reflected in US Dollars).

Figure 3.1 illustrates the highs and lows of Bitcoin, from 13 July 2018 to 13 September 2018. In July 2018 Bitcoin peaked and reached an amount close to \$8 500. This success was brief as in August 2018 it decreased to an amount close to \$7 500. The evident decrease can be seen between July and August where Bitcoin decreased from just under \$8 500 to an amount just over \$6 000.

Figure 3.1 indicate and affirms that cryptocurrencies are highly volatile which can be considered as a crucial factor to the adoption of cryptocurrencies.

3.6 Theft and Fraud

Cryptocurrency is highly susceptible to theft and/or fraud. Theft is possible when an individual can hack into a person's computer and steal their 'wallet'.¹⁵⁷ Once the coins from a wallet are lost, stolen or hacked, one cannot recover those coins.¹⁵⁸ When an individual's computer is affected by a virus or is hacked into which results in the theft or loss of coins or wallet, the affected individual has no right of recourse, this is a result of a lack of central authority.¹⁵⁹ Mt

¹⁵⁶ <https://www.coindesk.com/price/> (Date Accessed: 13 September 2018).

¹⁵⁷ JB Turpin 'Bitcoin: The Economic Case for a Global, Virtual Currency Operating in an Unexplored Legal Framework' (2014) 21(1) *Indiana Journal of Global Legal Studies* 345.

¹⁵⁸ A Heid 'Analysis of the Cryptocurrency Marketplace' (2013) Available at: <http://www.hackmiami.org/whitepapers/>. Date Accessed: 12 March 2018.

¹⁵⁹ P du Plessis 'The Nature of Decentralized Virtual Currencies' Benefits, Risks and Regulations' *World Trade Institute* (2014) 31.

Gox, a Japanese-based cryptocurrency market, lost about 850 000 bitcoins due to hacking¹⁶⁰ and this further substantiates that cryptocurrencies are highly vulnerable.

If a user has forgotten their password, there is no password recovery system in place nor a system which allows a user to obtain a new password.¹⁶¹ Furthermore, there are no systems in place that allow for identification of a user. Therefore, this lack of identification makes the wallets more susceptible to fraud and/or theft.¹⁶² The SARB cautions users from engaging in the use of cryptocurrencies and states that once the data is lost (that is the wallet/ coins) then the virtual currency cannot be regained or retrieved.¹⁶³

There has been no evidence provided by the Venezuelan government on how the Petro will overcome this obstacle. As stated in the following chapter, the Whitepaper: Petro merely states that it will be different from traditional cryptocurrencies, however, there is no evidence to substantiate this.

3.7 Risks Affecting Consumer- Related Transactions

Since cryptocurrency is not bound nor regulated by any laws or policies, this impacts consumer transactions that involves the use of cryptocurrencies. Consumers who transact using cryptocurrencies have no right of recourse.

The SARB states that if there is a transactional error, “the consumer has no recourse against the wallet, exchange or processor.”¹⁶⁴ Furthermore, the SARB states that wallets and exchanges are under no obligation to disclose information to consumers regarding any fees or costs that

¹⁶⁰ M Campbell-Verduyn ‘Bitcoin, Crypto-Coins and Global Anti-Money Laundering Governance’ (2018) *Crime, Law and Social Change* 285.

¹⁶¹ EBA Opinion on ‘Virtual Currencies’ (2014) 28. Available at: <https://eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf>. Date Accessed: 15 March 2018.

¹⁶² EBA Opinion on ‘Virtual Currencies’ (2014) 27. Available at: <https://eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf>. Date Accessed: 15 March 2018.

¹⁶³ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 10. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

¹⁶⁴ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 10. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

they might incur.¹⁶⁵ Consumers are deprived of the privilege of reporting or complaining to any tribunal or commission.

If analysing the consumer legislation in South Africa, such as the Consumer Protection Act 68 of 2008, consumers have a recourse mechanism available whenever they are dissatisfied in terms of a consumer transaction. However, in terms of cryptocurrency transactions, these transactions are permanently stored on the blockchain and cannot be reversed. There is no known mechanism that is available to consumers to recover what they have lost on these networks.

3.8 Electricity Usage

Another disadvantage posed by cryptocurrencies is their high electricity usage. This is a particularly important disadvantage that should be considered by developing countries, and especially those facing energy shortages. It is found that cryptocurrencies consume excessive electricity.¹⁶⁶ Logan Kugler states that “the mining process that create bitcoin uses more energy than Serbia.”¹⁶⁷ Furthermore, it has been found that the mining process on Bitcoin’s network “consumes enough energy to power more than 28 U.S. homes for a day.”¹⁶⁸ During the mining process, various computers will attempt at solving a mathematical algorithm.¹⁶⁹ This mining process, as well as the verification of transactions on the cryptocurrency network, requires extensive computational power, thus consuming high volumes of electricity.¹⁷⁰ Kugler finds that mining bitcoin for one month would use roughly 1,375kW of electricity.¹⁷¹ This would cost the user about 118 USD¹⁷², which is roughly 1700,82 ZAR. This could negatively affect

¹⁶⁵ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 10. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

¹⁶⁶ L Kugler ‘Why Cryptocurrencies Use So Much Energy- And What to do About it’ (2018) 61(7) *Communications of the ACM* 15.

¹⁶⁷ L Kugler ‘Why Cryptocurrencies Use So Much Energy- And What to do About it’ (2018) 61(7) *Communications of the ACM* 15.

¹⁶⁸ L Kugler ‘Why Cryptocurrencies Use So Much Energy- And What to do About it’ (2018) 61(7) *Communications of the ACM* 15.

¹⁶⁹ L Kugler ‘Why Cryptocurrencies Use So Much Energy- And What to do About it’ (2018) 61(7) *Communications of the ACM* 16.

¹⁷⁰ L Kugler ‘Why Cryptocurrencies Use So Much Energy- And What to do About it’ (2018) 61(7) *Communications of the ACM* 16.

¹⁷¹ L Kugler ‘Why Cryptocurrencies Use So Much Energy- And What to do About it’ (2018) 61(7) *Communications of the ACM* 16.

¹⁷² L Kugler ‘Why Cryptocurrencies Use So Much Energy- And What to do About it’ (2018) 61(7) *Communications of the ACM* 16.

those countries facing an energy crisis. Furthermore, this factor could dissuade potential countries from adopting a sovereign cryptocurrency.

3.9 Case Law

Various incidents have been investigated regarding cryptocurrency and its association with illicit activities. The most prominent case known is the Silk Road case (which is a US case) which surrounds various issues such as money laundering and sale of illicit goods.

3.9.1 US v Ulbricht¹⁷³ (Silk Road)

Silk Road is part of the Dark Web and was designed and administered by Ross Ulbricht. Silk Road provided a platform for anonymous and illegal trading of drugs and pharmaceuticals.¹⁷⁴ The Dark Web can be defined as “the online marketplaces which are not accessible through the traditional search engines such as Google, and therefore operate in the space called the Deep Web.”¹⁷⁵

In the case of US v. Ulbricht¹⁷⁶, Ross Ulbricht was charged by the grand jury of the New York District court on four counts for “participation in a narcotics trafficking conspiracy, a continuing criminal enterprise, a computer hacking conspiracy and a money laundering conspiracy.”¹⁷⁷

The government claimed that the defendant facilitated and engaged in the activities mentioned above by “designing, launching and administering a website called Silk Road as an online marketplace for illicit goods and services.”¹⁷⁸ Furthermore, the government alleges that the proceeds were laundered by using Bitcoin.¹⁷⁹

As mentioned above, Silk Road was only available via the downloadable software called TOR. TOR allowed for “anonymous, untraceable internet browsing.”¹⁸⁰ Payments were only permissible via Bitcoin as anonymous transactions was a key feature of Bitcoin.

¹⁷³ US v. Ulbricht, 31 F. Supp. 3d.

¹⁷⁴ MC Van Hout, T Bingham ‘Responsible Vendors: Intelligent Consumers: Silk Road, the Online Revolution in Drug Trading’ (2013) 25(2) *International Journal of Drug Policy* 183.

¹⁷⁵ O Nica, K Piotrowska and KR Schenk-Hoppe ‘Cryptocurrencies: Economic Benefits and Risks’ (2017) *University of Manchester, FinTech Working Paper 2 7*.

¹⁷⁶ US v. Ulbricht, 31 F. Supp. 3d 540.

¹⁷⁷ US v. Ulbricht, 31 F. Supp. 3d 546.

¹⁷⁸ US v. Ulbricht, 31 F. Supp. 3d 540.

¹⁷⁹ US v. Ulbricht, 31 F. Supp. 3d 540.

¹⁸⁰ US v. Ulbricht, 31 F. Supp. 3d 546.

In response to the allegations put forward by the government, Ulbricht argues that he was merely an intermediary and not a seller or buyer of the illegal goods.¹⁸¹

Ulbricht had furthered argued that payments made in Bitcoins cannot be a financial transaction to which the court disagreed. In response this argument, the court had importantly stated that,

“The fact that Bitcoins allow for anonymous transactions does not *ipso facto* mean that those transactions relate to unlawful activities. The anonymity by itself is not a crime. Rather, Bitcoins are alleged here to be the medium of exchange—just as dollars or Euros could be—in financial transactions relating to the unlawful activities of narcotics trafficking and computer hacking. It is the system of payment designed specifically to shield the proceeds from third party discovery of their unlawful origin that forms the unlawful basis of the money laundering charge.”¹⁸²

This statement made by the court is important to understand as the characteristic of anonymous transactions is not entirely prejudicial to users. This characteristic is dependent on how individuals make use of such characteristic. As the court stated above, anonymous transactions are not automatically unlawful. Anonymous transactions are unlawful depending on the nature of transactions that individuals engage in.

3.10 Conclusion

As seen in this chapter, there are advantages of cryptocurrencies that could potentially benefit businesses as well as the governments of countries. Cryptocurrencies have the ability of reducing the transaction fees thus enabling businesses to conclude more transactions at a lower cost. There are, however, numerous risks associated with the use of cryptocurrencies. These risks have the potential of having a detrimental effect on both the individuals as well as for any countries participating or contemplating participation in cryptocurrencies. Therefore, it is crucial for any country to consider the risks of traditional cryptocurrencies before adopting a sovereign cryptocurrency as the same risks may be applicable. Instead of the sovereign cryptocurrencies benefitting a country it may have the opposite effect thus causing more damage than intended. These risks are often the rationale behind the various countries’ caution against the use of cryptocurrencies. Hence, it is necessary to consider the impact of a sovereign cryptocurrency for a developing country and whether the risks mention in this chapter will play a role. The following chapter will analyse and critique the Petro which will be essential in the

¹⁸¹ US v. Ulbricht, 31 F. Supp. 3d.

¹⁸² US v. Ulbricht, 31 F. Supp. 3d 569.

determination of whether a sovereign cryptocurrency will be recommended for introduction in South Africa/ developing countries.

CHAPTER 4

PETRO - THE VENEZUELAN SOVEREIGN CRYPTOCURRENCY

4.1 Introduction

The New York Times pertinently describes Venezuela as “A once prosperous nation that’s now on the brink of collapse.”¹⁸³ Venezuela was a once wealthy country, essentially one of the wealthiest in South America.¹⁸⁴ In early 2018, Venezuela introduced the Petro which is an oil-backed cryptocurrency.¹⁸⁵ The government claims that this creation will impact the economy positively and hopefully restore the country to its former glory.¹⁸⁶ There are reservations surrounding the Petro as there is speculation that it is a means for the Venezuelan government to avoid or bypass the sanctions imposed on them by the US government.¹⁸⁷ This chapter will briefly analyse the Venezuelan economy and whether the Petro will have a positive impact on its economy. This chapter will thereafter serve as an aid in analysing whether South Africa should develop its own sovereign cryptocurrency.

4.2 Background on Venezuela

The South American country of Venezuela can be described as follows,

“with a population of around thirty million, living over a territory of one million square kilometres. It has been blessed with a diversity and abundance of natural resources such as gold, iron, diamonds, forests and great rivers.”¹⁸⁸

Varnagy-Rado states that Venezuela is situated in a prime location in the “north of South America, near the world’s largest markets.”¹⁸⁹

¹⁸³ P Smith ‘Venezuela in Crisis: With its economy in free fall and a government looking more and more like a dictatorship, Venezuela is on the brink of disaster’ (2017); 149(13); *New York Times Upfront*; 13. Available at: <http://search.ebscohost.com.ukzn.idm.oclc.org/login.aspx?direct=true&db=f5h&AN=123067627&site=ehost-live>. Date Accessed: 2 March 2019.

¹⁸⁴ A Gutierrez ‘Venezuela’s Economic and Social Development in the Era of Chavism’ (2017) 8(2) *Latin American Policy* 161.

¹⁸⁵ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

¹⁸⁶ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

¹⁸⁷ M Chandler ‘Venezuela’s Cryptocurrency is a Desperate Gimmick’ (2018) <http://www.marctomarket.com/2018/02/venezuelas-cryptocurrency-is-desperate.html?q=Venezuela%27s>. Date Accessed: 21 August 2018.

¹⁸⁸ D Varnagy-Rado ‘Economy of Venezuela in 2010: Instruments of National Political Goals’ (2011) 8(2) *Megatrend Review* 34.

¹⁸⁹ D Varnagy-Rado ‘Economy of Venezuela in 2010: Instruments of National Political Goals’ (2011) 8(2) *Megatrend Review* 34-35.

Venezuela is rich in numerous natural resources, however upon the discovery of oil, Venezuela became an oil dependent country.¹⁹⁰ Studies have shown that countries that have abundant natural resources undergo a slow and low economic growth to which can be attributed to corruption and inadequate institutions in the state.¹⁹¹ This essential information will serve as a background surrounding Venezuela's current economic plight.

4.3 Venezuela's Financial Status and Oil Industry

As previously stated, Venezuela has an abundance of natural resources. This proved to be advantageous for the country. By the 1970s, Venezuela had become one of the 20th wealthiest country in the world.¹⁹² This period of good fortune, however, did not last very long. During this time the Venezuelan government relied on income from external sources as opposed to obtaining income from taxing its citizens and other internal sources of revenue.¹⁹³ As a result of this, the citizens have little say in the actions of the government which has an impact on the checks and balances of the government.¹⁹⁴ In 1976 the government nationalised the oil industry.¹⁹⁵ The challenges of the state controlling the oil industry were found to be as follows, "renewed state control over the oil industry and the upward trend in oil prices led to the rapid appreciation of the exchange rate and the overvaluation of the Bolivar."¹⁹⁶

From 1970 to the early 2000s, the oil industry's activity and performance was inconsistent. In 2003, the Venezuelan oil industry experienced a strike which had a crippling effect on the rest of the country's economy.¹⁹⁷ The purpose of this strike was to pressurise the former president of Venezuela, Hugo Chàvez and the government to make changes in various policies.¹⁹⁸ In 1970 Venezuela produced a mass amount of up to 3700 barrels of oil per day (b/d), whereas

¹⁹⁰ TF Purcell 'The Political Economy of Rentier Capitalism and the Limits to Agrarian Transformation in Venezuela' (2016) 17(2) *Journal of Agrarian Change* 296.

¹⁹¹ B Agnani and A Iza 'Growth in an Abundant Economy: The Case of Venezuela' (2011) 14(1) *Journal of Applied Economics* 63.

¹⁹² A Gutierrez 'Venezuela's Economic and Social Development in the Era of Chavism' (2017) 8(2) *Latin American Policy* 161.

¹⁹³ A Gutierrez 'Venezuela's Economic and Social Development in the Era of Chavism' (2017) 8(2) *Latin American Policy* 162.

¹⁹⁴ A Gutierrez 'Venezuela's Economic and Social Development in the Era of Chavism' (2017) 8(2) *Latin American Policy* 161.

¹⁹⁵ JF Rochlin 'Who Said the Cold War is Over? The Political Economy of Strategic Conflict Between Venezuela and Colombia' (2011) 32(2) *Third World Quarterly* 241.

¹⁹⁶ TF Purcell 'The Political Economy of Rentier Capitalism and the Limits to Agrarian Transformation in Venezuela' (2016) 17(2) *Journal of Agrarian Change* 302.

¹⁹⁷ A Gutierrez 'Venezuela's Economic and Social Development in the Era of Chavism' (2017) 8(2) *Latin American Policy* 170.

¹⁹⁸ A Gutierrez 'Venezuela's Economic and Social Development in the Era of Chavism' (2017) 8(2) *Latin American Policy* 170.

in 2010 Venezuela was producing an estimated 2300 barrels of oil per day.¹⁹⁹ This indicates that in a period of forty years, the oil production decreased by 1400 b/d.

By 2015, however, Venezuela was experiencing a decline in the economy with issues such as food scarcity and triple-digit inflation becoming prevalent.²⁰⁰ In 2017, the government, introduced a sovereign cryptocurrency backed by the oil reserves of the country to ease the effects of its financial crisis and to present a solution to this immense problem.

4.4 Petro

Venezuela is the first country in the world to have a sovereign cryptocurrency. This part of the paper analyses the Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’. The benefits as well as the shortcomings of the Petro will be analysed. In addition, the technology that the Petro is based on will be critiqued as well.

4.4.1 What is Petro?

The Petro (PTR) is a sovereign cryptocurrency²⁰¹ which is backed by raw materials, more specifically by oil.²⁰² The Whitepaper: Petro²⁰³ describes the Petro as follows:

“Petro is a sovereign crypto asset backed and issued by the Venezuelan State as a spearhead for the development of an independent, transparent and open digital economy open to direct participation of citizens. It will also serve as a platform for the growth of a fairer financial system that contributes to development, autonomy and trade between emerging economies.”²⁰⁴

¹⁹⁹ D Varnagy-Rado ‘Economy of Venezuela in 2010: Instruments of National Political Goals’ (2011) 8(2) *Megatrend Review* 37.

²⁰⁰ TF Purcell ‘The Political Economy of Rentier Capitalism and the Limits to Agrarian Transformation in Venezuela’ (2016) 17(2) *Journal of Agrarian Change* 297.

²⁰¹ A sovereign cryptocurrency is a currency where the central bank of a country issues the digital form of the fiat currency.

Information taken from <https://www.investopedia.com/terms/v/virtual-currency.asp>. Date Accessed: 03 May 2019.

²⁰² Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁰³ The Whitepaper: Petro was released in March 2018 by the Venezuelan government under President Nicolas Maduro. The Whitepaper: Petro states that the idea of the Petro is not a new idea. The idea of introducing a state-backed cryptocurrency was the idea of former president Hugo Chavez. This paper seeks to set out the foundation for the idea as well as the technical aspects relating to the operation of the Petro. The main purpose for creating the Petro, as stated in the paper, is to strengthen the economy. The oil reserves will be used to back the Petro. This is possible because the government owns the oil industry in Venezuela. Furthermore, there is a discussion pertaining to blockchain technology. This is necessary as the Petro is based on blockchain technology, more specifically the NEM blockchain. It is stated by the government, in the paper, that Venezuela is the number one country (out of ten other oil producing countries) with the highest oil reserves.

²⁰⁴ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

The Whitepaper: Petro states that the Petro will be backed by the oil reserves of the country, more specifically by a barrel of oil.²⁰⁵ The Central Bank of Venezuela records the value of one Petro amounting to 36 000 Bolivars (Bs. S).²⁰⁶

According to the Whitepaper: Petro, the main purpose of the Petro is:

“Petro will be an instrument for Venezuela’s economic stability and financial independence, coupled with an ambitious and global vision for the creation of a freer, more balanced and fairer international financial system.”²⁰⁷

As aforementioned, the introduction of Petro, according to the Venezuelan government, is to improve and stabilise its economy.

It is essential to analyse the technology that underlies Petro to understand the difference between mainstream cryptocurrencies and the Petro. Chapter 2 of the Whitepaper: Petro states that the Petro will be based on the blockchain.²⁰⁸ The Whitepaper: Petro states that the blockchain has numerous applications and can be used to store record, data, patents as well as smart contracts.²⁰⁹

4.4.2 Legalities of the Petro

On the 8th of December 2018, the Venezuelan government issued a decree addressing cryptocurrencies, more specifically, Petro.²¹⁰ Decree 3196 of December 8, 2018 permitted the Venezuelan government to develop and issue a country specific cryptocurrency.²¹¹ Petro, as stated above as well, will be supported by the barrels of oil produced by the oil industry of Venezuela, in other words this indicates that one Petro will be supported by one barrel of oil.²¹² Significantly, this decree created the “Superintendent of Venezuelan Crypto-Assets and Related Activities”²¹³ who will supervise all the various facets related to Petro. In terms of this

²⁰⁵ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 12. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁰⁶ Amount taken on 7 March 2019. <http://www.bcv.org.ve/billetes-y-monedas/unidad-de-cuenta> (Date Accessed: 7 March 2019).

²⁰⁷ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁰⁸ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 7. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁰⁹ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 7. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²¹⁰ <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

²¹¹ <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

²¹² <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

²¹³ <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

decree, cryptocurrencies are legal and considered to be financial assets.²¹⁴ This decree further maintains that one in possession of Petro can exchange the market value of the Petro for another cryptocurrency or for bolivars which will be determined according to the exchange rate.²¹⁵ The Petro is similar to other cryptocurrencies in that the holder of a Petro will be required to obtain a virtual wallet.²¹⁶

Although the Venezuelan government is confident in this development, the National Assembly of Venezuela contends otherwise. The National Assembly contends that the releasing of the Petro to the public is illegal because for one to “enter into a public debt and borrow on behalf of the Venezuelan government”²¹⁷ requires the endorsement from the assembly as well as in terms of the Constitution, special law is required.²¹⁸ In addition, according to the National Assembly, the natural resources belong to the country and are “public national assets.”²¹⁹ In light of this information, such assets cannot be used “as guarantee for any debt.”²²⁰

4.4.3 Criticisms of the Petro

This part of chapter 4 will focus on critiquing the Petro. Since there is a lack of material addressing the Petro, criticism will be supported by Marc Chandler’s article, “Venezuela’s Cryptocurrency is a Desperate Gimmick.”²²¹

The first problem observed with the introduction of Petro which warrants notice is the creation of a Superintendent of Cryptocurrency by the Venezuelan government.²²² The error, as noted by Marc Chandler, is appointing a person who possesses insufficient knowledgeable about the concept of cryptocurrencies.²²³

Cryptocurrencies form part of an intricate system which requires much skill and understanding before engaging with such a development. The potential outcome of appointing an individual

²¹⁴ <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

²¹⁵ <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

²¹⁶ <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

²¹⁷ <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

²¹⁸ <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

²¹⁹ <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

²²⁰ <https://www.loc.gov/law/help/cryptocurrency/world-survey.php#venezuela> (Date Accessed: 7 March 2019).

²²¹ M Chandler ‘Venezuela’s Cryptocurrency is a Desperate Gimmick’ (2018) <http://www.marctomarket.com/2018/02/venezuelas-cryptocurrency-is-desperate.html?q=Venezuela%27s>. Date Accessed: 21 August 2018.

²²² M Chandler ‘Venezuela’s Cryptocurrency is a Desperate Gimmick’ (2018) <http://www.marctomarket.com/2018/02/venezuelas-cryptocurrency-is-desperate.html?q=Venezuela%27s>. Date Accessed: 21 August 2018.

²²³ M Chandler ‘Venezuela’s Cryptocurrency is a Desperate Gimmick’ (2018) <http://www.marctomarket.com/2018/02/venezuelas-cryptocurrency-is-desperate.html?q=Venezuela%27s>. Date Accessed: 21 August 2018.

who barely understands the details surrounding such a topic, could result in the downfall of the cryptocurrency. Furthermore, cryptocurrencies are highly technical which requires much technical skill and understanding to effectively ensure the success of such a development.

As mentioned above, Petro is based on blockchain technology. The Petro used the NEM blockchain (NEM is the acronym for ‘New Economy Movement’)²²⁴ during its initial coin offering (ICO).²²⁵ According to the Venezuelan government, the NEM blockchain is the preferred choice to base the Petro cryptocurrency on as it combines the technology of both Bitcoin and Ethereum, thus making it a stronger blockchain.²²⁶ NEM is a “platform of blockchain services”²²⁷ and is noted to be one of the easiest blockchain to use.²²⁸ Venezuela, is relying on a system that has already been used instead of developing their own blockchain that would be unique to the Petro.²²⁹ It has been stated that the technology behind NEM is so straightforward that an individual does not need extensive training to use this blockchain.²³⁰ An individual who understands the basics behind such technology will be able to use the NEM blockchain within a day.²³¹ Therefore, it can be deduced that due to the government’s lack of knowledge in the area, the Venezuelan government chose to use a blockchain that is simple to use and which does not require much training.

The Whitepaper: Petro, however, goes on to list reasons explaining their choice to use NEM over the Ethereum blockchain. One such reason is the transaction costs of Ethereum are too high. In addition, the number of confirmed transactions per second on Ethereum is relatively low whereas NEM confirms about four thousand transactions per second.²³² Venezuela asserts that their system for the Petro will be strong and will fix the issues faced by traditional financial systems. The government states,

²²⁴ <https://coincentral.com/what-is-nem/>. Date Accessed: 4 May 2019.

²²⁵ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 13. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²²⁶ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 23. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²²⁷ <https://nemflash.io/nem-petro-nem-latam-explains/>. Date Accessed: 4 May 2019.

²²⁸ <https://nemflash.io/nem-petro-nem-latam-explains/>. Date Accessed: 4 May 2019.

²²⁹ M Chandler ‘Venezuela’s Cryptocurrency is a Desperate Gimmick’ (2018) <http://www.marctomarket.com/2018/02/venezuelas-cryptocurrency-is-desperate.html?q=Venezuela%27s>. Date Accessed: 21 August 2018.

²³⁰ <https://nemflash.io/nem-petro-nem-latam-explains/>. Date Accessed: 4 May 2019.

²³¹ <https://nemflash.io/nem-petro-nem-latam-explains/>. Date Accessed: 4 May 2019.

²³² Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 23. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

“Petro will have the capacity to overcome blockages, delays and limitations of the traditional financial system, favoring the growth of a new economic ecosystem based on trust, integrity, transparency, efficiency and speed that guarantees the technology of blockchains.”²³³

The blockchain pertaining to the Petro aims for a “transparent system” however, with the blockchain and cryptocurrency systems, anonymity is the ‘selling point.’ (An explanation of blockchain technology is given in chapter 2). These systems allow the users behind the transactions to conceal their identity thus allowing them to be anonymous. Therefore, to be transparent and to achieve transparency in transactions, it is impossible to implement a system that offers and thrives on anonymity. This feature will open the floodgates for an entire range of illegal activity and trading.

Chandler criticises the Venezuelan government’s efforts by stating that “it is just a gimmick that cashes in on the current crypto craze.”²³⁴ There is no evidence put forward by the government nor is there any evidence in the Whitepaper: Petro demonstrating how the Petro will impact the financial status of the country. There is a mere repetition that the Petro will improve the country's economy but there is a lack of evidence to substantiate this assertion.

There are numerous allegations that Venezuela released their sovereign cryptocurrency to avoid the sanctions imposed on the country by the US government.²³⁵ The first sanction was imposed in 2015 by former President Barack Obama which extended to the Venezuelan government and the Venezuelan oil industry.²³⁶ This sanction was imposed as a result of the numerous human rights violations that are occurring in Venezuela.²³⁷ However, in March 2018, after Donald Trump was elected into office, he strengthened the sanctions. President Trump, of the United States of America, signed an Executive Order which imposed economic sanctions on Venezuela.²³⁸ This sanction prohibits any US citizen from entering into any transactions with Venezuela, be it with digital currencies or with fiat (traditional) currencies.²³⁹

²³³ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 5. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²³⁴ M Chandler ‘Venezuela’s Cryptocurrency is a Desperate Gimmick’ (2018) <http://www.marctomarket.com/2018/02/venezuelas-cryptocurrency-is-desperate.html?q=Venezuela%27s>. Date Accessed: 21 August 2018.

²³⁵ <https://www.bbc.com/news/world-latin-america-47104508>. Date Accessed: 4 May 2019.

²³⁶ I Hernandez ‘Venezuela and U.S. Sanctions: Some Considerations’ (2018) *IAEE* 9.

²³⁷ I Hernandez ‘Venezuela and U.S. Sanctions: Some Considerations’ (2018) *IAEE* 9.

²³⁸ J Galbraith ‘United States Imposes Broad Economic Sanctions on Venezuela After Constitutional Crisis’ (2018) 112(1) *American Journal of International Law* 103.

²³⁹ I Hernandez ‘Venezuela and U.S. Sanctions: Some Considerations’ (2018) *IAEE* 11.

North Americans (United States [USA] citizens) are cautioned against investing in the Petro as it is “an extension of credit to the Venezuelan government...”²⁴⁰ If Americans invest in the Petro they are at risk of facing legal challenges.

Venezuela relies on its raw materials, namely crude oil, to support the Petro. President Maduro stated that 1,5 billion barrels of oil will be used to support the Petro.²⁴¹ The Whitepaper: Petro substantiates that the Petro will be backed by the country’s oil assets.²⁴²

After the Great Depression, countries abandoned the gold standard²⁴³ to avoid another crisis like the Great Depression. The Whitepaper: Petro claims that after the gold standard²⁴⁴ was abandoned, it had a severe impact on developing countries.²⁴⁵ The decision to abandon the gold standard was made by the stronger economies of the world such as the United Kingdom. Developing countries are thus reliant on the decisions made by these stronger economies, which is detrimental to these developing economies. The Whitepaper: Petro states that there is an urgent need to decrease the dependence of developing countries on the stronger economic countries.²⁴⁶ Venezuela’s current economic and financial status can bear testament to the detrimental effects of relying on the countries with a stronger economy, such as the USA for example.

There is a distinction between cryptocurrencies and tokens which is explained in the Whitepaper: Petro. Cryptocurrencies are explained as follows, it consists of “digital assets

²⁴⁰ M Chandler ‘Venezuela’s Cryptocurrency is a Desperate Gimmick’ (2018) <http://www.marctomarket.com/2018/02/venezuelas-cryptocurrency-is-desperate.html?q=Venezuela%27s>. Date Accessed: 21 August 2018.

²⁴¹ L Gedeye ‘Genius Plan or Political Game? - Currencies’ (2018) 11 *finweek* 41.

²⁴² Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 12. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁴³ Prior to the Great Depression, countries were using the gold standard. Under the gold standard each country set the value of their currency based on the weight of gold. In terms of this standard, the currency exchange rates were fixed according to their values determined in gold. The gold standard, unfortunately, had caused the financial problem of the USA to have a ripple effect on other countries.

Information taken from *Bank. The World Book Encyclopedia* (2010) 339.

²⁴⁴ The gold standard is relevant to this research as Bitcoin was designed based on the gold standard. The similarity is found in the idea behind limiting the supply of bitcoins that can be mined on the network, which is 21 million bitcoins. When the limit is reached, it is stated that the cryptocurrency becomes inflation free. Taking into account Venezuela’s state of hyperinflation, this substantiates the country’s reasoning behind creating their own cryptocurrency.

Information taken from: O Nica, K Piotrowska and KR Schenk-Hoppe ‘Cryptocurrencies: Economic Benefits and Risks’ (2017) *University of Manchester, FinTech Working Paper 2 3*. Available at: <https://ssrn.com/abstract=3059856>.

²⁴⁵ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 6. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁴⁶ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 6. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

designed to work as a means of exchange that uses cryptography to secure your transactions, to control the creation of new units and to verify the transfer of these units.”²⁴⁷

Cryptography, in simple terms, is the encryption code that is used in a programme. Cryptography can be explained as being the science that renders the communication indecipherable by all third parties²⁴⁸. In other words, cryptography ensures that unauthorized parties cannot read or decipher the messages.

Tokens are explained as follows,

“is a unit of value that an organization creates to govern its business model and give its users more power to interact with its products, while facilitating the distribution and sharing of profits among all its shareholders. In the case of digital tokens, the accounting and relationship of the token with the ecosystem around the productive activity is found on the blockchain of some cryptocurrency, as Ethereum, which mediates the relationship of the token with the real economy and the fiduciary currencies, although this relationship does not have to be permanent.”²⁴⁹

It is stated that tokens are not widely used and accepted by businesses and corporate entities, and as a result of this, the Venezuelan government intends on implementing measures to ensure that the Petro is used as a medium of payment.²⁵⁰ Taking this statement into consideration, there is a lack of evidence demonstrating whether the Petro will be accepted as a form of payment by suppliers in the country. It is stated that Petro can be "used to purchase goods and or services and will be redeemable for fiat money and other crypto assets through digital exchange houses."²⁵¹ There is no evidence, however, indicating whether it has partnered with other entities to ensure that Petro can be used and traded compared to the likes of Bitcoin and Ripple.

The paper records the trends in three cryptocurrencies, namely: Bitcoin, Ripple, and Ethereum. These records show the increases and declines in the prices of these cryptocurrencies which are based on how the cryptocurrency market is functioning. The main emphasis that the

²⁴⁷ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 8. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁴⁸ J Hofman...et al. *Cyberlaw: A Guide for South Africans doing Business online* (1999) 64.

²⁴⁹ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 8. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁵⁰ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 2. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁵¹ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 12. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

Venezuelan government seeks to show is the volatility of the mainstream cryptocurrencies. It seeks to show that the Petro will not be susceptible to the issues faced by these cryptocurrencies. The paper states that Petro will be stronger and trustworthy as it will be based on blockchain technology. However, most, if not all, of the traditional currencies operate and use blockchain technology. It is stated that by using blockchain technology it will foster more growth and trust, however, Bitcoin, for example, is based on blockchain which makes the argument put forward by the Venezuelan government nonsensical.

The problem with introducing a sovereign cryptocurrency is that it defeats the purpose of a cryptocurrency. When Bitcoin was introduced, it was introduced to be independent of the government and government institutions. The Venezuelan state will issue Petro which indicates that there is state interference or regulation regarding Petro.²⁵² Furthermore, Venezuela has nationalised its mines which means that these mines are controlled by the government hence, also indicating that there will be government interference. By backing a cryptocurrency with the country's oil reserves, it means that there will be government interference. This is in blatant disregard of the purpose of cryptocurrencies.

4.5 Conclusion

From the above discussion, it is clear that Venezuela is making every endeavour to relieve its country's financial crisis by introducing the Petro. This analysis illustrated more downfalls or problems of the Petro than any advantages. Furthermore, it becomes difficult to analyse the success and pitfalls of Petro when there is a lack of statistics provided. One drawback that is alarming is the issuance of Decree 3196. This decree was issued several months after the initial offering of Petro and after it was introduced to the country. There should have been a bill or draft law drafted specifically for the Petro.

As argued above, cryptocurrencies were designed to be independent of any government interference and the development of the Petro does the opposite. The Petro is a government funded and supported cryptocurrency which evidently defeats the purpose of a cryptocurrency.

The following chapter focusses on South Africa (which is a developing country). The circumstances which will either enable or hinder the country from implementing a sovereign cryptocurrency will be analysed.

²⁵² L Gedeye 'Genius Plan or Political Game? - Currencies' (2018) 11 *finweek* 41.

CHAPTER 5

IMPACT OF DEVELOPING A SOVEREIGN CRYPTOCURRENCY ON DEVELOPING COUNTRIES

5.1 Introduction

As seen in the previous chapter, the Venezuelan government issued a whitepaper introducing the country specific cryptocurrency, Petro, to salvage the economy. The Republic of the Marshall Islands promulgated legislation to regulate the introduction of a national cryptocurrency called SOV or Sovereign. This will be analysed briefly, and it will be compared to the Petro. The Australian Treasury Department released a document analysing ICOs. This will be briefly examined in this chapter. It is important to note that whilst various countries will be analysed, the focus will remain on South Africa.

South Africa is a country that is overwhelmed with poverty, unemployment, crime, and corruption amongst others.²⁵³ In 2017 and 2018, South Africa's credit rating was reduced to junk status.²⁵⁴ This impacted on numerous sectors in the country and it played a major role in the foreign investment in the country.²⁵⁵ This credit rating of 'junk' status illustrated the "slowing economy, weakening institutional frameworks and erosion of fiscal strength as key drivers of the downgrade." It has been argued that cryptocurrencies can revolutionise the financial markets in developing countries.²⁵⁶ Therefore, it is necessary to analyse whether cryptocurrency, especially a sovereign cryptocurrency, would be beneficial for South Africa. This chapter will begin by briefly examining the forms of regulation of cryptocurrencies in other countries.

5.2 The Republic of The Marshall Islands

In 2018, the Republic of the Marshall Islands (hereinafter referred to as 'RMI') introduced the 'Declaration and Issuance of the Sovereign Currency Act 2018' (hereinafter referred to as 'DISCA'). This eight-page document deals with the issuance of a sovereign cryptocurrency in

²⁵³ F Tregenna 'A New Growth Path for South Africa?' (2011) 38(130) *Review of African Political Economy* 627.

²⁵⁴ C Honeyborne 'Investing in South Africa: The Road to 2025' (2017) *Without Prejudice* 8.

²⁵⁵ C Honeyborne 'Investing in South Africa: The Road to 2025' (2017) *Without Prejudice* 8.

²⁵⁶ A Walton and K Johnston 'Exploring Perceptions of Bitcoin Adoption: The South African Virtual Community Perspective' (2018) 13 *Interdisciplinary Journal of Information, Knowledge & Management* 166.

the RMI. The RMI's cryptocurrency is referred to as 'sovereign' or 'SOV'. This part of the research will briefly cover the applicable aspects of the DISCA and compare it to the Petro.

Firstly, Section 102 of the DISCA²⁵⁷ deals with the purpose of the act, which is as follows "To declare and issue a digital decentralized currency based on blockchain technology as legal tender." This is important as the act declares that the cryptocurrency will be akin to banknotes and coins. The RMI declares that the SOV will be legal tender, which is reiterated in section 103(a) of DISCA. The legal tender of the RMI is the US dollar, however, the SOV will be circulated "in addition to the US Dollar." Regarding legal tender, section 104 of DISCA states that the SOV can be used to pay for goods and services.²⁵⁸ Furthermore, section 105(5) states that residents will be able to enter into transactions using the SOV and merchants will be provided with the necessary equipment to enable them to facilitate such transactions. Section 104 and 105 indicates the practicality of the cryptocurrency. Importantly, users of SOV will be required to disclose their identity which is different to that of cryptocurrencies such as Bitcoin.²⁵⁹ Therefore, anonymity will not be a factor regarding the SOV.

The SOV differs from the Petro in that there is no legislation governing the Petro. Additionally, the SOV is not asset-backed like the Petro. The SOV is based on blockchain technology²⁶⁰ whereas the Venezuelan government used the NEM blockchain for the Petro.²⁶¹ The DISCA states that the SOV can be used for goods and services and states that merchants will obtain necessary equipment to conduct such transactions.²⁶² The Venezuelan government, however, makes no mention of the details surrounding transactions made with the Petro.

5.3 Australia

The Australian Treasury department released a document in 2019 addressing ICOs.²⁶³ This document addresses various risks and benefits that many businesses, such as start-up

²⁵⁷ Declaration and Issuance of the Sovereign Currency Act 2018.

²⁵⁸ Declaration and Issuance of the Sovereign Currency Act 2018, section 104(1).

²⁵⁹ <https://www.dw.com/en/sovereign-cryptocurrency-marshall-islands-to-launch-world-first-digital-legal-tender/a-42810832-0>.

²⁶⁰ Declaration and Issuance of the Sovereign Currency Act 2018, section 102.

²⁶¹ Venezuelan Financial and Technology Proposal 'Whitepaper: Petro' (2018) 13. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁶² Declaration and Issuance of the Sovereign Currency Act 2018, section 105(5).

²⁶³ The Australian Government The Treasury 'Initial Coin Offerings: Issues Paper' (2019). Available at: https://treasury.gov.au/sites/default/files/2019-03/c2019-t353604-Issues_Paper-1.pdf. Date Accessed: 15 July 2019.

businesses, may attract. This document importantly acknowledges that ICOs have resulted in many scams which over the years.²⁶⁴ Considering the rate of illiteracy and poverty in developing countries, this would be a factor to consider.

The Australian government, however, identifies the advantages of ICOs such as the addition of new services to the market. Since this is a highly specialised field it would attract law firms as well as other services to invest in such an area thus allowing for specialists to enter the market.²⁶⁵ Considering the rate of unemployment in South Africa as well as the number of graduates who are unemployed, this can be an area for further development in South Africa.

The Australian government states that ICOs are regulated in terms of consumer law (Competition and Consumer Act 2010 (Commonwealth)) provided they are not financial products or services.²⁶⁶ On the contrary, if such products or services are financial in nature then it will be governed by the Australian Securities and Investments Commission Act 2001.²⁶⁷ The Chartered Accountants Australian and New Zealand released a statement responding to the paper released by the Australian Treasury whereby they state that those issuing out ICOs have the ability to manipulate the digital tokens in a manner whereby the least amount of regulation will be applicable.²⁶⁸

The Venezuelan government has not issued any statement nor any guidelines stating if the Venezuelan consumer law will apply to transactions made with the Petro. This is problematic as there is no right of recourse provided to the users of such currency. In South Africa, cryptocurrencies are not regulated in terms of consumer law or in terms of securities and investments.

²⁶⁴ The Australian Government The Treasury 'Initial Coin Offerings: Issues Paper' (2019).6. Available at: https://treasury.gov.au/sites/default/files/2019-03/c2019-t353604-Issues_Paper-1.pdf. Date Accessed: 15 July 2019.

²⁶⁵ The Australian Government The Treasury 'Initial Coin Offerings: Issues Paper' (2019).6. Available at: https://treasury.gov.au/sites/default/files/2019-03/c2019-t353604-Issues_Paper-1.pdf. Date Accessed: 15 July 2019.

²⁶⁶ The Australian Government The Treasury 'Initial Coin Offerings: Issues Paper' (2019). 9. Available at: https://treasury.gov.au/sites/default/files/2019-03/c2019-t353604-Issues_Paper-1.pdf. Date Accessed: 15 July 2019.

²⁶⁷ The Australian Government The Treasury 'Initial Coin Offerings: Issues Paper' (2019). 9. Available at: https://treasury.gov.au/sites/default/files/2019-03/c2019-t353604-Issues_Paper-1.pdf. Date Accessed: 15 July 2019.

²⁶⁸ https://treasury.gov.au/sites/default/files/2019-04/c2019-t353604-chartered_accountants.pdf. Date Accessed: 17 July 2019.

5.4 South African Law

To consider whether following the Petro would be feasible, it is necessary to examine South African legislation pertaining to the financial sector of the country. The SARB states that as a result of the strong regulation in South Africa, the country's financial sector was not severely affected by the 2008 financial crisis.²⁶⁹ Cryptocurrency relates to the payment and banking sector, it is therefore necessary to analyse the financial legislation. It is important to note that cryptocurrency is not regulated in South Africa. The legislation that pertains to banking and currency are as follows:

- The South African Reserve Bank Act 90 of 1989;
- The National Payment System Act 78 of 1998 which regulates the payment systems, clearing systems and settlement systems in South Africa²⁷⁰; and
- The Currency and Exchanges Act 9 of 1933 which regulates legal tender as well as the banking system in South Africa.²⁷¹

5.5 The South African Reserve Bank

The SARB is the central bank of South Africa and is established in terms of section 223 of the Constitution of the Republic of South Africa, 1996 ("Constitution"). In terms of section 224 of the Constitution,²⁷² the powers of the SARB is to "protect the value of the currency."²⁷³

Section 223 makes provision for the regulation of the SARB in terms of an Act of Parliament²⁷⁴ which is therefore the South African Reserve Bank Act 90 of 1989. Section 10(1)(a) of the Act²⁷⁵ lists the powers and duties of the SARB,²⁷⁶ which includes the issuing of currency in South Africa.

²⁶⁹ South African Reserve Bank, "Project Khokha–Exploring the use of distributed ledger technology for interbank payments settlement in South Africa." (2018). 16. Available at: https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/8491/SARB_ProjectKhokha%20180605.pdf. Date Accessed: 9 September 2018.

²⁷⁰ A Itzikowitz and I Meiring 'Banking Regulation 2019: South Africa' Available at: <https://www.globallegalinsights.com/practice-areas/banking-and-finance-laws-and-regulations/south-africa>. Date Accessed: 02 April 2019.

²⁷¹ A Itzikowitz and I Meiring 'Banking Regulation 2019: South Africa' Available at: <https://www.globallegalinsights.com/practice-areas/banking-and-finance-laws-and-regulations/south-africa>. Date Accessed: 02 April 2019.

²⁷² Constitution of the Republic of South Africa, 1996.

²⁷³ Constitution of the Republic of South Africa, 1996.

²⁷⁴ Constitution of the Republic of South Africa, 1996.

²⁷⁵ South African Reserve Bank Act 90 of 1989.

²⁷⁶ "(1) The Bank may, subject to the provisions of section 13-

(a) (i) make banknotes or cause banknotes to be made;

(ii) coin coins or cause coins to be coined;

(iii) issue banknotes and coins, or cause banknotes and coins to be issued, for use in the Republic;

Section 14(1) of the Act also states that:

“(1) The Bank shall have the sole right to issue or cause to be issued banknotes and coins in the Republic: Provided that all coins which at the commencement of the South African Reserve Bank Amendment Act, 1989, were lawfully in circulation and legal tender in the Republic, shall as such remain in circulation until they are withdrawn from circulation in accordance with the provisions of section 19, or are no longer of the current mass prescribed in Schedule 2 in respect of the denomination in question.”

5.5.1 Position Paper on Virtual Currencies

In 2014, the SARB and National Payment Systems Department released a position paper on virtual currencies declaring the bank’s stance regarding cryptocurrencies.²⁷⁷ The Paper stated that cryptocurrencies are not considered legal tender and “should not be used as payment for the discharge of any obligation in a manner that suggests they are perfect substitute of legal tender.”²⁷⁸

The Paper discusses the risks associated with cryptocurrencies and states that while there are numerous advantages to cryptocurrencies, there are many risks as well.²⁷⁹ The SARB states that cryptocurrencies have the potential of disrupting the financial system.²⁸⁰ Some of the risks identified in the paper are consumer risks, price volatility, anti-laundering and terrorist financing.²⁸¹ Although there are numerous risks attached to cryptocurrencies, there are

(iv) make, or cause to be made, banknotes to be issued for use in another State, and coin, or cause to be coined, coins to be so issued; and

(v) destroy banknotes and coins or cause them to be destroyed;”

²⁷⁷ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014). Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

²⁷⁸ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 4-5. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

²⁷⁹ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 5. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

²⁸⁰ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 5. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

²⁸¹ South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 5-12. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

arguments that cryptocurrencies can positively impact individuals living in developing countries as this provides access to payment and savings facilities.²⁸² Conclusively, the SARB holds that currently there is no threat by cryptocurrencies to the economy.²⁸³ However, considering South Africa's current economic crisis, it would be beneficial to assess whether Venezuela's model would be a viable option to consider.

5.5.2 Project Khokha

In the first half of the year 2018, the SARB launched Project Khokha which was an experiment using distributed ledger technology (DLT). The project included seven banks from South Africa namely: ABSA, Standard Bank, Capitec, Discovery Bank, FirstRand Bank, Investec and Nedbank.²⁸⁴ The SARB stated that the main aim of this project "was to build a Proof-of-Concept (PoC) wholesale payment system for interbank settlement using a tokenised South African rand on distributed ledger technology (DLT)."²⁸⁵ This method would be advantageous in that the transactional costs between the banks would decrease.

The rationale behind Project Khokha was to gain more insight into the cryptocurrency world and blockchain technology. The project made a digital version of the rand rather than creating a sovereign cryptocurrency. It can be argued that the project was not independent of the rand, it was just a digital token. Project Khokha was an experiment in finding another way in which to pay. There was no mention of the token rand being decentralised, which is a key feature of cryptocurrencies. It was not decentralised, still had to go through clearing houses, which are the banks.

This project however, has indicated that the SARB is embracing the concept of cryptocurrencies, albeit it being hesitant.

²⁸² A Walton and K Johnston 'Exploring Perceptions of Bitcoin Adoption: The South African Virtual Community Perspective' (2018) 13 *Interdisciplinary Journal of Information, Knowledge & Management* 166.

²⁸³ South African Reserve Bank 'Position Paper on Virtual Currencies' (2014) 12. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

²⁸⁴ South African Reserve Bank, "Project Khokha—Exploring the use of distributed ledger technology for interbank payments settlement in South Africa." (2018). 9. Available at: https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/8491/SARB_ProjectKhokha%2020180605.pdf. Date Accessed: 9 September 2018.

²⁸⁵ South African Reserve Bank, "Project Khokha—Exploring the use of distributed ledger technology for interbank payments settlement in South Africa." (2018). 6. Available at: https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/8491/SARB_ProjectKhokha%2020180605.pdf. Date Accessed: 9 September 2018.

5.6 The Electronic Communications and Transactions Act 25 Of 2002

The Electronic Communications and Transactions Act 25 of 2002 (hereinafter referred to as the ‘ECT Act’ or the ‘Act’) was enacted to facilitate and regulate electronic means of communicating and transacting.²⁸⁶ A brief analysis of applicable provisions of this Act will be provided and the effect it could have on transactions involving cryptocurrency.

Section 1 of the ECT Act defines key terms that is found in the act. The term ‘consumer’ is defined as, “any natural person who enters or intends entering into an electronic transaction with a supplier as the end user of the goods or services offered by that supplier.” Considering the Petro, SOV and Bitcoin, these cryptocurrencies were developed with the intention of conducting transactions as well as operating in the manner as traditional money (that is fiat currency or coins and bank notes). Bitcoin can be used to purchase goods and services, however, there is currently no law regulating such transactions. The definition of ‘consumer’ in the ECT Act can be extended to encompass a consumer transacting with bitcoins or another cryptocurrency. A natural person will initiate the transaction with the supplier of goods or services, the nodes will verify the transaction and the supplier will receive the payment electronically.

Section 1 of the ECT Act defines a “cryptography product” as well. It is defined as follows:

“Cryptography product means any product that makes use of cryptographic techniques and is used by a sender or recipient of data messages for the purpose of ensuring-

- (a) that such data can be accessed only by relevant persons;
- (b) the authenticity of the data;
- (c) the integrity of the data; or
- (d) that the source of the data can be correctly ascertained”

The Bitcoin network can be said to be a cryptography product. This definition can be extended to include cryptocurrency networks as well as transactions are conducted on these networks. Cryptocurrency networks utilize cryptography, as discussed in chapter 2 and chapter 4 of this dissertation. The blockchain can be accessed by anyone as it is a public ledger²⁸⁷ however, the

²⁸⁶ Electronic Communications and Transactions Act 25 of 2002.

²⁸⁷ D Genkin, D Papadopoulos and C Papamanthu ‘Privacy in Decentralized Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 80.

transaction can only be verified and added to the blockchain by the miners.²⁸⁸ The data or transaction on the blockchain cannot be tampered with or altered as the transaction, once stored in a block, becomes permanent.²⁸⁹

Section 12 of the ECT Act refers to transactions that are in writing which is as follow:

“A requirement in law that a document or information must be in writing is met if the document or information is-

- (a) in the form of a data message; and
- (b) accessible in a manner usable for subsequent reference.”²⁹⁰

If analysing this provision, information stored on the blockchain can be retrieved and used for “subsequent reference.”²⁹¹ Chapter 2, sub-heading 2.3.1 of this dissertation analyses blockchain technology. The blockchain is a public ledger which means that transactions occurring on the blockchain will be made available,²⁹² hence the information can be accessible for later use.

Section 14 of the ECT Act refers to originality of the data message. The provision is as follows,

“(1) where a law requires information to be presented or retained in its original form, that requirement is met by a data message if-

- (a) the integrity of the information from the time when it was first generated in its final form as a data message or otherwise has passed assessment in terms of subsection (2); and
- (b) that information is capable of being displayed or portrayed to the person whom it is to be presented.”²⁹³

²⁸⁸ NP Dlamini, MS Scott, KK Nair ‘A Bitcoin Framework: An Alternative Payment System for Rural Areas of South Africa Using Low-End Mobile Phones’ (2016) *SATNAC*.

²⁸⁹ M Iansiti and KR Lakhani ‘The Truth about Blockchain’ (2017) *Harvard Business Review* 4. Available at: https://enterpriseproject.com/sites/default/files/the_truth_about_blockchain.pdf.

²⁹⁰ Electronic Communications and Transactions Act 25 of 2002, section 12.

²⁹¹ Electronic Communications and Transactions Act 25 of 2002, section 12.

²⁹² Blockchain 101 for Governments’ (2017) WU Global Tax Policy Center 3. Available at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

²⁹³ Electronic Communications and Transactions Act 25 of 2002, section 14(1)(a)-(b).

When analysing this provision and regarding section 14(2)²⁹⁴ the information on the blockchain cannot be altered as the information stored is complete and permanent.²⁹⁵ Therefore, the integrity of the information is found to be in its final form.

Whilst application of the ECT Act to transactions occurring on cryptocurrency networks and on the blockchain will be advantageous, it can be suggested that the wording of the Act be extended to introduce cryptocurrency transaction. On the contrary, if the Act is extended to include cryptocurrency transactions, this will be a form of regulation to a currently unregulated industry which can have a negative impact.

5.7 Impact of Creating a Sovereign Cryptocurrency based on Venezuela's Model

5.7.1 The Mining Sector

Venezuela created and introduced a sovereign cryptocurrency which is backed by the oil reserves of the country.²⁹⁶ Each Petro is backed by a barrel of oil.²⁹⁷ This is made possible as the oil industry of Venezuela is nationalised by the state. If South Africa is analysed in such a case, the country has an array of natural resources available such as gold, diamonds, platinum and coal.²⁹⁸ The difference between Venezuela and South Africa is the concept of nationalisation. South Africa has not nationalised the mining sector of the country. It has been argued that nationalising the mines would not make a difference socially.²⁹⁹

Taking the issue of foreign investment, a developing country such as South Africa relies on foreign investment as such investment stimulates the economic growth of the country and

²⁹⁴ Electronic Communications and Transactions Act 25 of 2002, section 14(2).

“(2) For the purposes of subsection 1(a), the integrity must be assessed-

(a) by considering whether the information has remained complete and unaltered, except for the addition of any endorsement and any change which arises in the normal course of communication, storage and display;

(b) in the light of the purpose for which the information was generated; and

(c) having regard to all other relevant circumstances.”

²⁹⁵ M Iansiti and KR Lakhani ‘The Truth about Blockchain’ (2017) *Harvard Business Review* 4. Available at: https://enterprisersproject.com/sites/default/files/the_truth_about_blockchain.pdf.

²⁹⁶ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁹⁷ Venezuelan Financial and Technology Proposal ‘Whitepaper: Petro’ (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

²⁹⁸ Minerals Council South Africa. <https://www.mineralscouncil.org.za/sa-mining>. (Date Accessed: 02 April 2019).

²⁹⁹ S du Plessis ‘Nationalizing South African Mines: An Economic Assessment’ (2013) 113(1) *Journal of the Southern Institute of Mining and Metallurgy* 32.

brings in additional capital into the country.³⁰⁰ The mining sector contributed 6,8% of the GDP for 2017/2018.³⁰¹ If the South African government decide to nationalise this sector, they would be required to repay the investors their investment percentage which is currently not feasible.³⁰² In addition to the above, it has been stated that nationalising the mines in South Africa would increase the government's role in the country's economy and considering the results from other countries, this is not advisable as the results were not positive.³⁰³

5.7.2 Electricity

As seen in Chapter 2, cryptocurrency requires data mining on the network. One disadvantage of this is the large consumption of electricity.³⁰⁴ Data mining requires extensive computational power which requires large amounts of electricity. This would not be feasible in South Africa as South Africa is experiencing an electricity crisis.³⁰⁵ South Africa's electricity is supplied by Eskom, a state-owned enterprise who has monopoly in the electricity industry. The country experiences frequent power cuts which negatively impacts many businesses as well as mobile network services.³⁰⁶ The uncertainty of electricity could negatively impact the adoption of a sovereign cryptocurrency. Creating a sovereign cryptocurrency would require large amounts of electricity.

5.7.3 Other Factors to Consider

Venezuela appointed a Superintendent of Cryptocurrency and as Marc Chandler argues, the appointed person would have to possess extensive knowledge of cryptocurrencies.³⁰⁷

³⁰⁰ S du Plessis 'Nationalizing South African Mines: An Economic Assessment' (2013) 113(1) *Journal of the Southern Institute of Mining and Metallurgy* 37.

³⁰¹ Minerals Council South Africa 'Facts and Figures 2017' (2018) Available at: <https://www.mineralscouncil.org.za/industry-news/publications/facts-and-figures>. Date Accessed: 02 April 2019.

³⁰² S du Plessis 'Nationalizing South African Mines: An Economic Assessment' (2013) 113(1) *Journal of the Southern Institute of Mining and Metallurgy* 32.

³⁰³ S du Plessis 'Nationalizing South African Mines: An Economic Assessment' (2013) 113(1) *Journal of the Southern Institute of Mining and Metallurgy* 32.

³⁰⁴ L Kugler 'Why Cryptocurrencies Use So Much Energy- And What to do About it' (2018) 61(7) *Communications of the ACM* 15.

³⁰⁵ Eskom In Urgent Talks with Petro SA To Speed Up Delivery of Critical Diesel Shipment Fin24 (20 March 2019) Available at: <https://www.fin24.com/Economy/eskom-in-urgent-talks-with-petro-sa-to-speed-up-delivery-of-critical-diesel-shipment-20190320-2>. Date Accessed: 03 April 2019.

³⁰⁶ Eskom In Urgent Talks with Petro SA To Speed Up Delivery of Critical Diesel Shipment Fin24 (20 March 2019) Available at: <https://www.fin24.com/Economy/eskom-in-urgent-talks-with-petro-sa-to-speed-up-delivery-of-critical-diesel-shipment-20190320-2>. Date Accessed: 03 April 2019.

³⁰⁷ M Chandler 'Venezuela's Cryptocurrency is a Desperate Gimmick' (2018) <http://www.marctomarket.com/2018/02/venezuelas-cryptocurrency-is-desperate.html?q=Venezuela%27s>. Date Accessed: 21 August 2018.

If the sovereign cryptocurrency is linked to the Rand, as the Bolivar is linked to Petro, it would not make any difference to the South African economy. The South Africa Rand (ZAR) is weak against the USD, Euro and Pound. Therefore, as the Petro has been analysed, there is no indication as to how the Petro would be separate from the Bolivar or how the Petro would strengthen the Bolivar.

5.7 Conclusion

Developing a sovereign cryptocurrency for South Africa or another developing country will have widespread consequences for the relevant country. Although the RMI have developed a sovereign cryptocurrency, the success of this is yet to be determined. Designing and creating a sovereign cryptocurrency requires extensive research. As seen above, the SARB is attempting to gain enough exposure to cryptocurrencies and blockchain technology before taking further steps. Although the SARB is gaining exposure, they are nevertheless still hesitant with the technology. Furthermore, the numerous risks associated with cryptocurrencies, as discussed in chapter 3, play a vital role in the adoption of a sovereign cryptocurrency.

The following chapter will provide a conclusion for this research and in addition, recommendations will be provided based on the information gathered in this research paper.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This dissertation sought to analyse the Venezuelan sovereign based cryptocurrency and the impact that such a development would have on another developing country such as South Africa. Furthermore, this dissertation sought to discuss the reason behind the invention of cryptocurrencies as well as to examine if there are any benefits as well as other uses from using blockchain technology. Due to the lack of research on sovereign cryptocurrencies and Petro, various documents were used to supplement this research paper such as academic journals, newspaper articles, websites and whitepapers issued by various institutions. This chapter seeks to provide a brief summary of the key points discussed in each chapter as well as provide recommendations at the end.

Cryptocurrency, or more specifically Bitcoin, was developed as a reaction to the 2008 financial crisis, as discussed in chapter 2.³⁰⁸ The banking industry in America failed and many banks had declared bankruptcy,³⁰⁹ which led to a global crisis.³¹⁰ Satoshi Nakamoto developed Bitcoin to exclude the presence of a third party.³¹¹ This was done due to the failure of the banks who acted as a third party in transactions. Bitcoin is developed by using blockchain technology. Blockchain is a public ledger that verifies and records transactions.³¹² Although blockchain has gained immense popularity in the cryptocurrency realm, it however, has the potential to be used in various industries. As discussed in chapter 2, blockchain can assist with electronic voting,³¹³ as well as with public administration.³¹⁴

³⁰⁸ K Mitchell 'Bitcoin from The Beginning' (2014) 14(2) *Without Prejudice* 60.

³⁰⁹ CD Romer and RH Pells 'Great Depression. (2018) *Encyclopaedia Britannica, Inc.* <https://www.britannica.com/event/Great-Depression> (Date Accessed: 14 June 2018).

³¹⁰ CD Romer and RH Pells 'Great Depression. (2018) *Encyclopaedia Britannica, Inc.* <https://www.britannica.com/event/Great-Depression> (Date Accessed: 14 June 2018).

³¹¹ N Weaver 'Risks of Cryptocurrencies' (2018) 61(6) *Communications of the ACM* 21.

³¹² M Iansiti and KR Lakhani 'The Truth about Blockchain' (2017) *Harvard Business Review* 4. Available at: https://enterpriseproject.com/sites/default/files/the_truth_about_blockchain.pdf.

³¹³ 'Blockchain 101 for Governments' (2017) WU Global Tax Policy Center. 6. Available at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

³¹⁴ 'Blockchain 101 for Governments' (2017) WU Global Tax Policy Center. 7. Available at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

Although there are merits to the creation of cryptocurrencies, there are numerous risks as well. Chapter 3 discussed various benefits as well as the risks associated with cryptocurrencies. These risks are categorized under technical risks, economic risks, systemic risks and societal risks.³¹⁵ Money laundering is the main risks that affects cryptocurrency networks as the main feature of anonymity makes it easier for money laundering.³¹⁶ Anonymity makes it more difficult to trace the user.³¹⁷ When analysing South Africa, section 28 of FICA makes provision for the reporting of transactions where the transaction is above the prescribed limit.³¹⁸ Another risk that is present is the price volatility of cryptocurrencies which fluctuates on a daily basis.³¹⁹ Theft and fraud is another major issue. Theft can occur when one hack's another's computer and steals the digital wallet containing cryptocurrency.³²⁰ Furthermore, should a user forget their password for the system, there is no mechanism in place to allow the user to obtain a new password.³²¹ Consumers are also at risk when transacting with cryptocurrencies. The SARB notes that if there is any error the consumer has no right of recourse.³²²

In the case of *US v Ulbricht*, also known as the Silk Road case, Ulbricht was charged with “participation in a narcotics trafficking conspiracy, a continuing criminal enterprise, a computer hacking conspiracy and a money laundering conspiracy.”³²³ It was alleged that these crimes were made possible through the use of Bitcoin.³²⁴ This case importantly notes that the court states that the anonymity behind Bitcoin transactions are not unlawful, however, the type of transaction that one engages in is important.³²⁵

³¹⁵ N Weaver ‘Risks of Cryptocurrencies’ (2018) 61(6) *Communications of the ACM* 20.

³¹⁶ D Bryans ‘Bitcoin and Money Laundering: Mining for an Effective Solution’ (2014) 89 *Indiana Law Journal* 447.

³¹⁷ D Bryans ‘Bitcoin and Money Laundering: Mining for an Effective Solution’ (2014) 89 *Indiana Law Journal* 447.

³¹⁸ Financial Intelligence Centre Act 38 of 2001.

³¹⁹ United Nations ESCAP ‘Digital and Virtual Currencies for Sustainable Development’ (2017).5. Available at <https://www.unescap.org/resources/digital-and-virtual-currencies-sustainable-development>. Date Accessed: 12 June 2018.

³²⁰ JB Turpin ‘Bitcoin: The Economic Case for a Global, Virtual Currency Operating in an Unexplored Legal Framework’ (2014) 21(1) *Indiana Journal of Global Legal Studies* 345.

³²¹ EBA Opinion on ‘Virtual Currencies’ (2014) 28. Available at: <https://eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf>. Date Accessed: 15 March 2018.

³²² South African Reserve Bank ‘Position Paper on Virtual Currencies’ (2014) 10. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

³²³ *US v. Ulbricht*, 31 F. Supp. 3d 546.

³²⁴ *US v. Ulbricht*, 31 F. Supp. 3d 540.

³²⁵ *US v. Ulbricht*, 31 F. Supp. 3d 569.

The Venezuelan government developed and launched a sovereign based cryptocurrency called Petro. As seen from chapter 4, Venezuela was once a wealthy country, however, they are now facing a financial crisis.³²⁶ Venezuela has an abundance of oil hence the Petro is backed by the oil reserves of the country.³²⁷ The government created Petro to help ease the financial crisis experienced by the country.³²⁸ Upon analysis of the Petro it was clear that the government had not researched enough before launching such an invention. The government made provision for a Superintendent of Cryptocurrency, however, the error made was appointing someone who has insufficient knowledge about cryptocurrencies.³²⁹ Furthermore, the government asserts that the Petro will be different than the mainstream cryptocurrencies, however, there is no evidence that shows how Petro will be different. Chapter 4 stated that Petro defeats the purpose of cryptocurrencies are cryptocurrencies are created to be independent of the government.

Various countries are experiencing financial crises and are looking for alternate ways of improving the economy. Chapter 5 analysed the impact of introducing a sovereign based cryptocurrency in a developing country by looking at South Africa. This chapter briefly analysed the DISCA as introduced by the RMI as well as briefly analysed the paper issued by the Australian Government Treasury. If introducing a sovereign based cryptocurrency, it would need to be issued by the SARB, as the SARB has the sole right to issue currency in South Africa.³³⁰ Furthermore, in 2014, the SARB released a position paper on virtual currencies which addressed the bank's position regarding cryptocurrencies. The paper addressed various risks related to cryptocurrencies and it was noted that cryptocurrencies can negatively affect the financial system of the country.³³¹

There are various factors that affect South Africa's ability from adopting a sovereign cryptocurrency. One such factor is the issue of the mines. The mines in South Africa are not

³²⁶ P Smith 'Venezuela in Crisis: With its economy in free fall and a government looking more and more like a dictatorship, Venezuela is on the brink of disaster' (2017); 149(13); *New York Times Upfront*; 13. Available at: <http://search.ebscohost.com.ukzn.idm.oclc.org/login.aspx?direct=true&db=f5h&AN=123067627&site=ehost-live>. Date Accessed: 2 March 2019.

³²⁷ Venezuelan Financial and Technology Proposal 'Whitepaper: Petro' (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

³²⁸ Venezuelan Financial and Technology Proposal 'Whitepaper: Petro' (2018) 3. Available at: <http://www.elpetro.gob.ve/index-en.html>. Date Accessed: 6 April 2018.

³²⁹ M Chandler 'Venezuela's Cryptocurrency is a Desperate Gimmick' (2018) <http://www.marctomarket.com/2018/02/venezuelas-cryptocurrency-is-desperate.html?q=Venezuela%27s>. Date Accessed: 21 August 2018.

³³⁰ South African Reserve Bank Act 90 of 1989, Section 14(1).

³³¹ South African Reserve Bank 'Position Paper on Virtual Currencies' (2014) 5. Available at: [https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem\(NPS\)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf](https://www.resbank.co.za/RegulationAndSupervision/NationalPaymentSystem(NPS)/Legal/Documents/Position%20Paper/Virtual%20Currencies%20Position%20Paper%20%20Final_02of2014.pdf). Date Accessed: 15 March 2018.

nationalised unlike the oil industry in Venezuela. Should the government decide to nationalise this sector, they would be required to repay the investors, which is not feasible.³³² In addition to the mining issue, South Africa is experiencing an electricity crisis. Cryptocurrency mining requires large amounts of electricity³³³ to which South Africa is currently in lack of. Chapter 5 concluded that, after taking into consideration the factors pertaining to South Africa, it would not be feasible to develop a sovereign based cryptocurrency.

6.2 Recommendations

In light of the research obtained, the followed recommendations are put forward:

- It is proposed that considering the pitfalls related to the Petro, developing countries such as South Africa should not create and implement a sovereign or national cryptocurrency. There are numerous risks associated with cryptocurrencies that could have a disastrous impact on the country and the economy of the respective country.
- Considering the various uses for blockchain technology, this technology should be implemented in the applicable institutions.
- Blockchain technology can be used in the voting processes to ensure that there is transparency in the process.³³⁴ It can reduce corruption regarding the votes as the records on the blockchain are permanent.
- The blockchain can assist government institutions with keeping of records such as land titles, citizen and resident's information.³³⁵ This would allow for a faster service delivery on part of the respective institutions side. Furthermore, there would be a reduced chance of such information getting lost as records are permanent³³⁶ and is quite difficult to remove or tamper with. However, the relevant persons must be well equipped with such technology to avoid errors with the information that needs to be placed on the blockchain.

³³² S du Plessis 'Nationalizing South African Mines: An Economic Assessment' (2013) 113(1) *Journal of the Southern Institute of Mining and Metallurgy* 32.

³³³ L Kugler 'Why Cryptocurrencies Use So Much Energy- And What to do About it' (2018) 61(7) *Communications of the ACM* 15.

³³⁴ 'Blockchain 101 for Governments' (2017) WU Global Tax Policy Center.6. Available at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

³³⁵ 'Blockchain 101 for Governments' (2017) WU Global Tax Policy Center.7. Available at http://www.un.org/esa/ffd/wp-content/uploads/2017/10/15STM_Blockchain-101.pdf. Date Accessed: 6 July 2018.

³³⁶ M Iansiti and KR Lakhani 'The Truth about Blockchain' (2017) *Harvard Business Review* 4. Available at: https://enterpriseproject.com/sites/default/files/the_truth_about_blockchain.pdf.

- As seen in chapter 5, the SARB experimented with DLTs by creating a tokenised version of the South African rand.³³⁷ It is proposed that the SARB should research the area more as it can prove to be useful in the economic activity of the country. If such an idea is implemented, it would reduce bank charges for users when transacting with another bank (interbank transactions). This would allow individuals from various income groups to participate in the banking industry as the transaction costs would be much lower. Furthermore, the waiting period for the confirmation of transactions would be reduced substantially, thus allowing for transactions to occur efficiently.
- Allowing the SARB and banks to control the blockchain would be safer for consumers as such a system would be regulated by the SARB, thus affording consumers a right of recourse in the event that there is irregularity on part of the system. This would protect the consumers unlike that of traditional cryptocurrencies and possibly the Petro.

Cryptocurrencies are complex and require much education before deciding to create and implement a sovereign cryptocurrency. The lack of knowledge on part of the Venezuelan government might lead to the downfall of the Petro. As seen from the research blockchain has immense uses which should be considered by the relevant stakeholders and institutions. Accordingly, before other developing countries implement such a creation, these countries should experiment with the technology first to assess the advantages and disadvantages of such a technology.

³³⁷ South African Reserve Bank, "Project Khokha—Exploring the use of distributed ledger technology for interbank payments settlement in South Africa." (2018). 6. Available at: https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/8491/SARB_ProjectKhokha%2020180605.pdf . Date Accessed: 9 September 2018.

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3 September 2018

Miss Jenelle Shenice Moodley 214504434
School of Law
Howard College Campus

Dear Miss Moodley

Protocol reference number: HSS/1365/018M

Project title: An examination of blockchain technology and Venezuela's sovereign-based cryptocurrency including the effects of implementing a sovereign-based cryptocurrency in developing countries

FULL APPROVAL – No Risk/Exemption Application

In response to your application received 2 August 2018, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Professor Shenuka Singh (Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

cc Supervisor: Deverasi Bellengere
cc. Academic Leader Research: Dr Shannon Bosch
cc. School Administrator: Ms Robynne Louw

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