A CRTICAL ANALYSIS OF CRYPTO CURRENCY AND ITS DEPENDABILITY IN ECONOMIC DEVELOPMENT

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Abstract

With its promises of decentralization, transparency, and security, cryptocurrency has become a disruptive force in the global financial environment. The reliability of cryptocurrencies in promoting long-term, sustainable economic growth is examined in this rigorous examination. Proponents contend that digital currencies such as Bitcoin and Ethereum lower transaction costs and promote financial inclusion, but detractors highlight significant issues with volatility, regulatory ambiguity, and security. This study explores both viewpoints by assessing the financial effects of cryptocurrencies in established and developing nations, as well as their significance in international trade, investment prospects, and financial market integration. The report also looks at how blockchain technology affects conventional banking institutions and how decentralized finance (DeFi) can upend established economic systems. The research findings indicate that although cryptocurrencies have noteworthy prospects for financial innovation, their stability as a fundamental component of economic growth is still questionable in the absence of strong regulatory structures, technical breakthroughs, and increased cultural acceptability. This sophisticated approach emphasizes the need of taking a balanced approach, considering the dangers and benefits of cryptocurrencies in terms of long-term economic advancement. In order to ensure that cryptocurrency can be safely integrated into the financial system, the study also recommended that governments and financial regulators work towards establishing a comprehensive and internationally coordinated regulatory framework that strikes a balance between innovation and security and addresses issues like market volatility, investor protection, and the prevention of illicit activities.

Keywords: Crypto Currency, Dependability and Economic Development

Introduction

Cryptocurrency is a type of digital or virtual money that employs cryptography for protection. It has become a major financial invention that will have a big impact on the growth of the world economy. The idea of decentralized money has attracted a lot of interest

since the launch of Bitcoin in 2009, which has prompted the emergence of several other cryptocurrencies, such as Ethereum, Ripple, and Litecoin. The decentralization, security, and transparency of transactions are guaranteed by the blockchain technology that powers these virtual currencies. The rise of crypto currency has sparked debates among economists, policymakers, and financial experts regarding its potential to drive economic development, particularly in emerging markets where traditional banking infrastructure is limited (Nakamoto, 2009 cited in Tapscott & Tapscott, 2017).

According to Narayanan (2016) cited in Ali (2021) the role of crypto currency in economic development is multidimensional. On the one hand, it provides access to financial services without the need for middlemen like banks, therefore offering a decentralized financial system that may empower people and enterprises. This is especially true in areas with undeveloped financial institutions, as cryptocurrencies may lower transaction costs and promote financial inclusion. However, there are questions over the durability and reliability of cryptocurrencies as a vehicle for economic growth due to their volatility and regulatory issues. The speculative nature of cryptocurrency markets, which may result in large price swings and possible losses for investors, exacerbates these worries. By encouraging international investment and commerce, cryptocurrencies have the potential to enhance economic progress. Because digital currencies are decentralized, they facilitate smooth international transactions and cut down on the time and expense of currency translation and transfer fees.

However, Small and medium-sized businesses (SMEs) in underdeveloped nations may find this especially helpful, as they frequently encounter obstacles when trying to reach international markets because of expensive transaction fees. Furthermore, the creation of a strong regulatory framework that strikes a balance between security and creativity is necessary for the integration of cryptocurrency into the global economy. El Salvador is one of the nations that have embraced cryptocurrency, but the consequences have been uneven. Some have experienced economic instability as a result of the volatility of digital currencies. Therefore, in order to evaluate the long-term effects of cryptocurrency on economic growth and to determine methods for reducing the dangers involved, extensive study is required. This includes exploring the role of central bank digital currencies (CBDCs) as a more stable alternative to decentralized crypto currencies (Auer & Böhme, 2020). Although cryptocurrency offers great potential for economic growth, especially in terms of cross-border commerce and financial inclusion, its reliability is still being closely examined. The necessity for a careful approach to incorporating cryptocurrency into the global financial system is highlighted by its volatility, regulatory hurdles, and potential for misuse.

Concept of crypto currency

Any digital or virtual money that employs cryptography to safeguard transactions is referred to as "cryptocurrency," or simply "crypto." The reason cryptocurrency got its moniker is that transactions are verified by encryption. This indicates that the storage and transmission of cryptocurrency data between wallets and to public ledgers require sophisticated code. Cryptocurrencies are becoming a more and more common substitute for internet payments. As One would need a cryptocurrency wallet in order to utilize cryptocurrency. Over the past several years, there has been a 100-fold growth in both the

acceptability and demand for cryptocurrency. At hundreds of exchanges worldwide, crypto currencies are currently easily accessible in exchange for fiat money. These days, a lot of big businesses are integrating cryptocurrency into their payment systems.

Cryptocurrency is a type of digital money that operates independently of a central bank or government and is intended to be used as a means of trade across computer networks. From a financial perspective, it has developed into a distinct asset class. Eken & Baloglu (2017) highlight that for the past few years the future of money has received considerable attention. The digitalization of business models and advancements in technology provided the framework for the creation of new money in the shape of several crypto currencies. They went on to say that these virtual currencies may make the economy more open and productive.

A crypto currency is a virtual or digital money that is protected by cryptography and is very difficult to counterfeit or use twice. Utilizing block chain technology as a distributed ledger maintained by a dispersed network of computers, the majority of cryptocurrencies operate on decentralized networks. The fact that cryptocurrency is often not issued by a single entity makes it potentially resistant to manipulation or intervention by the government. Hameed & Farooq (2016) stated that Crypto currency systems generally claim to provide anonymous, decentralized processing of transactions. An additional protective precaution for user privacy and confidentiality can be used with this anonymity.

Concept of dependability

The term "dependability" describes a broad range of attributes, including the consistency, dependability, and credibility of people, organizations, and systems. Generally speaking, dependability includes a number of essential qualities, such as safety, maintainability, availability, and dependability. These qualities are essential for guaranteeing that processes and systems operate as intended across time and in a variety of circumstances. Reliability and the stability and credibility of systems and procedures are strongly related in the context of organizational and economic management. For companies, dependability is supplying goods or services with consistency, according to rules, and performing as promised. Among stakeholders, partners, and customers, this attribute promotes trust. High-reliability organizations are frequently in a better position to forge enduring bonds and acquire a competitive edge. For instance, companies known for their reliable customer service and consistent product quality tend to enjoy higher customer loyalty and market share (IMF, 2019).

In economic development, dependability is essential since it serves as a foundation for growth and stability in the economy. Dependability in the context of economic growth refers to a variety of elements, such as solid institutions, dependable infrastructure, and consistent policies. Transportation, energy, and telecommunications infrastructure that is dependable is essential to the smooth operation of enterprises and the conduct of economic activities. For instance, the World Bank emphasizes that high-quality infrastructure directly impacts economic growth by reducing transaction costs and facilitating trade (World Bank, 2020). Reliable infrastructure facilitates corporate expansion and improves the state of the economy overall. Because it influences the robustness of the financial system, institutional

stability, consistency of policy, and infrastructural reliability, dependability is essential to economic development. All of these elements work together to create a predictable and stable economic climate, which is necessary to promote long-term development, investment, and innovation. Building and sustaining trustworthy institutions and processes is essential to attaining sustainable economic growth and enhancing overall economic performance, as several research and organizations have shown.

Concept of economic development

The process of converting low-income, basic national economies into sophisticated industrial economies is known as economic development. While the phrase is occasionally used interchangeably with economic growth, its primary meaning is a shift in a nation's economy that encompasses both qualitative and quantitative advancements. Terms like "industrialization," "Westernization," and "modernization" are also frequently employed in discussions of economic growth. Panth (2021) mentioned that economic development is regarded as important for a country to reduce its poverty by providing more employment, higher incomes, improved goods and services, and latest technologies of production.

Quality enhancements, risk reduction, innovation, and entrepreneurship that put the economy on a better growth trajectory are the main goals of economic development. Programs, policies, or initiatives aimed at enhancing a community's economic health and standard of living are referred to as economic development. Economic development is far from a homogeneous and well-organized field of applied research (Levine & Tantardini, 2023). Economics of development explores how societies have, could, and should work to enhance the standard of living for their citizens in terms of both quantity and quality.

Infrastructure and long-term investments in the creation, sharing, and assimilation of new ideas are the foundations of economic progress. Long-term, massive investments and cooperative activity are necessary for economic growth. Conscientious administrative action is what drives economic progress. In addition to increasing equitable work opportunities and civil and political rights, it is structured to achieve a steady rise in material living standards, health, education, and environmental protection. Angelov (2023) explained that economic development is critical for countries around the world to improve living standards and reduce poverty. It takes a lot of work and consideration of many different aspects to achieve sustainable economic growth.

Types of crypto currency

The vast number of digital assets known as cryptocurrencies varies with respect to their basic concepts, use cases, and technology. They may be broadly divided into many sorts, each having specific functions in the digital economy. The types of cryptocurrency are as follows:

- Bitcoin (BTC)

When discussing digital currency, the most common coin that people mention is still Bitcoin. Created in 2009 by an unnamed person or group known only as Satoshi Nakamoto, Bitcoin is the first and most well-known cryptocurrency. It functions mostly as a

decentralized digital currency that dispenses with the need for middlemen like banks and allows peer-to-peer transactions. Bitcoin's blockchain technology ensures transparency and security, making it a popular choice for both investment and as a medium of exchange (Narayanan, 2016).

- Altcoins

Many other cryptocurrency currencies, sometimes known as "altcoins," have been created after Bitcoin. Among these is Ethereum (ETH), which made it possible to create decentralized apps (dApps) on its platform by introducing smart contracts—self-executing contracts with the conditions directly encoded into code. Other notable altcoins include Litecoin (LTC), which offers faster transaction times compared to Bitcoin, and Ripple (XRP), designed specifically for cross-border payments and remittances (Bonneau, 2015).

- Stablecoins

A kind of cryptocurrency known as a "stablecoin" is one whose value is tied to a stable asset, such the US dollar or a basket of other stable assets, in order to reduce price volatility. Tether (USDT), USD Coin (USDC), and DAI are a few examples. These coins are commonly used for trading, as they offer the benefits of crypto currency without the extreme price fluctuations typically associated with digital assets (Schär, 2021). To ensure the value of the cryptocurrency, the organization in charge of the peg is supposed to keep reserves.

- Utility Tokens

Within a blockchain environment, utility tokens are cryptocurrency that grant users access to a certain good or service. On the Ethereum network, for instance, transactions and computational services are paid for with ether (ETH). In a similar vein, Binance Coin (BNB) is utilized to take part in token sales on the Binance Launchpad and cover trading costs on the Binance Exchange. A use case is a specific purpose or function that a Utility Token fulfils on the blockchain.

- Governance Tokens

One kind of cryptocurrency called a "governance token" allows its owners to cast votes on issues that have an impact on how a blockchain project is developed and run. Usually, these currencies are connected to decentralized finance (DeFi) platforms, where users may cast votes on proposals for system improvements, money distributions, or protocol modifications. Maker (MKR) and Uniswap (UNI) are two examples.

Effect of cryptocurrency in Nigeria economy

The impact of cryptocurrencies on capital flows, financial inclusion, and economic stability may be used to analyze their effects on the Nigerian economy.

- Financial Inclusion and Accessibility

With cryptocurrency, the unbanked and underbanked may now access financial services, potentially improving financial inclusion in Nigeria. All that is required to access cryptocurrencies is an internet connection and a smartphone to take advantage of the

decentralized alternative. This greater accessibility can lower remittance costs, enable more safe and efficient transactions, and enable people to take part in the global economy. The decentralized nature of cryptocurrencies allows individuals to conduct transactions without relying on traditional financial institutions, thereby reducing barriers to entry for millions of Nigerians (Nduka, 2020).

- Capital Flows and Investment

In Nigeria, cryptocurrency has created new opportunities for investment and money movements. A sizable segment of the populace trades cryptocurrencies, making the nation a center for those interested in purchasing, holding, and selling digital assets. Foreign investment has been drawn to this, especially in the fintech space, where firms are using blockchain technology to develop cutting-edge financial services and products. Furthermore, for Nigerians looking to protect their wealth from the Naira's instability and inflationary pressures, cryptocurrencies have offered another method. The influx of capital into the cryptocurrency market has also spurred economic activity and job creation within the tech and financial sectors (Ekechi, 2021).

- Economic Stability and Innovation

However, the use of cryptocurrencies in Nigeria may promote stability and innovation in the country's economy. The nation can lessen corruption, create more effective and transparent financial systems, and make conducting business easier by utilizing blockchain technology. Financial transactions may be made more trustworthy by using decentralized finance (DeFi) platforms and smart contracts to optimize workflows and lower transaction costs. Furthermore, the Nigerian government is looking at how to use blockchain technology to promote economic growth after seeing its potential. The National Blockchain Adoption Strategy is one initiative that aims to establish a legal framework that balances reducing the dangers associated with cryptocurrencies with promoting innovation. If well carried out, these initiatives have the potential to establish Nigeria as a pioneer in the digital economy and draw in more capital for the technology industry.

The challenges of cryptocurrency in Nigeria

The emergence of cryptocurrencies in Nigeria has drawn attention from a number of parties, including the public, financial institutions, and the government. It has also been a noteworthy development. Notwithstanding its possible advantages, a number of obstacles prevent bitcoin from being widely accepted and integrated in Nigeria.

- Regulatory Uncertainty

The absence of definite and uniform regulatory frameworks is one of Nigeria's biggest problems with cryptocurrencies. The usage of cryptocurrencies has alarmed the Central Bank of Nigeria (CBN), which points out that they might be used to support illicit activities including fraud and money laundering. In February 2021, the CBN issued a directive prohibiting financial institutions from dealing with cryptocurrency exchanges, which created a significant barrier to the adoption and use of cryptocurrencies in the country (Olayinka, 2021). Due to concerns about potential legal ramifications, both users and

potential investors are reluctant to interact with cryptocurrencies as a result of the regulatory ambiguity.

- Volatility and Risk

The values of cryptocurrencies are infamously erratic, changing significantly over brief periods of time. For investors and users in Nigeria, where economic stability is already a problem, this volatility presents a substantial danger. Many Nigerians believe that investing in cryptocurrencies is risky and that losing a lot of money might happen if the market moves against them. The lack of understanding and education about the mechanisms driving cryptocurrency prices further exacerbates this risk (Ehimare, 2022).

- Cybersecurity Threats

One further significant obstacle is the cybersecurity problem. Cybercriminals are drawn to cryptocurrencies because of its decentralized structure, since they may steal money by taking advantage of weaknesses in digital wallets and exchanges. The possibility of cyberattacks significantly hinders the wider use of cryptocurrencies in Nigeria, where cybersecurity infrastructure is still growing. Users are often unaware of the best practices for securing their digital assets, leading to a higher incidence of fraud and theft (Ogunleye, 2023).

- Lack of Awareness and Understanding

In Nigeria, there is still a general lack of knowledge and comprehension of cryptocurrencies despite the rising interest in them. The underlying technologies, including blockchain, and the possible advantages and disadvantages of cryptocurrencies are not well known to the general public. Because there is less access to technology and information in rural regions, there is a particularly noticeable knowledge gap there. The lack of education and awareness hampers the growth of cryptocurrency adoption, as potential users remain skeptical or unaware of how to safely engage with digital currencies (Ogunjobi, 2022).

The operation of crypto currency in banking sector of Nigeria

Nigeria is not an exception to the opportunities and difficulties that the emergence of cryptocurrencies has brought to the global banking industry. Nigeria's banking sector has seen an increase in interest in incorporating blockchain technology and virtual currencies into its operations, as the country has the largest economy in Africa and is a major participant in cryptocurrency trading. However, due to infrastructure restrictions, security concerns, and legal limits, the adoption of cryptocurrencies in Nigeria's banking industry is still complicated.

Nonetheless, there are a few significant limitations on how cryptocurrency is used in the financial industry. Among these limitations are:

- It is imperative that a Nigerian bank prohibits the withdrawal of funds from a Crypto Business Account.
- It is imperative that a Nigerian bank prohibits the clearance of third-party checks from a Crypto Business Account.

- The only way to settle a transaction involving virtual or digital assets is to transfer the funds to another Crypto Business Account.
- After three (three) straight months without any transactions, a Nigerian bank is required to declare a cryptocurrency business account dormant and close it.

The decentralized blockchain technology that underpins cryptocurrencies enables peer-to-peer transactions free from middlemen like conventional institutions. This directly challenges the highly centralized financial system that currently exists in Nigeria. The decentralized character of cryptocurrencies poses a challenge to the established banking system by perhaps eliminating the need for middlemen in financial transactions. Moreover, cryptocurrencies offer quicker and more cost-effective international remittances, bypassing the high fees typically associated with banks in cross-border transactions (Alabi, 2020).

As mentioned by Osazuwa, et.al (2024), Cryptocurrency possesses the attributes of both money and securities. Certain cryptocurrencies may be used to purchase goods and services much like cash, whereas other cryptocurrency projects are more like investments or securities with the possibility of future gains. By means of its Circular to Banks and Other Financial Institutions on Virtual Currency Operations in Nigeria (the "Circular"), the CBN directed banks and other financial institutions on January 12, 2017, to refrain from using, retaining, or conducting any kind of transaction involving virtual currencies; to put in place efficient anti-money laundering and counterterrorism financing controls (AML/CFT) for their current clients who are virtual currency exchanges; and to report any suspicious transactions by these clients.

Later, on February 5, 2021, the CBN implemented more steps to limit cryptocurrency trading through official channels in its Letter to All Deposit Money Banks, Non-bank Financial Institutions, and Other Financial Institutions (the "Letter"). The CBN declared in the letter that regulated institutions are not allowed to trade in cryptocurrencies or process payments for cryptocurrency exchanges. Additionally, the CBN ordered the regulated banks and other institutions to locate and terminate the accounts of any individuals or organizations that are transacting in cryptocurrencies or running cryptocurrency exchanges on their networks. The letter essentially barred bitcoin companies from using Nigerian financial institutions' services.

It is significant to remember that the CBN did not forbid cryptocurrencies in Nigeria, as was stated in the Circular and Letter. Rather, it simply forbids the processing or facilitation of such transactions by banks and other financial institutions that are statutorily subject to its regulatory authority. As a result, those wishing to deal in cryptocurrencies were compelled to alter course or switch to peer-to-peer (P2P) cryptocurrency business models. However, the CBN removed its more than two-year ban on financial institutions maintaining accounts for cryptocurrency service providers or processing transactions connected to cryptocurrencies in December 2023, following the election of a new administration and the publishing of the VASP Guidelines. The prohibition on financial institutions handling cryptocurrencies was repealed, but the prohibition on them facilitating transactions for cryptocurrency firms persisted.

As a result, financial institutions are now able to create bank accounts for cryptocurrency firms as long as they meet the guidelines' standards, as per the VASP Guidelines. The crypto platform has to, among other things, have an appropriate license or registration from the SEC. Despite these benefits, the volatility of cryptocurrencies and the dangers of money laundering and fraud have prevented the Nigerian banking industry from completely embracing them. The Central Bank of Nigeria (CBN) has continued to take a cautious approach, releasing rules that restrict financial institutions' use of cryptocurrencies. These regulations are aimed at protecting the integrity of the financial system while addressing the challenges of money laundering and the financing of terrorism, which are prevalent issues in cryptocurrency operations (Olawuyi & Mgbemena, 2021).

The introduction of Nigeria's eNaira, or Central Bank Digital money (CBDC), in 2021, however, denotes a change in the direction of incorporating digital money into the banking industry. The eNaira is a cryptocurrency that uses blockchain technology, even if it is not decentralized. This suggests that the Nigerian financial sector is open to investigating the possibilities of blockchain technology. This move underscores the realization that digital currencies, whether decentralized or centrally controlled, will play a crucial role in the future of banking (Adebayo & Samuel, 2022).

Conclusion

The critical analysis of crypto currency reveals its potential as a transformative tool for economic development, particularly in promoting financial inclusion and facilitating cross-border trade. However, its dependability is challenged by significant risks, including market volatility, regulatory uncertainties, and potential misuse for illicit activities. While crypto currency offers innovative opportunities, the need for a robust regulatory framework that ensures stability and security is paramount. As the global economy continues to evolve, careful consideration must be given to the integration of crypto currency to maximize its benefits while mitigating its inherent risks.

Recommendations

1. Governments and financial regulators should work towards establishing a comprehensive and globally coordinated regulatory framework that balances innovation with security and address issues such as market volatility, investor protection, and the prevention of illicit activities, ensuring that crypto currencies can be safely integrated into the financial system.
2. central banks should explore the development of Central Bank Digital Currencies (CBDCs) as a more stable alternative to decentralized crypto currencies. CBDCs can offer the benefits of digital currency, such as lower transaction costs and enhanced financial inclusion, while maintaining the stability and oversight of traditional financial systems.
3. International collaboration is crucial to addressing the cross-border nature of crypto currency transactions. Countries should work together to harmonize regulations, share intelligence on illicit activities, and develop common standards for crypto currency exchanges and wallets.

REFERENCES

Adebayo, O., & Samuel, O. (2022). The Central Bank Digital Currency (CBDC) and its impact on the Nigerian economy: Opportunities and challenges. *Journal of Digital Finance.* 3(1): 45-59.

Alabi, O. (2020). Cryptocurrency and the future of banking in Africa: A Nigerian perspective. *African Journal of Economics and Finance.* 12(2): 117-136.

Ali, R., Barrdear, J., Clews, R., & Southgate, J. (2021). The economics of digital currencies. Bank of England Quarterly Bulletin, 2021 Q3.

Angelov, I. (2023). *The Square Theory of Economic Development*. Available at SSRN 4364258.

Auer, R., & Böhme, R. (2020). *The technology of retail central bank digital currency. BIS Quarterly Review, March 2020.*

Bonneau, J., Miller, A., Clark, J., Narayanan, A., Kroll, J. A., & Felten, E. W. (2015). Sok: Research perspectives and challenges for bitcoin and cryptocurrencies. *IEEE Symposium on Security and Privacy*, 104-121.

Ehimare, B. (2022). Understanding cryptocurrency volatility and its impact on Nigerian investors. *Journal of Economic Perspectives*, 27(4), 54-69.

Ekechi, C. (2021). The rise of cryptocurrency in Nigeria: Impacts on the economy and investment landscape. *African Journal of Economics and Finance*, 9(4), 67-81.

Eken, M. H., & Baloglu, E. (2017). Crypto currencies and their destinies in the future. *International Journal of Finance & Banking Studies*, 6(4).

Hameed, S. & Farooq, S. (2016). The Art of Crypto Currencies. *International Journal of Advanced Computer Science and Applications*. 7(12).

International Monetary Fund (IMF) (2019). *World Economic Outlook: Growth Slowdown, Precarious Recovery.* Retrieved from IMF

Levine, E. J., & Tantardini, M. (2023). Defining and measuring economic development: A literature review and outlook. *Journal of Public and Nonprofit Affairs*, 9(3), 1–32.

Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). *Bitcoin and cryptocurrency technologies: A comprehensive introduction. Princeton University Press.*

Nduka, M. (2020). Cryptocurrency and financial inclusion in Africa: The Nigerian experience. *Journal of Financial Technology and Innovation*, 6(2), 23-34.

Ogunjobi, S. (2022). Bridging the cryptocurrency knowledge gap in Nigeria: Challenges and opportunities. *African Journal of Digital Finance*, 9(2), 45-60.

Ogunleye, M. (2023). Cybersecurity challenges in the era of cryptocurrency in Nigeria. *Journal of Nigerian Information Technology*, 12(1), 78-89.

Olawuyi, T. O., & Mgbemena, O. M. (2021). Cryptocurrency regulation and the banking sector in Nigeria: Implications for financial stability. *Journal of Banking and Financial Technology.* 4(3): 89-101.

Olayinka, O. (2021). Cryptocurrency regulation in Nigeria: An analysis of the CBN's directive. *Nigerian Journal of Legal Studies*, 23(2), 34-49.

Osazuwa, T., Akinmodun, P., Popoola, M. & Agunbiade, A. (2024). Overview of Nigeria's dynamic cryptocurrency regulatory landscape. Extracted from: International Bar Association. Available at: https://www.ibanet.org/overview-of-cryptocurrency-regulatory-landscape-nigeria

Panth, P. (2021). *Economic development: Definition, scope, and measurement. In No poverty (pp. 231-243). Cham: Springer International Publishing.*

Schär, F. (2021). Decentralized finance: On blockchain- and smart contract-based financial markets. *Federal Reserve Bank of St. Louis Review*. 103(2): 153-174.

Tapscott, D., & Tapscott, A. (2017). *Blockchain revolution: How the technology behind bitcoin is changing money, business, and the world. Penguin.*

World Bank. (2020). *Infrastructure for Development: The Role of Infrastructure in Economic Growth. Retrieved from World Bank*