Introducing a Cryptocurrency backed by African States: Cause and Effect

James Odero
1568241

A research article submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2018
DECLARATION

I, James Odero, declare that this research article is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

(James Midenga Odero)

Signed at Sunning Hill, Johannesburg

On the 27th day of February 2018
DEDICATION

This work is dedicated to my daughters, Mia and Terry Midenga. I pray that this leads to you inheriting a better continent than the one handed to me. I love you my angels.
ACKNOWLEDGEMENTS

“Degree ni Harambee”, That’s what my brother Billy always says. It’s been a community effort, a tremendous journey of hope, sweat and a tear or two.

A sincere gratitude goes out to my Family, Mom, Dad, Billy, Dot, Laureen you’ve have been EPIC!! Special thanks also go out to Neesha Sewlall, your patience, fortitude and gracious spirit carried me through a big part of this journey. Your economics tutelage in first year really paid off. Thank you.

To my friends and colleagues at the Pan African Parliament, I wouldn’t have been able to do this without you.

To my supervisor and white knight, Neo Moloele. Thank you for coming to my rescue.

Finally, to the inventors, innovators and creators;

“May you keep asking why? Of the Universe and let nothing stand between the answer and your mind” – Andy Rand
SUPPLEMENTARY INFORMATION

Nominated journal: Journal of International Money and Finance

Supervisor / Co-author: Neo Moloele

Word count †: 15194

Supplementary files: Schedule of interview questions

† Including abstract references, etc.
ABSTRACT

This paper theorised an African cryptocurrency termed Afro-Pesa that is backed by gold and supported by African States. The cryptocurrency was envisaged to operate on an Ethereum like, open source public blockchain network and replace the US Dollar as the base currency for Intra-Africa trade. Qualitative research was used to interrogate the possible effects of introducing the hybrid monetary framework that includes the use of a continental cryptocurrency and government issued fiat currency. The paper demonstrated that launching Afro-Pesa would have some effect in improving economic growth, enhancing the stability of the African financial system, lowering transactional costs, lowering currency risk, improving currency liquidity, and improving intra-Africa trade. Indirect effects include increased political integration and a low level of convergence of various national business cycles in Africa. Essentially, this paper introduces a new hybrid exchange rate regime for African States aided by cryptoeconomics.

Keywords: Cryptocurrency, Blockchain, Bitcoin, Ethereum, Cryptoeconomics, Monetary Policy, Optimum currency Area, game theory, Intra-Africa trade, Exchange rate regime, financial volatility
1. INTRODUCTION

It is easier, faster, and cheaper to fly fiat currency from one African country to another than it is to transfer funds electronically across the continent. Illustratively, it takes an average of 5 business days to send funds from Ethiopia to Rwanda. The process is expensive, and highly inefficient as it entails converting Ethiopian Birrs to United States Dollars (USD), then transferring the USD to international clearing houses outside of Africa. This is followed by the transfer of the USD back to Rwanda where it is converted to Rwandan Francs (Fexco, 2017). Each intermediary in the process leverages a transaction fee resulting in a cumulative cost of around 12 percent of the amount sent - the reported average for intra-Africa funds transfer (Dahir, 2017).

In instances where one chooses to physically transport the fiat currency of an African country, say Gambian dalasi, to another country, say Somali, they run the risk of not finding users who will accept said currency as legal tender. This is attributable to low levels of trust in African currencies stemming from their high currency volatility, exchange rate fluctuation, high inflation rates, and low levels of intra-Africa trade (Anyanzwa, 2017). Consequently, the USD has become the proverbial currency for cross border transactions in Africa (Mwai, 2016). However, the use of the USD poses substantial challenges for African states ranging from liquidity constraints, such as those witnessed in Nigeria in 2017, to the lack of prudential monetary control.

In addition, many African nations exhibit a chronic inability to forge stable domestic monetary systems, in which promises to pay are produced in a settlement with major economic interests (Pettifor, 2011). Fiscal and monetary policy challenges are severe on the continent, and the credibility of financial institutions is fragile, especially in the wake of Africa’s numerous domestic conflicts, political instability, corruption and state mismanagement, which has led to poor sovereign ratings and low levels of investment (Masson & Pattillo, 2002).

Furthermore, transactional costs relating to intra-Africa trade are remarkably higher than those registered in trade with external parties, thereby curtailing the continents ability to trade with itself (Gonzalez, 2015). In 2014 for example,
Europe exported 69% of its products to other European countries, Asia exported 52% to Asia markets and North America exported 50%. Africa had the lowest level of intra-regional trade, at just 18% (Musiitwa, 2016).

Another challenge facing the continent is the concerted lack of trust in Africa’s financial and governance architecture by most economic actors within an environment where trust is of critical importance (Luebke, 2016). Trust plays a central role in encouraging cooperation by reducing uncertainty and minimising the costs of limited information and should therefore be considered as a determinant of economic growth (Schmidt 2003).

Africa also suffers from poor infrastructure which has alienated rural communities and led to high urbanization as citizens seek ways to become economically productive. This is evidenced by the high number of Africans who are unbanked and the poor levels of development among communities in the outskirts of various countries such as the rural communities found at the border of Burkina Faso and Cote d’Ivoire (Knowles, 2016).

The convergence of the above challenges is a continent grappling with high currency instability, tremendous financial risk, high exchange rate fluctuations, high rates of inflation and low levels of trade within a much more constrained market than available.

This paper introduces a cryptocurrency termed Afro-Pesa - designed primarily for intra-Africa cross border transactions but with capabilities for broader application. The paper then makes use of qualitative research techniques to interrogate the importance of introducing the cryptocurrency and its broader effects.

1.1 Problem statement

The launch of Bitcoin in 2009 and subsequent creation of start-ups such as BitPesa, Luno, WorldRemitt and Humaniq have introduced a new secure and transparent way of exchanging value across national boundaries that do not rely on trusted third-party intermediaries such as central clearing houses. The challenge for African authorities is that, the mainstream adoption of crypto-
currencies in their current format is an endorsement of a financial ecosystem that
rejects any kind of centralized economic exchange.

The research seeks to answers the following questions:

**Primary Question**
- Would the introduction of an African cryptocurrency lead to economic
growth and the stabilization of the financial ecosystem on the continent?

**Secondary Questions**
- Can a single African cryptocurrency lead to the reduction of transactional
costs, reduction in currency risks, increase intra-Africa trade, increase
liquidity in the economy and cause the convergence the continent’s various
independent business cycles?
- What other effects would the introduction of the cryptocurrency have on the
continent?

1.2 **Assumptions of the study**

The research will focus primarily on the macro-economic aspects of the research
problem. It is hinged on the assumptions that; (1) It is technically possible to roll
out Afro-Pesa across the continent, (2) agile execution framework will be
adopted, (3) There is broad political and socio-economic support for the solution,
and (4) There is global adoption of Afro-Pesa across the continent.

1.3 **Background**
1.3.1 **The rise of the Bitcoin cryptocurrency**

Bitcoin was introduced in 2009 by an anonymous person or group of persons
under the alias of Satoshi Nakamoto and has eliminated the need for trusted third
parties in overseeing the electronic transfer of value. It is a geographically
dispersed, opensource, decentralised public ledger that behaves like money but
is not issued by a central entity such as a Reserve bank. It rather relies on a
network of “miners” to contribute their computing power towards solving
cryptographic mathematical problems that verify transactions on the blockchain network in exchange for Bitcoin rewards (Peters, Panayi, & Chapelle, 2015).

The issuance of rewards on the network increases the number of Bitcoins in circulation, effectively providing for the networks monetary policy. A hard cap of all Bitcoins that will ever be issued has been set at 21 million Bitcoins, with the last coin being mined in 2140, thereby causing the cryptocurrency to behave like fiat currency under the gold standard (Weber, 2015). Bitcoin can be used broadly to purchase goods and services anywhere in the world provided that the transacting parties accept it as a form of payment.

Transactions on the block chain are recorded in a public ledger but are semi-anonymous because they only reflect the transacting users’ wallet identification numbers (Swami, 2017). However, the protocol’s design includes elements that could facilitate the tracing of funds, including publication on the block chain - providing permanent publicly available records of what funds were moved and where (Böhme, Christin, Edelman, & Moore, 2015). Bitcoins electronic form means that it can be transferred easily anywhere in the globe at minimal cost making it ideal for international payments and cross border remittances.

Bitcoin has enabled effective competition between digital cryptocurrencies and traditional legal tender fiat currencies (Ametrano, 2016). However, from an economic theory perspective, the virtual currency does not fully align with the three functional prescripts of money, namely; medium of exchange, unit of account and a store of value (Lo & Wang, 2014).

While many merchants accept payment in Bitcoin, there hasn’t been a high volume transactional usage of the digital currency by the broader public (Katz, 2017). Instead the cryptocurrency has drawn substantial uptake from users who acquire it for speculative investment rather than for transactional reasons (Cheng E., 2017). This may be attributed to Bitcoins high price volatility and the slow pace of execution of transactions on the block chain which can take up to ten minutes to verify, making it an inefficient means of in-person retail payments (D’Aliessi, 2016).
Additionally, Bitcoin is not backed by any government or commodity which means that its valuation is driven purely by market demand and supply forces informed by varying perceptions of the intrinsic value of the cryptocurrency as a store of value and a method of value transfer (Barker, 2017).

1.3.2 A model of an African cryptocurrency

Bitcoin has spawned various blockchain related solutions that have been designed to improve on its functional capabilities while eliminating its shortcomings. An example is Ethereum, a decentralized platform that runs on an enormously powerful, custom built, shared global blockchain infrastructure with capabilities of embedding self-executing smart contracts in transactions (Ethereum, n.d.). Unlike Bitcoin, Ethereum is not a cryptocurrency, even though it has its own currency called the Ether, but is rather a platform upon which varied blockchain related applications may be built. Another noteworthy solution based on blockchain technology is Onegram – the world’s first completely gold backed digital currency in which each digital token represents a gram of gold and is redeemable (Aitken, 2017).

This paper borrows from the afore-mentioned innovations in Bitcoin, Ethereum and Onegram in presenting a cryptocurrency that spans the entire African continent. The currency is referred to as Afro-Pesa, a word derived from short hand of Africa – Afro, and the Swahili term for money – Pesa.

Afro-Pesa is envisioned as a cryptocurrency built on a decentralized, cloud based, blockchain network similar to Ethereum, with embedded smart contracts for tax collection at point of transaction. The currency is backed by a gold reserve amounting to a minimum of ten percent of the gross domestic product of each African country at point of launch. Each African country contributes said gold reserve and agrees to the free capital flow of Afro-Pesa within the continent.

External flows out of the continent are governed by the embedded smart contracts. Each Afro-Pesa coin (APC) is backed by one gram of gold at launch. Like OneGram, each transaction of an APC generates a small transaction fee
which is reinvested in more gold (net of admin costs), thus increasing the amount of gold that backs each APC. Therefore, Afro-Pesa increases in value over time.

The value of Afro-Pesa is pegged to the spot price of gold, and each African country maintains its own domestic monetary policy with the exception of national gold reserves held in the cryptocurrency framework. Afro-Pesa is governed by a central committee of African Central banks which ensure that there is a vibrant eco-system of merchant application and payment processing services. Any Afro-Pesa user can withdraw the value of their coin in gold at will.
2. LITERATURE REVIEW

2.1 Introduction

There have been a lot of discussions by policy makers at the African Union about
the introduction of a single currency in Africa (Masson & Pattillo, 2002). The
discourse has centered around the benefits that a single currency would bring to
a highly fragmented continent especially in areas of economic and political
integration. Benefits which according to Backe (1999) include;

- Reduction of transactional costs between member countries owing to the
termination of currency exchange transactions and hedging costs
- Lower costs of financial services due to increased competition within the
financial sector
- Positive effects resulting from stable exchange rates, though paired with
substantial initial adjustment costs for countries with weaker currencies
- Dynamic growth effects resulting from a more efficient allocation of capital
due to disappearing transaction costs and increased accumulation of real
capital attributable to falling yields on financial capital.

Kazimoto, 2014; Saka, Onafowokan, & Adebayo (2015) expand on these benefits
to include reduction of financial risks, enhancement of price transparency,
reduction of inflation, promotion of trade and creation of a larger market; all of
which would lead to deeper economic, cultural and socio-political cooperation
within the continent.

The assessment of these economic consequences as pertains to a single digital
currency in Africa is complicated by the lack of historic precedents. However, one
may draw on some lessons from the adoption of a single currency by the
European Monetary Union to aid in the analysis. This is because the Euro
presents the closest antecedent to a continental currency. While partially
befitting, such an assessment is complicated by divergence in levels of economic
and regulatory convergence, development and similarities between the countries
in Africa and those in Europe (Al Ubaydli, 2016). Furthermore, economic costs
and benefits attributed to a single digital currency cannot be offset easily against
each other as they are partly Macro-economic and partly Micro-economic in
nature. Additionally, the effects from some of the factors at play can only be gleamed in the long run and others in the short run.

In exploring the possible effects of introducing an African cryptocurrency backed by gold and supported by African States, this chapter analyses Keynesian and Post Keynesian theories explaining economic growth and stability. It also evaluates and critiques Robert Mundell’s 1961 theory of Optimum currency areas and offers a rational for a hybrid monetary policy framework. It further assesses the theoretical underpinnings of economic incentives in Vitalik Butarin’s cryptoeconomics.

2.2 Economic growth and stability

In the contemporary global environment of free capital flows, nations are faced with an increasing impulsion to select appropriate monetary policies geared towards responding to different types of shocks that may affect the economy (Ivanović & Stanišić, 2017). These monetary policy responses are generally balanced out against fiscal policy responses. The aim of which includes the sustenance of high national economic growth characterized by low levels of unemployment, increase in income and a rise in the rate of consumption.

These growth policy decisions sit well within the development frame for the attainment of the Keynesian macroeconomic equilibrium discussed in “the general theory of employment, interest and money” by John Maynard Keynes (1936) as explained by (Ferguson, 2013). In his work, Keynes sort to explain changes in economic output by assessing fluctuations in national income, savings, investments and consumption. He demonstrated that rising unemployment, decrease in income, and a reduction in consumption, investment and savings were all symptoms of a recession when they occur in unison.

Keynes argued that in times of recession, governments should intervene to raise aggregate demand by either increasing government spending through fiscal policy or reducing interest rates through monetary policy. The latter is generally done through supply side aggregates by increasing the money supply in the
economy. This in turn affects the valuation of the national currency as well as the rate of investment in the economy.

The depreciation of a national currency has the effect of increasing net exports thereby stimulating aggregate demand for goods produced domestically. Conversely, the appreciation of a currency reduces aggregate demand leading to a reduction in general prices of goods and a cooling of the economy which curbs the rate of inflation (Cecchetti, Schoenholtz, & Fackler, 2011). Indeed, inflation targeting has become an essential element of flexible exchange monetary policy as it gives better output stabilization than fixed rates when demand shocks occur (Røisland & Torvik, 2004).

To this effect, the control of the supply of money and government’s ability to intervene in manipulating economic outcomes form an essential element for sustaining growth in contemporary economies. However, when a sovereign nation joins a monetary union they forego their ability to respond independently to unique disturbances in local economies (Stiglitz, 2016). African countries would therefore face substantial risk and incur great costs if they adopt a single currency because all monetary policy would be set externally by a central bank controlled by the collective. The costs would be further exacerbated by the large variance in the level of development in African countries.

Chari, Dovis, & Kehoe (2013) observe that this traditional understanding implicitly assumes that countries joining a currency union have no credibility problems. They argue that when countries face substantial credibility problems, the loss of monetary independence can be a major benefit of joining a monetary union. This is because the introduction of a fixed exchange rate of a single currency can anchor the monetary policy of a monetary union thereby enhancing the level of transparency and credibility. Based on their research findings, they offer that benefits such as lower rate of inflation can increase with the variability of country-specific shocks which may lead to the preference of a monetary union over flexible exchange rates.

The Keynesian approach places great value on the effects of investment and views it as a critical factor of economic growth. This is because investments
increase income through the multiplier effect, thereby accelerating the rate of economic growth. However, Keynes focus was primarily on short term effects of economies in a depressive state and completely ignored effects in the long run. It therefore fails to adequately deal with the slower price adjustments across different jurisdiction in monetary unions which endure lengthier adjustments to the mismatch of supply and demand (Blanchard, 2011).

Evsy Domar and Roy Harrod expanded the reach of the Keynesian explanation to offset shortcomings in the analysis of effects in the long-run through the post-Keynesian theory. Their studies though independent showed that the rate of growth in a country depends on the level of investment (Todaro & Smith, 2009).

According to Harrod (1939), actual growth rate is determined by the growth rate of capital productivity and labour. In his assessment the economy will have continuous sustained development if the actual growth rate is matched with the full utilization of all capital resources in the economy. Domar (1947) on the other hand, views investment as a factor of both income and production capabilities. His theory determines pace at which investment grow in order to ensure growth in revenue. Accordingly, found that tempo of investment is dependent on a country’s marginal propensity to save and the efficiency of investments.

Together, Harrod and Domar’s theories can be combined to conclude that, in the technical conditions of production, economic growth is determined by the marginal propensity to save, and the dynamic equilibrium in the market system is inherently unstable, so that maintaining it at full employment requires active and purposeful actions of the state (Sharipov, 2015).

The theories may be criticised for arguing that the relationship between growth and investment is purely linear, doesn’t depend on the growth in labour or factor in the effect of technological progress in production (Hussein & Thirlwall, 2015). They none the less demonstrate the importance of attracting investments in local economies.

The Keynesian and Post-Keynesian theories are essential in helping us determine the rate of output in the economy as equalling the total sum of government spending G, consumption spending C, investment spending I and
net exports NX to determine the output of any economy. Net exports being the difference between a country’s imports and its exports (Van Rensburg, McConnell, & Brue, 2015).

Using this understanding, we can conclude that the net flow of household saving, plus foreign saving invested in a country, minus the government’s budget deficit would equal the amount of investment. By removing currency exchanges rate through the adoption of a single currency African countries would reduce the barriers for international investments and free capital flow movements.

Petursson (2000) in his assessment of the effects of fixed exchange rate regimes argues that they reduce transaction costs and exchange rate uncertainty in international trade by levelling out currency fluctuations which reduces uncertainty thereby stimulating trade. This in turn has a positive effect on the amount of net imports and rate of investment which feeds directly into the total output of the economy. He further argues that fixed exchange rate can serve as the anchor of monetary policy and increase its transparency as they rule out internal fluctuations among participating currencies. He further demonstrates that imperfect foreign exchange market can cause instability in the economy.

2.3 Optimum Currency Areas Theory

Robert Mundell’s (1961) Optimum Currency Area theory formed the theoretical basis for the creation of a single currency in Europe. It provided the economic rationale for countries to surrender their domestically-tailored monetary policies and exchange rate adjustment capabilities of their national currencies for externally controlled regional currency. Defining an optimum currency area (OCA) as a region with “internal factor mobility and external factor immobility”, Mundell (1961) demonstrated that choices between fixed and flexible exchange rates should not be made in a vacuum. He argued that certain characteristics of economies should be determinant factors when selecting appropriate exchange rate regimes. According to him, an OCA reflects a geography within which exchange rates are fixed, and where a single currency could be issued by a single central bank that controls monetary policy for the entire region (Harvey & Cushing, 2015). He moved on to argue that “if factors are mobile across national
boundaries, then a flexible exchange system becomes unnecessary and may even be positively harmful”.

Mundell (1961) recognized that there are situations where a flexible exchange rate is preferable to a fixed rate. Specifically, he stressed the influence of asymmetric shocks on the economy and elucidated the potential disadvantages that could arise from the elimination of exchange rates between participants in the union (Swoboda, 1999).

In follow up articles to Mundell’s work, McKinnon (1963) and Kenen (1969) elaborated on theoretical and empirical arguments for OCA theory. McKinnon (1963) focused his contributions on the practical need for stabilization policies given the possibility of some macro-economic shocks and the anticipated economic costs of adjustments through changes in wages, price levels and factor mobility which are sometimes in conflict. Additionally, he called for shared monetary and fiscal policy coupled with flexible external exchange rates in common currency areas.

He further called for the openness of the economies using a single currency and expanded the call for factor mobility beyond national boundaries to include decisive focus on industry. McKinnon (1963) argued that the converged management of monetary and fiscal policy, and flexible external exchange rates can be used to attain full employment, low inflation and achieve a favourable balance of payments in such a manner that the costs and benefits of sharing a common currency balance out.

Kenen (1969) on the other hand focused his examination on the issue of factor mobility. He advanced the argument that “when regions are defined by their activities, not geographically or politically, perfect interregional labour mobility requires perfect occupational mobility and this can only come about when labour is homogeneous” (Kenen, 1969). He argued that diversification of output (including exports) is an important criterion in the determination of OCA, maintaining that fixed exchange rates are most appropriate for well diversified economies, the reason being that diversification tends to average out the effect of external shocks, thus foretelling the need for frequent changes in exchange
rates (Ogrodnick, 2003). By implication, he therefore calls for less well diversified economies to rely more on flexible rates to insulate themselves from external shocks.

A summation of OCA criteria for the creation of a common currency aimed at negating regional economic shocks may therefore be argued to cover the following; labour mobility, capital mobility, economic openness, diversification in production and consumption, risk sharing, similarity in inflation rates, fiscal and political integration and business cycle homogeneity (Ogrodnick, 2003).

2.3.1 Critique of the optimum currency area theory

Mundell's OCA theory is couched in the assumption that central banks issue currency with the defined economic goals of controlling inflation and unemployment. It further assumes that central banks control the supply of money and operate within homogenous regions or geographies.

Beige (2017) questions the accuracy of the latter assumption and offers observations relating to the extension of the Euro currency area beyond the European nation state. He reinforces his assertion by offering that the US dollar is used officially and unofficially in many countries around the world that do not share similar economic productivity with the USA.

In fact, roughly 77% of the total 1.2 trillion USD in circulation in 2013 were hundred-dollar bills, of which two thirds were held outside the United States of America (Kemp, 2014). The USD is the official or unofficial currency of Zimbabwe, Liberia, Panama, Bolivia, Costa Rica, Cambodia, Argentina, Uruguay, Peru, Lebanon, Philippines, Myanmar, Guatemala and a host of other countries that have endured some form of monetary crisis in the past and share no economic resemblance to the USA.

Panama's dollarization in 1904 is particularly remarkable. The country's national currency, the Bolboa, is a unit of account that exists only as silver coins while the US dollar is the medium of exchange (Panama Economic Outlook, 2017). Additionally, Panama does not have a central bank but rather relies on a partially publicly owned commercial bank and a ‘national banking commission’ to work in
concert to; (1) supervise banking activities in the country; (2) provide banking to other banks; (3) offer broader commercial banking services to the public; (4) promote the country as an international financial hub; and (5) discharge government’s fiscal duties.

The country is home to many international banks and has free capital markets with almost no government intervention or restrictions on banking transactions, financial flows, or interest rates (Moreno-Villalaz, 1999). The absence of a central bank has created a completely market-driven money supply similar to the gold standard, in that the country must buy or obtain dollars by producing or exporting goods or services without recourse to money creation through monetary policy (Saied, 2007). According to The World Bank (2017), the country’s economy grew at an average rate of 7.2 percent between 2001 and 2013 with an average annual inflation of 2.8%.

In Panama, an environment of financial stability has fostered rapid growth of domestic deposits, while the combination of political security, liberal banking legislation, and economic prosperity has helped to establish the country as an important offshore banking centre (Collyns, 1999). Its monetary system epitomizes the operation of a competitive market macroeconomy and has shown salient economic stability with; an ability to handle large capital inflows, fluidity in adjusting to shocks without major disequilibria, comparatively low emerging market interest rates, sustained macroeconomic equilibrium, and a lack of distortions in macro-prices (Moreno-Villalaz, 1999).

Panama offers important lessons to emerging market economies on alternative monetary arrangements that are devoid of internal meddling through central banks. It further calls into question the premise underlying the OCA theory.

Another criticism of OCA has been forwarded by Schelkle (2016) who outright rejects the theory on the basis that no country or group of countries in the world represent an optimal currency area. She argues that countries are either too small such that the costs for currency transactions are high, or too big to the extent that a single currency is not ideal for all its internal regions.
She illustrates her assertion by explaining that under the arguments presented in OCA, large countries should have multiple currencies that support internal exchange rates: “for instance, the UK between Southern and Northern England or the US between California and Texas, as these economies are so different that they are hit by different shocks and are on different business cycles”.

In later re-iterations of the prescripts of optimal currency areas, Mundell (2012) swayed from his rigid elucidation of the required similarities between regions that would make up an ideal monetary union.

He argues that by analysing empirical evidence from the European Monetary Union (EMU) one finds great similarities between the nineteen countries that now make up the EMU. He continues by stating that the economic reality in Europe has generated the need for the inclusion of the remaining highly diversified 9-member countries of the EU into the EMU, thereby causing all members of the EU to use the Euro.

His contention is that, because the purpose of money is to provide convenience for trade, then the optimal currency area is "the world, regardless of the number of regions of which it is composed". He offers that his “ideal and equilibrium solution would be a world currency (but not a single world currency) in which each country would produce its own unit that exchanges at par with the world unit” that will be used solely for international trade purposes (Mundell R, The Works of Robert Mundell, n.d.).

Most digital currencies currently in circulation are borderless. They are primarily issued privately and are designed to reject the very notion of a central currency issuer, even though some central banks have launched sovereign digital currencies.

This borderless stateless predisposition might be good insofar as it can facilitate greater trade and capital flows, but from a monetary policy perspective, cryptocurrency and especially the Bitcoin ‘area’ is not likely to be an ‘optimal’ currency area (Yates, 2017).
2.4 A hybrid currency exchange control framework

The discussions thus far, have used traditional viewpoints to understand a very novel innovation. The focus has been on the theoretical classification of exchange rate regimes in accordance to the prescripts of the International Monetary Fund (IMF). Historically, the IMF classified members’ exchange rate arrangements under three main categories: pegged (against a single currency or a currency composite), limited flexibility vis-à-vis a single currency or group of currencies, and more flexible, including other managed and independently floating regimes (Ziky, Berentsen, & Ouchen, 2013).

Madhur (2002) conceives of two possible variants for developing countries operating within a fixed exchange rate regime with a common currency:

(1) a currency board arrangement or its equivalent involving the domestic use of the currency of another country as is the case involving the dollarization of Zimbabwe and Liberia; and

(2) the adoption of a new common currency by a group of countries, or the formation of a monetary union such as the West African Economic and Monetary Union.

A third possible currency control framework exists within the fixed exchange regime. It takes advantage of the newly developed blockchain technology underlaying Bitcoin to offer African countries a hybrid floating and fixed exchange control framework.

Under this construct, African States may create a monetary union that reintroduces elements of the Bretton woods monetary system by pegging a single African cryptocurrency to the price of gold, while allowing countries the liberty to have independent flexible currency regimes.

Essentially, a cryptocurrency backed by African states would be introduced to replace the United States Dollar as the primary currency for intra-Africa cross border trade. However, African countries will not abandon their sovereign currencies whose exchange rates will be allowed to float as they currently do.
Importantly, African countries would allow for free capital flows within the continent up to the total value of the cryptocurrency. This will create a new layer in the African monetary framework thereby introducing a hybrid monetary system that negates the strongest disadvantages associated with a single currency. It will also foster an economic ecosystem designed to spur growth, enhance financial stability, encourage investment and drive the expansion of market opportunity for Africans.

The biggest challenge beyond reaching an ideological consensus in support of a single cryptocurrency would be infrastructure and technological constraints. Aside from the slow pace at which cryptocurrencies transactions are processed, mining cryptocurrencies simply consumes too much energy (Deen, 2018).

Africa is grappling to generate enough power for domestic consumption, therefore energy intensive solutions are not ideal. However, if there are any lessons to be learnt from the mobile telephone boom, is that Fintech technology such as blockchain are poised to offer the greatest opportunities to developing countries. After all, the greatest beneficiaries of cell phone technology have been developing nations who in some instances leapfrogged developed nations in offering innovative, life changing mobile telephony and banking solutions that connects remote villagers and rural poor to global financial markets (Finkle, 2016).

2.5 Cryptoeconomics

Satoshi Nakamoto birthed the field of cryptoeconomics when he created Bitcoin in 2009 and introduced economic incentives for peer to peer value exchange systems (Tomaino, 2017). We can get an understanding of this concept through a definition offered by Ethereum developer, Vlad Zamfir, who termed it as “a formal discipline that studies protocols that govern the production, distribution, and consumption of goods and services in a decentralized digital economy” (Maguire, 2018). He sees it as a practical science that uses cryptography and economics to characterize the design of these protocols.
Vitalik Buterin (2017), the inventor of Ethereum and thought leader in this space, offers deeper explanation of the economic implications of the wide spread adoption of blockchain systems globally. He explains that blockchain technology has introduced a very technologically cheap way of creating self-perpetuating systems of value exchange. In this sense, the incentives that define the rules of a system are themselves responsible for the system’s ongoing perpetuation.

The implication of this, is that a central provider of any solution on a blockchain network does not very often need to have an infrastructure for the solution on offer. This is because the users or participants in the network are themselves the infrastructure.

This creates a very low barrier of entry with the implication that any private entity can easily launch their own highly cryptographically secure applications on a blockchain network. The low cost of creation offers great opportunity for social scalability of the blockchain networks. Simply put, the more users come onboard, the greater the valuation of the system and the more other users join the blockchain.

For governments, this means that their prevailing monopoly on the issuance of currency is being disrupted by cheaper, more efficient mechanisms for value exchange that can circumnavigate traditional governance frameworks. These new systems are highly scalable and decentralized globally.

The broad adoption of these systems, and the social scalability of the networks, is driven to a large extent by the elimination of the need for a trusted third party. There is great preference among network participants to put their trust on the mathematical accuracy of the networks than any prevailing moral code or political ideology. People basically trust that blockchain systems will do what they are designed to do without any outside influence. Traditional systems on the other hand are susceptible to human influence. There is greater credibility in blockchain technology therefore less risk and greater security for users.

The trust paradigm is especially important for African States. Many citizens on the continent have demonstrated on numerous occasions that they do not trust
their governments. This lack of trust runs deep, particularly in countries where the leadership has been repressive or autocratic (Gahigi, 2016).

The global contemporary political economy is swivelling. The focus on competitive behaviour has traditionally been strained on intense and increased competition among businesses, now on a global scale (Foster, McChesney, & Jonna, 2011). Cryptoeconomics, brings this intense competition to the monopoly enjoyed by states in the issuance of currency.

Like in other competitive paradigms, states need to evaluate what differentiates their currency offerings from other currencies. They could attempt to control and block competitors or, they could embrace the changing landscape and drive the adoption of innovation.

2.6 Chapter Summary

This chapter has provided a theoretical analysis of possible economic effects of a common regional currency in Africa. It looked at factors that impact economic growth and stability, analysed Robert optimum currency area theory and looked at the economic incentives in cryptoeconomics. It also offered the theoretical frame for the introduction of a hybrid monetary policy framework in Africa.

The analysis took the vantage of economic theories that explain cross border price fluctuations, market opportunities and threats that await countries that give up their sovereign currencies for a common currency. Informed by these theoretical prescripts, the chapter went further to review suggested ideal conditions under which a country may derive maximum benefit from having a sovereign currency with either an adjustable or a fixed exchange rate.

The chapter also offered the general conditions under which countries in a region should have a fixed rate through a common currency and juxtaposes these against cryptocurrencies. Part of the discussions delved into the advantages and disadvantages of a single currency and offered some potential threats to the adoption of an African cryptocurrency.
3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter maps out the qualitative research methodology and strategy employed in the study. It offered insights into the selection criteria for research participants, articulated the rationale for sampling decisions and described the instruments used in data collection and the modalities of analysis and presentation of said data. The presentation of the research design is concluded with an explanation of the manner with which ethical considerations were dealt.

3.2 Research design

The study used exploratory qualitative research to determine the effect of introducing a state backed cryptocurrency in Africa. Face to face, semi-structured interviews were used to gain information from subject matter experts by way of open ended questions designed to derive deep meaning. The choice was based on the assumption that, relatively flexible discussions with research subjects is necessary for gaining full and complete set of insights into the phenomenon of interest, by way of participants annotation in their own spoken or written words and observable behaviour (Taylor, Bogdan, & DeVault, 2015).

Researchers in qualitative studies may subjectively immerse themselves into the research process because they are armed with a detailed and clear understanding of the issues they seek to investigate, and follow pre-defined guidelines to conduct the investigation in a manner that they deem fit (Ranney, et al., 2015). The net effect of which was a rich interaction with research subjects and/or their broad review of relevant data to provide the basis for constructing a sound characterization of the phenomena of interest (Starr, 2012).

Brink (1993) questions the level of precision of knowledge gained through this method. He suggest that the high level of involvement of the researcher in the study creates opportunities for distortion of findings because of the subjectivity of the researcher. He also questions the rigour of the study and the extent to which the findings from qualitative research may be generalized.
While these considerations may be valid, they do not take into account the nature of questions that this study seeks to respond. Qualitative research is highly effective in responding to questions that seek to enhance understanding in areas where there is little prior knowledge and where the sample size is small (Hammarberg, Kirkman, & de Lacey, 2016). By using meandering questions, the researcher delved deep into various areas of enquiry to elicit full and accurate information.

Ultimately, the research generated words as data sets that were used to create an in-depth understanding of the possible effects of adopting a single African digital currency.

### 3.3 Sampling

A citation of Fields (2005) by Sharma (2015) explains sampling to be a small, but hopefully representative, collection of units from a population used to make judgements and derive accurate information about that population. This paper drew a sample from the broad population of economists, policy makers, bankers, and cryptocurrency experts, straddling the entire geographic breadth of Africa.

The sampling method for selecting research participants in this study was heavily embedded in the assertion that one well-placed, articulate, expert participant will often advance a research far better than any randomly chosen sample of fifty participants (Palys, 2008). Consequently, non-probabilistic, expert purposive sampling was used to carefully select highly specialised research participants in the study.

As per the method, a select group of 22 experts in the areas of international finance, international economics, forex, blockchain technology, monetary policy, fiscal policy, remittance payments and digital currencies were enrolled in the study. Additionally, some members of the committee on Monetary and Financial Affairs at the Pan African Parliament were also selected to take part in the study based on their expertise in regional legislation and their mandate to drive the integration of the African continent.
Great care was exercised when enrolling Parliamentarians to only include members with technical expertise in at least one other area mentioned above, and to select participants from the five different regions of the African continent. Additionally, the selection criteria for experts ensured that at least two experts from each discipline were enrolled in the study. They were drawn from different parts of the continent and interviews conducted either telephonically or through video calls on skype and WhatsApp.

It is important to mention that the researcher is an employee of the Pan African Parliament and therefore able to easily access Parliamentarians. However, convenience stemming from proximity and ease of access was not a primary factor when selecting participants.

Expert participants were chosen to offer greater insights into this relatively new area of research so as to determine the merits of further exploration. The sample was specifically selected to emphasize the saturation of knowledge, in that each additional participant was picked with the expectation that they will provide unique and rich information of value to the study up to the point where no more pertinent information could be gained from the addition of further participants (Etikan, Musa, & Alkassim, 2016). The challenge for the researcher, lied in determining the point at which saturation was reached to achieve the optimal sample size.

### 3.4 Data collection and analysis

The primary means of data collection in the study was in-depth semi structured interviews. Questions were bundled together in a themed framework designed to guide the discussions with research subjects. This method of inquiry was deemed effective in drawing out rich information when interrogating complex issues that require deep analysis as it allowed participants the liberty to question the relevance and purpose of questions posed to them (Castillo-Montoya, 2016). However, the open-ended nature of this data collection technique caused a variation of responses from different subjects thereby making the analysis of the rich data complex.
The interviews were voice recorded and later transcribed to preserve the full content of information drawn from the discussions. The researcher also took notes during the interview and elaborated on them soon after conclusion of the discussion. In instances where the interviewee did not want to be video recorded, an opportunity was provided for audio recording or no recording with the interviewer relying solely on note taking. In either case, the objective was to keep detailed, uniform records of interviews that can be consulted and analysed systematically ex post (Starr, 2012).

This meticulous process of data collection will be followed by the careful analysis of derived information. The researcher used a thematic stratification technique to group information with similar patterns into different codes. More specifically, the researcher set off by reading the transcripts of the research and listening to the recordings. He then identified various themes arising out of the data and developed a coding scheme which he then used to code the entire data set. The primary focus of the researcher during this process was to develop theoretical sensitivities using reasonable systematic standards that any member of the economic profession would be expected to use.

3.5 Ethical considerations

Qualitative research warrants ethical considerations that espouse the researcher as a data collection instrument. It is important to clearly elucidate the norms of conduct that help the researcher distinguish acceptable from unacceptable behaviour. To this end, this study was guided by ethical codes that cover issues of confidentiality, objectivity, honesty, integrity and openness.

In addition to the codes, participants were allowed the autonomy to opt in or out of the study. They will be required to formally communicate their consent to take part in the research voluntarily without any form of coercion or pressurization. Aside from individual participant consent, institutional consent was also sought from the Pan African Parliament to allow Parliamentarians take part in the study. The research findings were shared with all research participants and the data provided by the participants was not used for financial gain by the researcher.
Further to this, the data collected from participants was treated with the strictest confidentiality and only accessed by the research supervisor and the researcher.

Resnik (2015) presents the following arguments in support of adherence to ethical norms in research; (1) they promote the objectives of the study such as truth, knowledge and avoidance of errors, (2) they promote values that are essential for collaborative work such as trust, accountability, fairness and mutual respect, and (3) they help to build public support for research.

3.6 Limitations of the study

The first limitation for the study was the low priority that has been apportioned to research on cryptocurrencies in Africa, seeing as they have not been an issue of explicit concern for universities, governments and policy makers on the continent.

A second limitation related to the constrained scope of data collection. Participants for the research were drawn from geographic hubs on the continent that have some sort of participation in cryptocurrencies. In this regard the experts will be drawn from Nigeria, South Africa, Kenya, Senegal, Democratic Republic of Congo, and Tunisia. The replication of the study in more areas of the continent may enable better generalization of the research findings.

Further to this, Africa has a limited number of experts formally trained in any aspect of cryptocurrencies; be it economic, legal or cryptographic perspectives of the currency formulations. The skills constraints extend to policy makers, commercial bankers and central banks. This has led to limited technical information from Africa on the possible effects of cryptocurrencies on the continent’s economic framework.

The research was further constrained by time limitations. The data collection and analysis for the study will be finalised within one month in order to ensure adherence to the set deadlines for report submissions for the Masters programme that is the basis for the paper.

Additionally, the study was limited by financial resource as the research was self-funded with a budget of R 5000 set aside for expenses related to the study. This
curtailed the researcher’s ability to conduct face to face interviews with all participants located in different parts of the vast continent.

3.7 Chapter Summary

This chapter explained the research design to be used in the study. It offered a breakdown of qualitative research methodology employed, and laid out data collection and analysis techniques identified by the researcher. It also presented a detailed discussion on sampling for the study.
4. PRESENTATION OF FINDINGS

4.1 Introduction

This chapter offers a presentation of the data collected, its analysis and interpretation, with the aim of determining the effects of introducing an African cryptocurrency termed Afro-Pesa, that is backed by gold and supported by African States. More concisely, the research employed the use of case study methodology, by way of semi-structured interviews, to seek answers to the following questions:

4.1.1 Primary Question

- Would the introduction of an African cryptocurrency lead to economic growth and the stabilization of the financial ecosystem on the continent?

4.2.1 Secondary Questions

- Can a single African cryptocurrency lead to the reduction of transactional costs, reduction in currency risks, increase intra-Africa trade, increase liquidity in the economy and cause the convergence the continent’s various independent business cycles?
- What other effects would the introduction of the cryptocurrency have on the continent?

4.2 Response rate

The quality, validity and utility of the study has been assessed through the calculation of the cooperation rate (number of eligible participants who expressed their intent to take part in the study), refusal rate (number of participants who expressed intention to participate but withdrew from the study after contact was made) and overall response rate (total number of participants who completed the study). The response rate is calculated by taking the total number participants who took part in the study divided by the total number of possible interviews participants with whom contact was made or the number of all possible interviews (Morton, Bandara, Robinson, & Carr, 2012).
During the study, interview requests were sent out to 22 respondents verbally, telephonically, via email and through LinkedIn. Out of the 22, only 19 individuals responded to the invitations to interview. Following this expression of intent, a questionnaire with the broad interview questions that framed the interview was shared to these participants. This was followed by scheduling of the interviews with a minimum lead time of 48 hours from point of distribution of the questionnaires. On average, interviews took place 7 days after initial contact.

Two respondents decided to answer the questions in detail via email but opted not to be interviewed. three respondents pulled out of the study at this point indicating time constraints on their part. Fourteen respondents took part in the interviews.

Interviews with 7 of the final 14 participants were conducted face to face, 4 were conducted through WhatsApp calls and 2 via skype and one telephonically. Each interview lasted an average of 50 minutes.

<table>
<thead>
<tr>
<th>Invitations to Participate in the Study</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial invitation to participate in interview (Possible Interviews)</td>
<td>22</td>
<td>100%</td>
</tr>
<tr>
<td>No response to participate in the study (None response)</td>
<td>3</td>
<td>13.64%</td>
</tr>
<tr>
<td>Expression of intent (cooperation rate)</td>
<td>19</td>
<td>86.36%</td>
</tr>
<tr>
<td>Withdrawal from participation (refusal rate)</td>
<td>3</td>
<td>13.64%</td>
</tr>
<tr>
<td>Interview participants (response rate)</td>
<td>16</td>
<td>72.73%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mode of response from interview participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
</tr>
<tr>
<td>Number</td>
</tr>
<tr>
<td>Percentage</td>
</tr>
</tbody>
</table>

Conversely, out of the 22 distributions, 16 participants responded with data that was relevant to the survey and of those, 2 responded in writing. This translates to a 72.73% response rate and a none response bias of 27.27%. Although there typically isn't a universally agreed upon minimum response rate, Dillman, Smyth
and Christian (2014) argue that the more responses one receives, the more likely it is that the conclusions drawn from the data will be statistically significant in relation to the target population. Fincham (2008) however, considers a response rate of 60% and above to be adequate.

### 4.3 Geographic distribution

Efforts were made to recruit participants from different parts of Africa with the aim of ensuring geographic representation of the data. In this regard, invitations were sent out to specialists working in 10 or 18.52% of the 54 countries in Africa. The 10 countries are; South Africa (7), Zimbabwe (1), Mauritius (1), Kenya (4), Rwanda (1) Ghana (2), Senegal (1), Nigeria (3), Cameroon (1) and Tunisia (1).

The researcher received positive responses expressing intention to participate from South Africa (6), Mauritius (1), Rwanda (1) Kenya (3), Ghana (2), Senegal (1), Nigeria (3), Cameroon (1) and Tunisia (1).

Participants from South Africa (6), Zimbabwe (1) Mauritius (1), Kenya (2) Ghana (1), Senegal (1), Nigeria (2), Cameroon (1) and Tunisia (1) took part in the study. Some respondents who initially expressed intent to participate withdrew from the study. They were from Rwanda (1), Nigeria (1) and Kenya (1).
South Africa had the greatest geographic representation of participants at 38%. This is because the country has the most activity around cryptocurrencies and blockchain technologies in Africa. It also has the highest concentration of experts in the space and allowed easy access to the researcher for in person interviews. The spread of participants was designed to ensure participation by experts from the five regions of Africa, namely; Southern Africa, East Africa, West Africa, North Africa and Central Africa.

4.4 Characteristics of respondents

Research participants offered expertise from a wide array of specializations that fit within different spaces in the fintech ecosystem. The participants included Members of the committee of Finance at the Pan African Parliament (2), Payments specialist working at a transnational bank (1), a blockchain experts (2), a blockchain investor (1), an economist (1), A transactional banker (1), Cryptocurrency traders (2), Finance Experts managing cross border operations in Africa (2), a legal expert specializing in emerging tech (1), Digital strategists (2), and an advisor on cryptocurrency economics (1).
<table>
<thead>
<tr>
<th>Professional Expertise</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
</table>
| Members of Parliament                                | 2   | 12.5%
| Payments Specialist                                  | 1   | 6.25%
| Blockchain Experts                                   | 2   | 12.5%
| Blockchain Investor                                  | 1   | 6.25%
| Economist                                            | 1   | 6.25%
| Transactional Banker                                 | 1   | 6.25%
| Cryptocurrency trader                                | 2   | 12.5%
| Legal Expert specializing in emerging tech           | 1   | 6.25%
| Digital strategist                                   | 2   | 12.5%
| Advisor on Cryptocurrency economics                 | 1   | 6.25%
| Finance Experts (Cross Border Finance)              | 2   | 12.5%
| **Total**                                            | **16** | **100%** |

The researcher sought to determine the level of gender balance in the study and collated information for this purpose. Findings indicate that 37.5% respondents were female and 62.5 male. This indicates that the research did not achieve the desired gender representation of 50% but is higher than reported 30% average of female representation in the world’s largest technology companies such as google (30%), Facebook (31%), Amazon (37%), Twitter (30%), Apple (30%), Intel (24%) and Microsoft (29.1%) (Cheng R. , 2015).
5. DATA ANALYSIS AND INTERPRETATION

5.1 Introduction

This paper employed the use of a case study to interrogate the research questions through semi structured interviews. This method of enquiry is effective in enabling the researcher to closely examine data within a specific context at a micro level (Zainal, 2007).

The single currency construct in this study was evaluated against theories explaining economic growth and stability, the theory of optimum currency area, and crypto economics. These theories formed the basis for determining priori themes that were broadly clustered into three frames, namely; design philosophy, transactional variables and contextual factors. Additionally, the researcher teased out emergent themes from the data that resulted in the use of a hybrid model for coding the data. The emergent themes that arose during data analysis were Blockchain and Security.

The researcher followed the recommendation of Muir-Cochrane & Fereday (2006) in adopting a hybrid process of inductive and deductive thematic analysis that uses both priori and emergent codes. The former coding method helps users frame and streamline the data collection process in the field while the latter technique may offer surprising basis for interesting stories and has the potential to provide the greatest insights in the study.

The data analysis process involved an initial desktop study that led to the creation of priori themes. This process was then followed by data collection and recording through interviews, email correspondence and detailed field notes.

The voice recordings from the interviews were transcribed and the data was organized and analysed through a coding framework. Therein, the researcher grouped the data under the broad themes while creating subcategories of themes that emerged during the analysis process.

The researcher recorded the number of times a code emerged from the data and determined patterns of data that arose from the process. The researcher then
triangulated on areas of convergence on data from research participants and analysed the validity of the information against the theory in the literature.

Below is a summary of the Priori themes and accompanying sub categories

<table>
<thead>
<tr>
<th>Design Philosophy</th>
<th>Transactional Variables</th>
<th>Contextual Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub Categories</td>
<td>Sub Categories</td>
<td>Sub Categories</td>
</tr>
<tr>
<td>• Tokens /Coupons</td>
<td>• Demand Stability</td>
<td>• Control</td>
</tr>
<tr>
<td>• Distribution</td>
<td>• Flexibility</td>
<td>• Opportunity</td>
</tr>
<tr>
<td>• Policy</td>
<td>• Payment system</td>
<td>• Trade</td>
</tr>
<tr>
<td>• Commodity</td>
<td>• Velocity</td>
<td>• Administration</td>
</tr>
<tr>
<td>• Reserves</td>
<td>• Portability</td>
<td>• Authentication Level</td>
</tr>
<tr>
<td>• Utility</td>
<td>• Reversibility</td>
<td>• Acceptability</td>
</tr>
<tr>
<td></td>
<td>• Cost</td>
<td>• Price Volatility</td>
</tr>
<tr>
<td></td>
<td>• Liquidity</td>
<td></td>
</tr>
</tbody>
</table>

5.2 Design Philosophy

A primary point of dissent among research participants was the design philosophy behind Afro-Pesa. Two strands of arguments emerged from the onset of the interviews and remained a point of reference throughout the remainder of the discussions. One strand of thought was that backing the cryptocurrency with gold would decouple it from the sway of other cryptocurrencies in the market and enhance the stability of the currency.

A respondent who is a cryptocurrency trader, made the apt observation that the market prices of cryptocurrencies moved in trends such that a change in the price of one cryptocurrency would cause the volatility in the entire ecosystem. He offered the following observation;

“if you could create something and peg it against gold and it was not impacted directly by the market trends of your big crypto coins… your Bitcoins and your Ethereums are you know all up and down… If this coin that you are looking at creating doesn’t follow that trend or is not massively affected by those trends then I think that aspect of stability would be something to look at…. and if it is affected then it could have a huge negative impact on the use of that as an electronic form of cash”
In addition to this, some respondents also believed that backing Afro-Pesa with gold would introduce a tangible way of valuing the cryptocurrency and increase the level of trust in the ecosystem.

The other strand of thought believed that backing Afro-Pesa with gold was a retrogressive, and unrealistic prospect that went against the entire ethos of cryptocurrencies. They argued that the very nature of cryptocurrency was the creation of decentralized trust-less systems that rejected any notion of a central authority or intermediary. They continued to say that while gold was introduced in Afro-Pesa to effect stability into the system, its very addition was the core of the problem.

The valuation of African currencies is low because of low levels of confidence and trust in African Institutions. Some participants argued that by introducing a central entity into the ecosystem one is reintroducing the problem back into the equation. In this regard, central actors, or backers are the ones who cannot be trusted and should therefore be removed. Respondent 112183 offered the following;

“The key aspect of Bitcoin is [that] its permission-less. You don’t need to ask anyone permission to do anything and this is the key in the entire community. So by adding gold you are taking away the benefit of it… and now you are giving that central power… So now you’re putting back that element of mistrust that we all have because it will be controlled by a centralised entity or the regulating mechanism that you are introducing”.

Respondent 152181 added to the fray with the idea that even if we were to introduce gold to stabilize Afro-Pesa, eventually the currency would reach a point where it would need to be decoupled from gold in the same manner that fiat currency had to decouple. His observation was therefore that, it is simply more efficient to operate from a place without any form of backing. He pointed out that Africa was a strong leapfrog environment and it was logical to expect Afro-Pesa to leapfrog backing by gold and go straight to backing by utility. Like other respondents in the study, he called for a mind shift when dealing with cryptocurrencies and offered that we need to look at them with a fresh set of eyes.
His observation was that we are trying to solve future problems with old mindsets. This assertion was supported by Respondent 152182 who offered that;

“Millennials grow up in different environments from the ones that the creators of the current global system grew up in… They place more value on computers and social networks than gold and diamonds… and things like that… So to these young people there is greater value in things… that are prevalent and available to them. They respond to their environments in a different way and therefore they approach cryptocurrencies and money with a different mindset… and so should you”

A secondary issue pertaining to the design philosophy of Afro-Pesa was the use of the term cryptocurrency. While there is consensus on what a blockchain is, there isn’t a clear distinction between the various functions on a blockchain. The term cryptocurrency is used haphazardly to refer to any functional token that operates on a blockchain network. A distinction is important because it informs the argument on whether cryptocurrencies are commodities or currencies. It also offers clarity on arguments around centralization and decentralization of currencies. This issue was raised by respondent 152183 who said;

“…. Off course there is confusion about what cryptocurrencies really are, some people see them as transactional tools while others see them as tradeable commodities. The USA has categorized them as tradeable commodities while Japan has classified them as currencies similar to fiat currencies. I am aligned to Japan’s understanding of cryptocurrencies but we will get better convergence of a definition as more regulatory authorities get on board”

This lack of clear definition fed into a further design philosophy issue pertaining to the mode of valuing a cryptocurrency. Most participants drew close comparisons between the inherent value of fiat currency and that of cryptocurrencies. This led them to arrive at the conclusion that like cryptocurrencies, fiat currencies only have value because users believe them to be valuable. The underlying assumption is that fiat currency has no inherent worth and derives its valuation through a similar network effect to that of cryptocurrencies.
In this sense, respondents based their explanation on Metcalfe’s law which states that, “the value of a network is proportional to the square of the number of connected users of the system” (Metcalfe, 2013). This theory is effective in creating an understanding for the market valuation of social media platforms such as Facebook and Google, whose value is determined by the number of new users joining the platform. Meaning the greater the engagement the higher the valuation (Lee, 2017). A simple example would be the fact one fax machine on its own is worthless because there’s nobody to fax. But once all more people have fax machines, it becomes very valuable. In this regard, the greater the users of a fax machine the greater its utility and therefore the more valuable it becomes.

Few participants pointed to a flaw in valuing fiat currency in this way. Respondent 102182 explained that fiat currency generates its valuation from its backers who promise to settle any claims brought against the currency. This idea that fiat currency and cryptocurrencies are identical in this way is flawed because fiat currency is backed by the promise to settle debt by the issuing authority. Therefore, while fiat currency might not be backed by a commodity such as gold, it none the less enjoys the backing of a state.

5.3 Transactional Variables and contextual variables

In addition to the codification of currency design philosophy as a priori theme, the researcher created data codes around transactional variables and contextual factors as further thematic areas of interrogation. The process was informed by Brenig, Accorsi, & Müller (2015), who identified areas in which cryptocurrencies are better than fiat currencies. The researcher then focused his enquiry around the identified vulnerabilities in assessing market opportunities for Bitcoin and Ethereum. The vulnerabilities identified included variables such as anonymity, irrevocable transactions, decentralization and the implications thereof such as breadth of acceptance and borderless nature of cryptocurrencies. The analysis then evaluated the perceived benefits and weaknesses of Bitcoins and Ethereum over fiat currencies and assessed these against the model proposed for Afro-Pesa. Subsequently, the researcher used the identified categories and sub-category of themes to draw out the potential net effect of Afro-Pesa in the economy.
<table>
<thead>
<tr>
<th><strong>CONTEXTUAL FACTORS</strong></th>
<th><strong>FIAT CURRENCY</strong></th>
<th><strong>BITCOIN/ETHEREUM</strong></th>
<th><strong>AFRO-PESA</strong></th>
<th><strong>DIRECT EFFECTS (DE) and INDIRECT EFFECTS (IDE) FOR AFRO-PESA(+-)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Economic Growth</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DE</td>
</tr>
<tr>
<td>Convertibility</td>
<td>Moderate</td>
<td>Very Low</td>
<td>High</td>
<td>+</td>
</tr>
<tr>
<td>Regulation</td>
<td>High</td>
<td>No</td>
<td>Moderate</td>
<td>+</td>
</tr>
<tr>
<td>Valuation</td>
<td>Market</td>
<td>Confidence</td>
<td>Gold</td>
<td>+</td>
</tr>
<tr>
<td>Acceptability</td>
<td>Widely Accepted</td>
<td>Limited Acceptance</td>
<td>Moderate Acceptance</td>
<td>+</td>
</tr>
<tr>
<td>Administration</td>
<td>Issued by central Authority</td>
<td>Decentralized Mining and Storing</td>
<td>Decentralized Mining, Central Regulation</td>
<td>+</td>
</tr>
<tr>
<td>Transparency</td>
<td>Moderately traceable</td>
<td>High traceable</td>
<td>Highly traceable</td>
<td>+</td>
</tr>
<tr>
<td>Price Volatility</td>
<td>Relatively Stable</td>
<td>High Volatility</td>
<td>Relatively Stable</td>
<td>+</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Transaction depends on service provider</td>
<td>No Central Point of Failure</td>
<td>No Central Point of Failure</td>
<td>+</td>
</tr>
<tr>
<td>Confidence</td>
<td>Backed by State</td>
<td>Utility/Network Effect</td>
<td>Gold &amp; State</td>
<td>+</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>TRANSACTIONAL VARIABLES</strong></th>
<th><strong>Irrevocability</strong></th>
<th><strong>Payment Processing</strong></th>
<th><strong>Portability</strong></th>
<th><strong>Rapidity</strong></th>
<th><strong>Transaction Cost</strong></th>
<th><strong>Security</strong></th>
<th><strong>Infrastructure</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Revocable Transactions</td>
<td>Based on Intermediaries</td>
<td>Increasing Transferability</td>
<td>Up to Several Days</td>
<td>Varying Fees &amp; Charges</td>
<td>moderate maintenance</td>
<td>High maintenance</td>
</tr>
<tr>
<td></td>
<td>Irrevocable Transactions</td>
<td>No Intermediaries Required</td>
<td>International Transferability</td>
<td>Instantaneous Transactions</td>
<td>Low or not Existent Transaction Costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>International Transferability</td>
<td></td>
<td>Low or not Existent Transaction Costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table modelled from Brenig, Accorsi, & Müller (2015; 11)*
5.3.1 Speed, Cost and Trust

Payments on the blockchain network are decentralized without requiring any third parties. The implication is that these transactions are executed instantaneously without the need for a trusted intermediary leading to very low transactional costs. This nature of cryptocurrencies led to the following from respondent 142184;

“Most people don’t understand what cryptocurrencies are in general. They are peer to peer electronic money. That means if I have a [smart] phone here, I can use it to send money to anyone else with a [smart] phone anywhere on the planet instantly. The transfer is [near] instant and practically free. No intermediary decides whether the transaction should be executed or not….. Including financial authorities and that in itself means a financial revolution. The banks as we know them are facing extinction because we will have no need for the middleman”.

Afro-Pesa would operate on a decentralized blockchain network with various African Central Banks acting as primary nodes in the various countries. They would be supported by independent private nodes on the network. In this sense Afro-Pesa and Ethereum would be identical.

Respondents noted an expectation of a direct positive effect of introducing Afro-Pesa on economic growth, currency risk. They also reported an indirect positive effect on political integration, transactional costs, and Intra Africa trade. The sub categories that were used to evaluate these are payment processing, rapidity, transparency, transaction costs, flexibility, and portability.

5.3.2 Administration, Transparency, Irrevocability

The processing of payments within the fiat ecosystem is through trusted intermediaries who have the capacity to revoke any payment that might have been made erroneously. Third parties in the system are also essential in effecting “Know Your Customer” (KYC) rules that are critical in curtailing illegal activities. Bitcoin and Ethereum on the other hand, are decentralized. Once transactions have been conducted on a blockchain, they cannot be revoked. The recipient of the tokens must willingly return them to the intended recipient. Importantly, respondents made note of converged nodes for mining Bitcoin that exist in china and other parts of the world which have the effect of decentralizing the computing
power for mining Bitcoin. They also made mention of the possibility, maybe even occurrence, of various actors colluding within the Bitcoin ecosystem to control the cryptocurrencies monetary policy and valuation.

Afro-Pesa being a hybrid model would have a centralized administrative hub that regulates the administrative and KYC rules of the ecosystem. It would also have a decentralized operational framework with mining occurring in dispersed nodes. Like on any other decentralized network, Afro-Pesa transactions will be open for public scrutiny and completely traceable. Respondent 102185 offered the following of the strength of Bitcoin;

“Some cryptocurrencies are more traceable than any [form of] money that came before it. Every single unit of Bitcoin [for instance] is traceable through its entire monetary history. Yes Bitcoin uses anonymous accounts but once you deanonymize one account then you can begin to unravel transparent records of where the transactions go”.

On this instance respondents recorded an expectation of direct positive effect on the level of stability, political integration, currency risk and Intra Africa trade. These variables were gauged against responses on specific effects on regulation, confidence, transparency and administration. Respondents also reported a lack of clarity when it came to the administration claims against erroneous peer to peer payments. For this reason, they recorded an expectation of direct negative effect on the stability of the financial system.

5.3.3 Convertibility, Acceptability, Confidence

Convertibility refers to the ease with which a currency may be converted to either gold or another currency. Respondents reported that African fiat currencies are marginally convertible to each other when compared to currencies in other parts of the world. However, this was still better than cryptocurrencies in general. Observations were that Afro-Pesa would offer better convertibility, acceptability and confidence than African sovereign fiat currencies, Bitcoin and Ethereum. A further variable was price volatility which respondents saw as a major threat to the entire ecosystem. There was consensus that the backing with gold would calm ground Afro-Pesa and almost turn it into a haven for gold investors.
Respondents deemed the introduction of gold as a form of tokenization of gold which would drive demand for the Afro-Pesa by cryptocurrency enthusiasts.

The recorded net effect of introducing these variables is a direct and indirect positive effect on Economic growth, stability, currency risk, intra Africa trade and the integration of African business cycles. The measurement variable were convertibility, acceptability, and price volatility.

5.4 Emergent themes: blockchain & security

Two themes emerged strongly from the data collected. These are; Blockchain technology and the opportunities that they present; and the security threats that exists in the cryptocurrency ecosystem. While there was strong consensus that the mathematical cryptography built into Bitcoin and Ethereum protocols have been impenetrable thus far, there was great concern about putting a large portion of Africa’s monetary resources in one large network. It was believed that Afro-Pesa would draw substantial attack from hackers globally which it would not be able to withstand.

There was also a strong belief that innovations in quantum computing had the potential to break the cryptography for cryptocurrencies in general and this would expose Afro-Pesa’s blockchain to cyber-attacks. Even though respondents lauded the infallibility of Bitcoin and Ethereum, they demonstrated tremendous concern around the security of an African blockchain. It was very evident that most respondents did not trust Africans to build a solution that would not have any flaws in the code.

A related security concern tapped into the infrastructure supporting the functionality of the network. Most respondents pointed out that Africa has tremendous infrastructure challenges which would have to be attended to before Afro-Pesa can be operationalized across board. The security of electricity supply was of primary concern. Demand outstrips supply on the continent. Respondents pointed out the large number of African’s without access to electricity or internet and the high cost of these. Further concerns were raised about the quality and reliability of service offerings. Additionally, respondents pointed out the cost of maintaining a blockchain network. Each Bitcoin transaction for instance,
consumes 250Kwh. The network’s annual energy consumption is 32Twh. That’s 0.13% of total global electricity consumption and more electricity than is consumed by most African countries (Lee, 2017).

The constraint mentioned above withstanding, respondents expressed great excitement about the opportunities that would be presented by a continent-wide block chain. A respondent offered the following on the blockchain network that Afro-Pesa will function on;

“*The underlying architecture [or blockchain technology] of cryptocurrencies can support applications far beyond the narrow “economic role” of currencies……. The underlying infrastructure could be very strengthening to the life of information in the digital space, making it less vulnerable to the various mischief currently in place in Africa. Its open nature may allow African states to collect taxes in a more transparent way and the architecture may be used to solve challenges with the identification of citizens at the moment. The architecture could also be used to empower African citizens if it is used to conduct elections. All these attributes would be an off-shoot of Afro-Pesa*”
6. DISCUSSION, RECOMMENDATIONS AND CONCLUSION

6.1 Introduction

This study looked at the potential implications of introducing an African cryptocurrency that is backed by gold and supported by African States. The research took qualitative form and employed the use of semi-structured interviews to interrogate the subject matter. The sample population in the research was made up of the following experts; a blockchain specialist, members of parliament, a blockchain investor, a transactional banker, a payments specialist an economist, cryptocurrency traders, finance experts, digital strategists, a legal expert specializing in emerging tech and an advisor on cryptocurrency economics. The experts were drawn from various African countries including; South Africa, Zimbabwe, Kenya, Tunisia, Senegal, Ghana, Nigeria, Cameroon and Mauritius. 22 requests were sent out for interviews but only 16 people finally responded to the questions posed.

6.2 Discussion on findings

Africa grapples with a highly fragmented financial ecosystem earmarked by low levels of trust in both the governance architecture and the continents sovereign national currencies. African currencies demonstrate high currency fluctuation and low convertibility. The dollar has become the continents proverbial currency for cross border transactions. This despite the challenges it presents for African states in terms of liquidity constraints and the constraint of prudential monetary control.

Aside from this, the continent is battling high currency instability, tremendous financial risk, high rates of inflation and low levels of trade within a much more constrained market than is available. Cross border transactional costs are also remarkably higher in Africa than in other continents. All these have been termed as reasons for the low levels of intra-Africa trade.

This research sought solutions for the above challenges through the introduction of an African cryptocurrency that is backed by gold and supported by African states.
Research respondents interrogated the design philosophy behind the proposed African cryptocurrency. It became evident that there was no clear convergence around the term cryptocurrency as there are various ways to look at tokens on a blockchain network. Clarity is needed to distinguish the various elements and capabilities within the cryptocurrency ecosystem. When one uses Bitcoin as a base, then one may term the cryptocurrency as commodity money. This is because the currency is finite and there is a cost associated with mining it. Ethereum is similar with the exception that its protocol has been designed to support many more applications. The Ethereum blockchain has a currency called the Ether. However, it can support many other applications.

Some respondents were not clear in distinguishing decentralized mining and distributed ledger. This confusion prevented them from realizing that as widely and decentralized as Bitcoin is deemed to be, it has a few central actors who have the capacity to manipulate the entire cryptocurrency ecosystem. In this regard, no system is completely free of external influence and therefore no system is absolutely decentralized in the truest sense of the term.

Aside from this, most respondents argued that the introduction of gold into the Afro-Pesa model was an unnecessary complexity that made the implementation of the solution unrealistic. They offered that the benefits from such a solution could not support the cost.

We can therefore extrapolate that, it is feasible for African states to issue a cryptocurrency that operates on a blockchain network across Africa. The network can have many applications embedded on it which will support other governance applications such as smart digital identification features, smart contracts for tax collections, registration of land titles, and support for elections on the continent. All of which have the potential to affect the behavior of political actors on the continent. Simply put, when citizens are empowered through transparent systems, politicians act more ethically.

An example of how Afro-Pesa may influence the actions of politicians is citizen responses to currency collapse in Zimbabwe and Venezuela. In both countries, citizens used Bitcoin as a safe haven from their national currencies in times of turmoil (Vasquez, 2017). This poses a risk to the monopoly of sovereign
currencies and provides an incentive for political actors as it demonstrates a real risk of demand for fiat currencies falling to zero. Afro-Pesa would offer that safe haven for African citizens. In Venezuela, the country responded to the cryptocurrency by issuing its own oil backed cryptocurrency termed Petro (Otis, 2018).

However, the cost of power consumption makes this a highly inefficient solution. A respondent alluded to solutions in development phase that are set to support cryptocurrency mining activity through solar power. These solutions may offer great opportunity to Africa both in terms of infrastructure development and technical innovation. Africa also has tremendous potential for the generation of hydroelectric power which can sustain the system but the initial capital expenditure may be restrictive.

Respondents also questioned the likelihood of sovereign states giving up state control of the national currencies to external bodies. However, African governments have already demonstrated some appetite for collective governance through institutions such as the Pan African Parliament.

When assessing specific effects of the cryptocurrencies, respondents found direct positive effects of the introduction of the cryptocurrency including: economic growth, stability of the ecosystem, lower transaction costs, lower currency risk, improved currency liquidity, and improved intra-Africa trade. There were indirect positive effects on the political integration on the continent. There was also very minimal reflection of positive effect on the convergence of the business cycles on the continent. There was a strong negative perception of the security effects on the stability of the financial system.

The findings indicate that while introducing an African cryptocurrency would yield positive results, the extents or depth of those results would be determined by other supporting activities on the continent. These include improved infrastructure, better governance system, development of policies geared towards the unification of the continent and the implementation of said policies. In addition to the free flow of capital, the continent needs to allow for the free flow of labour and goods.
6.3 Conclusion

The study concludes that the introduction of an African cryptocurrency would offer substantial economic benefits to Africans. These beneficial effects would include economic growth, greater stability of the African financial ecosystem, lower transactional costs, lower currency risk, increased intra Africa trade, enhanced political integration and associated benefits emanating from the blockchain network. The continent would also benefit from associated technological benefits such as enhanced infrastructure development, greater inclusion in governance architecture by citizens and enhanced skills in the blockchain, cryptocurrency sphere in Africa.

On the other hand, the study highlighted the various stumbling blocks that stand in the way of introducing the cryptocurrency. These include, poor infrastructure, lack of regulation, lack of political cohesion, and the high energy required to power the system. Furthermore, the study showed the benefits of regulations and explored opportunities for creating hybrid systems for digital currencies. It demonstrates that central banks can issue digital currencies using distributed ledgers administered through a centralized framework.

Cryptocurrencies have created a gateway to the token economy which requires a shift in mindset from the days of old to the new economic construct awaiting us.

6.4 Recommendations

There was great consensus among research participants around the promise that an African cryptocurrency would hold for Africans. However, most respondents were opposed to the idea of an Afro-Pesa that is backed by gold and supported by African states. They favoured a completely decentralized “purist” form of a cryptocurrency without any sort of central control.

The problem with this choice is that it ignores the fundamental problem with most cryptocurrencies conceived thus far - extreme volatility. It also creates this impression that any form of central influence is bad. Yet communities, citizens, and people in general choose to have governance structures because they keep anarchy at bay.
Bitcoin is not money in the way that fiat currency is money. It has a fixed supply which causes it to behave more like commodity money. Its price is driven purely by supply and demand forces which have made it, and other similar currencies, speculative investment vehicles.

A way to fix this fundamental problem with cryptocurrencies is to introduce collateral in the form of the most stable investment asset that has stood the test of time. An asset that happens to be in great abundance in Africa. Gold.

Backing Afro-Pesa with gold would offer collateral that firms up the value of the cryptocurrency. The introduction of a centralized coordination framework in the form of an African Central Bank would ensure the smooth operation of the blockchain network that the currency would run on. Thereby stabilizing its price.

While an argument can be made for the collateral backing of Afro-Pesa with fiat currency or government bonds, the reality is that African states suffer from a concerted lack of trust. This may have a negative effect on the valuation and stability of the cryptocurrency.

With this in mind, it is recommended that;

The African Union, in conjunction with the Association of African Central Banks, create a Fintech think tank, tasked with coordinating the creation of an African, Open Source, Blockchain Network like Ethereum. The network should be able to support various public governance applications such as digital identification, title deed registration and elections governance in Africa. Afro-Pesa should be embedded onto the core network with special security protocols and interest governance mechanisms.

This Central Coordinating consortium should work in close collaboration with the various regional economic communities in Africa to fast track the integration agenda of the continent, including; policies around free flow of goods and labour, and the integration of Infrastructure development plans on the continent.
6.4.1 Areas for further studies

1. Further study should be undertaken to determine the possible risks associated with cryptocurrencies in Africa
2. Research should also be conducted to determine if there is a way through which cryptocurrencies may be used to bank the unbanked in Africa
3. Research should also be conducted on how blockchain technology can be used in election governance in Africa
REFERENCES


Lee, T. (2017, October 18). Top Strategist: Bitcoin will soar to $25,000 in 5 years. (S. Silverstein, Interviewer)


