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ARTICLE SERIES

THE CHANGING FACE OF FINANCE - THE EMERGENCE OF DECENTRALISED FINANCE AS AN ALTERNATIVE FINANCIAL SYSTEM

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Introduction

There are currently over 4000 (four thousand) cryptocurrencies in circulation [1] and about 51,200,000 (fifty-one million, two hundred thousand) active traders of cryptocurrency around the world [2]. With the proliferation of cryptocurrency and the associated technology that backs it, disruptors and innovators have begun to take advantage of the multifunctional nature of cryptocurrency [3] and have created products that could change or disrupt traditional banking and finance. Enter Decentralised Finance or 'DeFi' for short.

DeFi refers to an emerging area of finance where financial products are offered to customers using blockchain technology such as smart contracts, limiting reliance on the traditional institutional nature of finance where financial products and services are offered by banks and other financial institutions.

When compared to the traditional or centralised financial industry, DeFi is still a small drop in a big pond. However, DeFi products or protocols have started growing rapidly and are attaining monumental gains. In 2019, only USD$275,000,000 (Two Hundred and Seventy-Five Million Dollars) worth of cryptocurrency was locked in the DeFi economy [4].

By February 2020, that number grew to USD$1,000,000,000 (One Billion Dollars) and by January 2021, over USD$40,000,000,000 (Forty Billion Dollars) worth of cryptocurrency has been used on decentralised financial products [5].

So, with this rapid growth of decentralised financial products, it is important to consider whether DeFi as an alternative financial infrastructure is complementary or an adversarial to traditional financial and banking systems.

In this article, we will attempt to answer this question by breaking down what DeFi is, highlighting some DeFi products, examine the advantages and disadvantages of DeFi, and conclude with our opinion on the future of DeFi.

Understanding Decentralised Finance

Dr. Usman W. Chohan, an international economist-academic, describes decentralised finance as

[1] "The 10 Most Important Cryptocurrencies Other Than Bitcoin" by Luke Conway, reviewed by Julius Mansa for Investopedia, accessed 2 June 2021. https://www.investopedia.com/tech/most-important-cryptocurrencies-other-than-bitcoin/.
[2] Patrick Bucquet, Marie Lermite and Ally Jo in partnership with Coqonut, 2019, How many active crypto traders are there across the globe? Chappuish Halder and Co.
[3] To understand the types of cryptocurrency and their various functionalities, you can read our article on Cryptocurrency and Initial Coin Offerings which can be accessed here.
[4] "What is Decentralized Finance (DeFi)?" by On Yavin for City A.M, accessed 2 June 2021. https://www.cityam.com/what-is-decentralized-finance-defi/.
[5] "What is Decentralized Finance (DeFi)?" by On Yavin for City A.M, accessed 2 June 2021. https://www.cityam.com/what-is-decentralized-finance-defi/.
"What Happens When Cryptocurrencies Earn Interest?" by Marco Di Maggio, Nicholas Platias, Wenyao Sha, and Nicolas Andreoulis for Harvard Business Review, accessed 2 June 2021. https://hbr.org/2021/02/what-happens-when-cryptocurrencies-earn-interest.

"…an experimental form of financial praxis that is removed from dependence on centralized financial intermediaries, which in this context might include banks, exchanges and brokerages. As such, DeFi purports to disintermediate financial activity from the traditional mechanisms of finance, and it does so through the use of a blockchain substitutive architecture. [6]"

In a nutshell, DeFi is a movement that aims to create an open-source and transparent financial service ecosystem that is available to everyone and operates without any central authority such as banks or brokers. The users maintain full control over their assets and interact with this ecosystem through peer-to-peer (P2P) applications that are decentralised "Dapps [7].

Dapps are used by DeFi protocols or products customers to interact which each other and are powered by 'Smart Contracts', programs which run like contracts when predetermined conditions are met and are stored on a blockchain.

Smart Contracts are self-executing contracts with the terms of the agreement being directly written into lines of code, such that when the pre-agreed conditions are met, the smart contract enforces performance of the relevant terms of the agreement. The code and the agreements contained therein exist on a blockchain network. The code controls the execution, and the transactions are trackable and irreversible [8].

Ethereum.org defines a Dapp as an application built on a decentralized network (blockchain) that combines a smart contract and a frontend user interface [9]. Therefore, the layers of a DeFi product are made up of the backend (Smart Contract) which contains the terms and conditions embedded in the line of code and the frontend (Dapp) which the users interact with. The Dapp can be programmed to carry out various functions to enhance the user experience like tools to compare and rate services, allow users to perform otherwise complex tasks by connecting to several protocols simultaneously, and combine relevant information in a clear and concise manner [10].

[6] Usman W. Chohan, MBA, PhD, 2021, Decentralized finance (DeFi): an emergent alternative financial architecture, Discussion Paper Series: Notes on the 21st Century, Critical Blockchain Research Initiative.
[7] "The Complete Beginner's Guide to Decentralized Finance (DeFi)" by Binance Academy, accessed 2 June 2021. https://academy.binance.com/en/articles/the-complete-beginners-guide-to-decentralized-finance-defi.
[8] "Smart Contracts" by Jake Frankenfield, reviewed by Erika Rasure for Investopedia, accessed 2 June 2021. https://www.investopedia.com/terms/s/smart-contracts.asp.
[9] "INTRODUCTION TO DAPPS" by Ethereum, accessed 2 June 2021. https://ethereum.org/en/developers/docs/dapps/.
[10] Federal Reserve Bank of St. Louis Review, Second Quarter 2021, 103(2), pp. 153-74.
https://doi.org/10.20955/r.103.153-74.

Dapps are the means by which customers access DeFi products. For example, Luffy may be looking to get a loan and instead of going to a bank, he could decide to log on to a Dapp which compares and rates the different services on offer. Upon selecting one of the offers, Luffy enters into a Smart Contract and accordingly, the Dapp stipulates the conditions required of Luffy for disbursement of funds. Once Luffy fulfils these conditions, the disbursement term of the Smart Contract is executed and the loan amount is disbursed to Luffy (usually in cryptocurrency) instantly and parties are bound by the Smart Contract.

The DeFi product ,a loan in the example above, may also be secured by collateral. Subject to the terms of the Smart Contract, collateral may be deposited in an escrow account (off-chain collateral) or the collateral is deposited on the native blockchain the Dapp is built on usually in the form of the cryptocurrency native to the blockchain (on-chain collateral). In some cases, there may be no collateral requirement at all [11].

The hypothetical loan transaction is just one of the many financial services/products available via DeFi. In the next section, we will explore a few DeFi products.

Decentralised Finance – Financial Services and Products

Though there are several ways DeFi protocols are being used today, we will highlight the most prominent use cases

Stablecoins

Stablecoins are the most popular use cases of DeFi protocols around the world because crypto holders, traders and even Whales (individuals who own a large amount of a particular cryptocurrency) can hedge against the volatility of the prices of cryptocurrency by buying digital assets that are pegged against fiat currency (money issued by a government and declared as legal tender) or commodities.
Stablecoins are digital assets tied to a stable asset such as fiat currency or a commodity like gold. They tend to stay stable for longer periods of time than those that are non-asset backed e.g., Bitcoin (“BTC”) or Ethereum (“ETH”). The entity issuing the stablecoin usually sets up a “reserve” where it securely stores the asset backing the stablecoin [12] and theoretically, the holder of the stablecoin can redeem one unit of the stable coin for one unit of the asset that backs it i.e., 1USD Coin (“USDC”) for $1.

[11] Federal Reserve Bank of St. Louis Review, Second Quarter 2021, 103(2), pp. 153-74. https://doi.org/10.20955/r.103.153-74.
[12] “What Are Stablecoins?” by Alyssa Hertig for Coindesk, accessed 3 June 2021. https://www.coindesk.com/what-are-stablecoins.

There are also some complex forms of stablecoins backed by other stablecoins. For example, the NGN Token ("NGNT") is a collateral-backed digital currency issued by Token Mint that is pegged to the value of the Naira and is not volatile. In addition to being pegged to the value of the Naira, NGNT is also backed by USDC. USDC is issued by regulated financial institutions in the United States, and backed by fully reserved assets, and redeemable on a 1:1 basis for US Dollars [13]. Therefore, a holder of NGNT, can redeem the USDC equivalent of NGNT he holds and trade it in for US Dollars.

However, criticism of stablecoin as a DeFi product remain. Critics argue that stablecoins are only as stable as the asset backing them; thus, they are still affected by the volatility of the underlying asset [14]. They also believe that there is a counterparty risk investors need to note as most stablecoin issuers do not specify where they store their 'reserves' and how much value is actually stored. In instances where the value of the reserves of the issuer is less than the value of the stable coin issued, this impacts the ability of investors to redeem their stablecoin for the underlying asset [15].

Despite these criticisms, stablecoins remain one of the more popular DeFi products and are even being used in countries where their fiat-based currencies are losing value, e.g. in Brazil where hyperinflation, poor economic factors and a host of other issues, has caused a crash in the value of the Brazilian Real [16]. Now, most of its citizens are using Tether Coin, a stablecoin pegged to the Dollar, to carry out transactions and have more stable savings [17].

Borrowing & Lending

Another popular use of DeFi is borrowing and lending of assets or money. There are two variations of the loan products, either 'Peer-to-Peer', meaning a situation where a borrower borrows directly from a specific lender, or 'Pool-Based', where lenders provide funds to a pool managed by the Dapp that borrowers can borrow from (this is the most common variant) [18].

[13] "NGNT by Token Mint" by Zino for Buycoins Africa, accessed 3 June 2021. http://help.buycoins.africa/article/us2z1f3p68-ngnt-by-token-mint.
[14] "Why Some Stablecoins Are Dangerous" by Market Mad House on ALTCOIN MAGAZINE, accessed 3 June 2021. https://medium.com/the-capital/why-stablecoins-are-dangerous-and-are-swiss-franc-stablecoins-safe-d2b971eba8e4.
[15] "Stablecoins: Understanding Counterparty Risk" by Team Gemini, accessed 3 June 2021. https://www.gemini.com/blog/stablecoins-understanding-counterparty-risk.
[16] "Exchange rate imbalance between the Brazilian real and the dollar will persist in 2021, say analysts" by Latin America Business Stories, accessed 3 June 2021. https://labsnews.com/en/articles/economy/exchange-rate-imbalance-between-the-brazilian-real-and-the-dollar-will-persist-in-2021-say-analysts/.
[17] "Brazil's Ailing Economy Is Helping Dollar-Pegged Stablecoins Find Traction" by Leigh Cuen for Coindesk, accessed 3 June 2021. https://www.coindesk.com/brazil-real-usd-stablecoin-growth-usdt-dai-busd.
[18] "Decentralized finance (DeFi)"by Ethereum.org, accessed 2 June 2021. https://ethereum.org/en/defi/#what-is-defi.

One of the perks on the borrower's side when considering a DeFi loan is that there is little to no due diligence or credit checks like you would have when accessing a loan from a traditional financial institution like a bank.

The Decentralised lending works without either party having to identify themselves and there are typically no credit checks or investigations into whether the debt profile of a borrower will deter the lender from giving out the loan [19]. So how do the loans work? As mentioned above, Pool-Based loans are the most common variant of DeFi loans because of the incentive it offers to its users.

Simply, a typical Pool-Based loan works by users pooling their assets or cryptocurrency and distributing to borrowers according to the terms of the loan written into the Smart Contract. Typical loan terms written into the Smart Contract include:

- ***Principal repayments and Interest payments*** **-** the underlying Smart Contracts of these loan pools are programmed to distribute the principal deposited plus the interest to each investor [20].

After the agreed term of the loan, the DeFi lending platform is instructed by the Smart Contract to deduct the principal sum and interest from the borrower's cryptocurrency wallets that have been linked to the Dapp (typically one of the conditions precedent to disbursement). The principal repayment and interest payment will then be shared to the lenders by the Dapp pro-rata their contribution to the pool [21].

Security

– the Smart Contract will require a collateral deposit by the borrower and this collateral may either be required to have more value than the cryptocurrency being granted as a loan from the pool or may be equal to the value of the assets they intend to borrow [22]. Collateral may take the form of cryptocurrency or fiat currency, subject to the terms of the Smart Contract.

[19] "Decentralized finance (DeFi)"by Ethereum.org, accessed 2 June 2021. https://ethereum.org/en/defi/#what-is-defi.
[20] "What are Defi Loans?" by Matt Hussey for Decrypt, accessed 2 June 2021. https://decrypt.co/resources/what-are-defi-loans-ethereum-maker-aave-explained-learn.
[21] "DeFi Loans" by DeFi Rate, accessed 23 June 2021. https://defirate.com/loan/.
"HOW DOES DEFI LENDING WORK?" by Akash Takyar for LeewayHertz, accessed 23 Jun 2021. https://www.leewayhertz.com/how-defi-lending-works/.
[22] ibid.

. In the event of default by the borrower, the collateral will be available for use to remedy the default [23]. ·Borrowers can access DeFi loan platforms by simply visiting any DeFi platform that offers loans. Potential borrowers are advised to read through the Terms and Conditions and the collateral requirements before applying for the loan.

In addition, where the collateral is a cryptocurrency, one of the terms set include that where the market value of the cryptocurrency drops below a certain price point set by the pool, it will be liquidated and shared among the individuals that deposited into the pool and the borrower may keep the borrowed asset as a result.

So for example, if you want to take a loan of 1 BTC from a pool, you have to deposit the cash equivalent of 1BTC or another cryptocurrency or asset as collateral into a cryptocurrency wallet and link it to the DeFi platform built on the same blockchain technology as the Smart Contract [24].

Once the collateral is deposited, the borrower receives 1 BTC and after a few months in accordance with the terms of the Smart Contract, the borrower returns the 1BTC with interest and then the Smart Contract releases the collateral to the borrower. The interest is shared among the investors and the loan transaction has ended. On the other end, where the borrower defaults on its payment obligations, the collateral deposited in the vault – the equivalent of 1 BTC – is released and used to remedy the default – also executed automatically by the Smart Contract.

One distinct attraction of DeFi is limited obligations imposed on the borrower, as may be gleaned from the above. For example, there are no obligations limiting the borrower from accessing further loans as you would find in traditional loans with banks, there are no required financial covenants to be maintained by corporate borrowers nor are their clauses limiting its business such as material change and change of control clauses.

[23] Ibid.
[24] "DeFi Loans" by DeFi Rate, accessed 23 June 2021. https://defirate.com/loan/.

DeFi loans are also experimenting with a concept called **'Flash Loans**'. Flash loans work on the basis that the loan is taken out and paid back in the same transaction [25]. Creators of flash loans highlight how the cryptocurrency borrowed may be sold on an exchange or platform that has attached a higher price to it so that the borrower of the flash loan makes an instant profit. If the loan cannot be paid back within minutes, the funds revertto the lender or pool. For example, if Mr A gets 1 ETH from a pool that values it at USD$200 (Two Hundred Dollars) and sells it on an exchange for USD$220 (Two Hundred and Twenty Dollars) or trades the asset on a P2P Platform for USD$220, Mr A makes a $20 profit and can pay back the value of the loan (USD$200) to the pool, or can buy 1ETH at USD$200 and give it back to the pool. If the transaction is not completed within the short time frame, it fails [26]. To curtail the risk of the flash loan failing within the short time frame, the cryptocurrency usually stays in the lenders wallet until the borrower has completed the terms of the flash loan.

There is no collateral deposited during a flash loan transaction and flash loan enthusiasts hope that it can be developed to have more use casesfor short sellers and arbitrage traders [27].

Yield Farming

One of the criticisms of cryptocurrency as an investment class is that it does not yield interest as it sits in a wallet. However, the soaring prices of cryptocurrency meant holders were not particularly bothered about this. That was until the 'Dip' happened [28]. With Bitcoin crashing from an all-time high of USD$65,000 (Sixty-Five Thousand Dollars) to USD$37,000 (Thirty-Seven Thousand Dollars), and other coins following suit (Ethereum dipped by half of its market price), traders and holders of cryptocurrency are looking to hedge against the volatility of cryptocurrencies and gain interest on their investment while holding their cryptocurrencies despite the price movements ('**Hodling**' as popularly termed).
DeFi products are offering them an opportunity for passive returns on their assets through yields - "Yield Farming" [29].

[25] "Decentralized finance (DeFi)"by Ethereum.org, accessed 2 June 2021. https://ethereum.org/en/defi/#what-is-defi.
[26] "Decentralized finance (DeFi)"by Ethereum.org, accessed 2 June 2021. https://ethereum.org/en/defi/#what-is-defi.
[27]Aave Protocol, Accessed 2 June 2021 https://aave.com/flash-loans/.
[28] "Crypto Price Crash: Why Ethereum Could Soon Overtake Bitcoin" by Billy Bambrough for Forbes, accessed 2 June 2021. https://www.forbes.com/sites/billybambrough/2021/05/31/crypto-price-crash-why-ethereum-could-eventually-overtake-bitcoin/?sh=4140752f13e3.
[29] "What Happens When Cryptocurrencies Earn Interest?" by Marco Di Maggio, Nicholas Platias, Wenyao Sha, and Nicolas Andreoulis for Harvard Business Review, accessed 2 June 2021. https://hbr.org/2021/02/what-happens-when-cryptocurrencies-earn-interest.

By depositing stablecoins (defined below) into a pool administered by the Dapp, investors will be rewarded for their deposits with annual returns called **Annual Percentage Yields** ("APY") [30]. Another interesting factor to Yield Farming is that in addition to the expected APY, some DeFi protocols offer a new Token as an additional incentive [31]. If the new token received by the investors begins to gain traction in the market, they can sell it and make more profit.

As peculiar as it sounds, the incentive creates a positive growth loop for the DeFi protocols and its investors. Getting more people to use the protocol will increase the value of the native token the protocol offers, and investors may be attracted to use the protocol and "farm" to get the token.

However, Yield Farming has been criticised by stakeholders as a "pump-and-dump" scheme as the coins can easily lose their value if people decide to stop using the DeFi protocol it is attached to.

[30] "Annual Percentage Yield (APY)" by James Chen, reviewed by Margaret James for Investopedia, accessed 2 June 2021. https://www.investopedia.com/terms/a/apy.asp.
[31] "What Happens When Cryptocurrencies Earn Interest?" by Marco Di Maggio, Nicholas Platias, Wenyao Sha, and Nicolas Andreoulis for Harvard Business Review, accessed 2 June 2021. https://hbr.org/2021/02/what-happens-when-cryptocurrencies-earn-interest.
[32] "What's 'Yield Farming'? (And How Do You Grow Crypto?)" by The Washington Post, accessed 2 June 2021. https://www.washingtonpost.com/business/whats-yield-farming-and-how-do-you-grow-crypto/2020/07/25/b0fc4662-ce5d-11ea-99b0-8426e26d203b_story.html.
[33] "Decentralized Finance Is Building A New Financial System" by E Napoletano and John Schmidt for Forbes Advisor, accessed 3 June 2021. https://www.forbes.com/advisor/investing/defi-decentralized-finance/.

There is also a possibility that Whales can use it to manipulate the price of the tokens they own by lending some to a pool and then using another account to borrow the cryptocurrency, artificially driving up demand, which will in turn affect the price of the token [32].

The Good, the Bad and the Ugly of Decentralised Finance

Since the global financial crisis of 2007/2008 where investors were left with investments that had lost significant value and rising debt, faith in traditional financial institutions have been shaken. Citizens of countries with declining economies, like Venezuela and Zimbabwe also hold their monetary authorities responsible for the monetary policies they have implemented which they believe are not economically viable. These are one of the many reasons why cryptocurrency enthusiasts and retail investors believe decentralised finance is the future of finance by decentring central authorities such as central banks and middlemen such as banks and other financial institutions, and empowering everyday people via peer-to-peer exchanges [33].

Advantages of Decentralised Finance

Some of the advantages include:

Speed:

DeFi protocols and products are processed quickly; for example, loan requests are processed timeously considering the promptness of blockchain-based transactions. This is in contrast to bank loans which may take days or even weeks for approval.

Accessible and permissionless:

DeFi products offered on blockchain technology fosters access to finance as users are not limited by location or credit history. Retail investors can access financial products or services through DeFi, provided they meet the terms of the Smart Contract. There are also no limits on the value that may be available users as opposed to traditional financial institutions who are subject to regulatory limits.

For example, the Banks and Other Financial Institutions Act 2020 provides that a commercial bank cannot, without the prior written approval of the Central Bank of Nigeria ("CBN"), grant to any person any loan or credit facility such that the total value of the liability in respect of that person exceeds 20% of the bank's shareholders' funds unimpaired by losses.

Transparency:

blockchain transactions are transparent as you can trace the wallet IDs of contract parties, and execution and completion time of transactions are recorded on the network. In addition, transactions conducted on them are permanent and cannot be altered. Once a financial transaction or Smart Contract has been recorded onto a blockchain, its terms are visible to participants on the blockchain network and become immutable. This creates some form of security with DeFi financial products as assets or transaction records cannot be altered or fraudulently manipulated [34].

[34]"Decentralised Finance" by Bird & Bird, accessed 3 June 2021. https://www.twobirds.com/~/media/pdfs/in-focus/blockchain/blockchain-defi-briefing-note.pdf.

In addition, as the terms of the Smart Contract are written as codes on the blockchain, this limits disputes on interpretation of contract terms.

As seen above, DeFi has great benefits but there are also inherent risks.

Disadvantages of Decentralised Finance

Hackers:

Hackers are a major security risk for a blockchain technology network. While it is hard to hack blockchain technology, it is not impossible. Since 2011, over USD$11,000,000,000 (Eleven Billion Dollars) worth of cryptocurrency has been stolen [35] from crypto wallets that were hacked [36]

Strict Terms:

the financial terms of Smart Contracts are typically stringent as a scale against the limited requirements. Take De-Fi loans where the collateral required is typically set to be equal in value (or more) to the loan requested.

Such stringent financial terms are limiting with respect to persons who can realistically access the DeFi products [37].

Fakes:

There have been instances where scammers have used popular Dapps to list fake cryptocurrencies labelled as tokens that can be used to access DeFi protocols [38]. Investors have to be careful in choosing the digital assets they decide to invest in and retail investors may not appreciate the due diligence required.

Investor Protection:

DeFi services, products, and technology, are by their very nature, typically outside regulatory oversight. Thus, the investor protection provisions that regulated financial institutions are subject to may not apply to Dapps, DeFi protocols or issuers. Without these investor protection requirements, consumers and their investments are subject to the whims of the issuers of these financial products.

[35] "Hackers have got their hands on $11 billion in stolen cryptocurrency since 2011" by Stephanie Palmer-Derrien for SmartCompany, accessed 3 June 2021. https://www.smartcompany.com.au/startupsmart/news/hackers-11-billion-cryptocurrency/.
[36] "Once hailed as unhackable, blockchains are now getting hacked" by Mike Orcutt for MIT Technology Review, accessed 3 June 2021. https://www.technologyreview.com/2019/02/19/239592/once-hailed-as-unhackable-blockchains-are-now-getting-hacked/.
[37] "Decentralized Finance Is Building A New Financial System" by E Napoletano and John Schmidt for Forbes Advisor, accessed 3 June 2021. https://www.forbes.com/advisor/investing/defi-decentralized-finance/.
[38] "What is Decentralized Finance (DeFi)?" by On Yavin for City A.M, accessed 2 June 2021. https://www.cityam.com/what-is-decentralized-finance-defi/.

As highlighted earlier, there is a conspicuous counterparty risk with De-Fi products. For example, if an issuer pulls the plug on a Dapp or blockchain technology, that could put investors funds or any collateral that have been deposited in peril.

There are definite pros and cons to De-Fi that requires serious consideration for anyone looking to explore De-Fi products or services. Cryptocurrency enthusiasts are ever optimistic of decentralised finance as the future of finance in terms of the delivery of financial products and services and the different innovative solutions that may result from block chain technology.

Is Decentralised Finance the Future of Finance?

According to Benedikt Christian Eikmanns *(Senior Consultant at the strategy consultancy Roland Berger and doctoral candidate (PhD) at the Technical University of Munich), Prof. Dr. Isabell Welpe, (full professor (W3) at the Technical University of Munich, head of the Chair for Strategy and Organization, co-founder of the TUM blockchain center), and Prof. Dr. Philipp Sandner (founder of the Frankfurt School Blockchain Center (FSBC));*
"For the first time in history, a financial system is developing without intermediaries at a large scale. So far, DeFi applications cannot compete in terms of security, speed, and ease of use with traditional finance solutions yet. But DeFi has produced real, working applications that have already managed to attract billions of capital. Those resources will be used to develop more competitive and user-friendly applications in the future [39]".

This is a succinct view of the widely held position on the future of DeFi – the future is bright! In Nigeria today, platforms like Xend Finance are leveraging on DeFi to offer financial products to credit unions, trade unions and individuals. Credit unions provide capital and invest on the Xend Finance platform. The unions are given the $XEND token to hold and their capital is invested in other DeFi pools. At the end of the savings period, the returns on their investment is given to a member of the credit union for that month or period [40].

[39] "Decentralized Finance Will Change Your Understanding Of Financial Systems" by Benedikt Christian Eikmanns, Prof. Dr. Isabell Welpe, and Prof. Dr. Philipp Sandner, for Forbes, accessed 3 June 2021. https://www.forbes.com/sites/philippsandner/2021/02/22/decentralized-finance-will-change-your-understanding-of-financial-systems/?sh=175575d25b52.
[40] Xend Finance, ver 1.1. Xend Finance Litepaper The first DeFi Credit Union on Binance Smart Chain. https://xend.finance/XendFinanceLitePaper.pdf.

In terms of the future of DeFi in Nigeria, it is important to recognise that there are currently discordant approaches from regulators in the financial sector regarding cryptocurrency, which may impact the ease of operating Dapps and accessing DeFi products. On the one hand, the CBN has prohibited banks and other financial institutions from dealing in cryptocurrency and providing payment services to cryptocurrency exchanges and further directed financial institutions to close the accounts of customers who operate cryptocurrency exchanges within their system. On the other hand, Nigeria's Securities and Exchange Commission ("SEC") in 2020, released its 'Statement on Digital Assets, their Classification and Treatment', which set out how SEC would regulate crypto assets - signifying SEC's acceptance of cryptocurrency. While exchanges have found a work around these regulatory limits by facilitating peer-to-peer trades, these fragmented approach by the Nigerian regulators may leave investors wary of investing funds in a finance product whose infrastructure is based on blockchain and cryptocurrency.

Though DeFi is still a developing area of finance, one cannot underestimate its attractiveness to investors, whether institutional, high-net worth or retail, especially with respect to the different innovative solutions on offer. We also opine that it will be complementary to traditional financial services as innovation challenges the way traditional banks and financial institutions operate and offer their services.

As more money is being invested into the development of Dapps and De-Fi protocols, DeFi will become more efficient, easier to use and offer various iterations of financial products which will financially assist individuals and even countries. The future of finance is decentralised and DeFi will only continue to grow.

[39] "Decentralized Finance Will Change Your Understanding Of Financial Systems" by Benedikt Christian Eikmanns, Prof. Dr. Isabell Welpe, and Prof. Dr. Philipp Sandner, for Forbes, accessed 3 June 2021. https://www.forbes.com/sites/philippsandner/2021/02/22/decentralized-finance-will-change-your-understanding-of-financial-systems/?sh=175575d25b52.
[40] Xend Finance, ver 1.1. Xend Finance Litepaper The first DeFi Credit Union on Binance Smart Chain. https://xend.finance/XendFinanceLitePaper.pdf.

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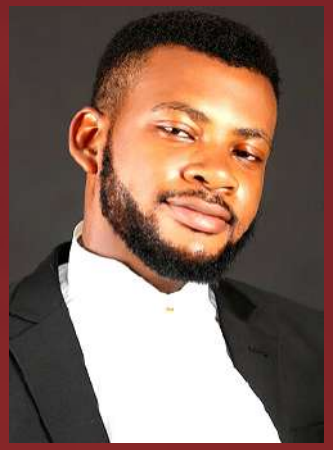

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INVESTING IN MARGINAL FIELDS - KEY CONSIDERATIONS FOR FINANCIERS

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Introduction

It is no longer news that the winners of the '2021 Marginal Field' bid round (hereinafter referred to as grantee(s)) have emerged. As grantees and potential financiers contemplate how to raise capital and the means of raising capital for the development of each field, they also need to consider certain issues that arise from the marginal field award process and other peculiarities of a marginal field.

Any bid for a government asset in Nigeria is keenly contested. Such bids attract a long list of bidders, including skilled commercial and technical operators and others who know little about the asset to be sold or the sector within which the asset operates. The 2021 Marginal Field bid round is no different. The fact that the assets being considered for sale are oil and gas assets has further intensified the competition, which is characteristic of the sale of a public energy asset in Nigeria.

It was, therefore, not surprising that upon the invitation by Department of Petroleum Resources ("DPR") for submission of Expression of Intent ("EoIs"), hundreds of aspiring companies responded. At the end of the bidding process, the DPR awarded 57 marginal field assets to 161 companies by grouping together different bidders as winners of specific marginal field assets [1].

The manner of the award of the marginal fields, by DPR, with its amalgamation of bidders for some assets, throw up unique issues and challenges that the grantees and their potential investors must consider. This article discusses the items/issues that parties need to consider when seeking or contemplating investing in the new marginal fields.

THE INTEGRITY OF THE BID PROCESS

The Marginal Fields Bid Round Portal published the bid process as consisting of nine steps beginning with registration and pre-qualification and ending in the execution of a farm-out agreement between the leaseholder and the grantee. The DPR published Guidelines for The Award and Operations of Marginal Fields in Nigeria ("the Guidelines") [2] to guide the process. The Guidelines, amongst other things, contained extensive provisions on the award process and the criteria for evaluation and selection of the winning bids. The principles that undergird the award process are (i) that prequalified bidders must bid for specific fields, (ii) that each bid is separate and would succeed or fail on its own account.

The first principle can be gleaned from Paragraph 5.3 of the Guidelines, which required bidders to pay fees announced by the DPR for activities which includes data prying, data leasing, competent persons report and fields specific reports.

[1] See Marginal Oilfields: Bid Winners Paying Signature Bonuses – Sylva – Department of Petroleum Resources (dpr.gov.ng)
[2] Published by the DPR In 2020, available at https://www.dpr.gov.ng/wp-content/uploads/2020/08/Guidelines-for-the-Award-and-Operations-of-Marginal-Fields-in-Nigeria.pdf

The applicable fees for these activities are published in the appendix to the Guidelines. The items that bidders paid for, provide the bidders with the required information that would assist each bidder in deciding on the specific field to bid for, the bid price for that specific field, the signature fees for that specific field, etc. In addition, Paragraph 5.4.7 of the Guidelines requires each bidder to indicate in its bid the specific field or fields it is interested in. Thus, a fundamental assumption underlying the bid process is that bidders would submit bids for specific marginal field(s).

The second principle becomes obvious from Paragraph 6.3 of the Guidelines, which provides that the bid round will be based on competitive participation by **interested companies** (emphasis mine). Since each bidder is required to submit a bid for a specific field, interested companies would be those companies that submitted a bid for the field. The competitive participation for a particular field would be expected to be amongst bidders who submitted bids for that field.

It appears that, the DPR, in the award of the marginal field assets, has adopted a different procedure from what was advertised under the Guidelines. Grantees and potential investors should, therefore, expect that there would be several bidders that will be aggrieved by the award process adopted by the DPR. Such aggrieved bidder(s) may challenge the award of a marginal field on the ground that the bid procedure as advertised to the bidders were not followed.

Critical questions that a court would need to answer, and which should be considered by all asset winners and investors, are (i) is the Guidelines a statutory instrument which stipulates a process that DPR is required to follow?; and (ii) does the Guidelines constitute a contract, or is it merely an offer to receive offers?

Is the Guidelines a statutory instrument?

Section 9 of the Petroleum Act [3] gives the Minister of Petroleum the right to make regulations prescribing anything requiring to be prescribed for the purpose of the Act.

[3] Chapter. P10, Laws of the Federationof Nigeria, 2004

By virtue of Section 10 of the Nigerian National Petroleum Corporation Act [4] ("the NNPC Act"), the Minister has the power to delegate to the chief executive of the Inspectorate (which later transformed into the DPR) [5] those powers conferred on the Minister under the Petroleum Act (amongst other enactments). In addition, section 10 of the NNPC Act provides that any regulatory function conferred on the Minister of Petroleum, under any enactment (and this will include the power to issue regulations) is deemed to have been conferred upon and may be discharged by the chief executive of the Inspectorate (i.e. the Director DPR) [6].

From the foregoing, it is evident that the director of the DPR has, via statutory fiat, been delegated by the Minister to issue regulations including guidelines, standards, and procedure guides for purposes of the Petroleum Act.

'Regulations' is defined to mean "the act of regulating; a rule or order, having legal force, usually issued by an administrative agency; also termed agency regulation; subordinate legislation; delegated legislation" [7].

The inference drawn from the above definition is that regulations, where issued by an administrative agency that has been statutorily authorised to so issue, is a subordinate legislation having legal force. Consequently, the Guidelines issued by the DPR for the award and operations of marginal fields is a statutory instrument.

Since the Guidelines is a form of subsidiary legislation, it can be taken as a statutory instrument that has stipulated the procedure to be adopted by both the bidders and the DPR for the administration of the bid process. Thus if an aggrieved bidder can show that DPR has not followed its own Guidelines, it may be a ground to challenge and upturn the award of a marginal field.

Is the Guidelines a contract?

Another ground on which an aggrieved bidder may challenge the recent awards of marginal fields is that the Guidelines constitute a contract, that is, a process contract between each bidder and the DPR.

[4] Chapter N123. Laws of the Federal Republic of Nigeria 2004
[5] The Nigerian National Petroleum Corporation ("the NNPC")was re-organised in 1988: The Petroleum Inspectorate was removed from the NNPC, transferred to the Ministry of Petroleum Resources as the technical arm and renamed the DPR. See https://www.dpr.gov.ng/history-of-dpr/
[6] Supra note 5
[7] Henry Campbell Black, "Black's Law Dictionary", Black's Law Dictionary 9th Edition (West Group, 2009), Bryan A. Garner, editor, ISBN 0-314-19949-7

Although there is no decided matter on the nature of a Request for Proposal (RfP) or EoI in Nigeria, the trend in many common law jurisdictions is that RfPs and EoIs do not constitute a contract [8]. They are considered an invitation to treat, an advertisement to receive offer, which will culminate in a contract when accepted by the principal [9].

However, there are several judicial decisions in many common law countries that, whilst affirming that an RfP/EoI is not a contract, have held that an RfP/EoI creates an underlying contract within the procurement process. This is referred to as a process contract. A process contract is an implied contract between the issuer of an RfP and the tenderer. The issuer commits to run a tender adhering to a specified process and to evaluate the bids using specified evaluation criteria.

In *Hughes Aircraft Systems International v Airservices Australia* [10], the party that issued a tender changed the advertised procedure for conducting the tender.

In that case, the court decided that the party that issued the tender breached a process contract and that the aggrieved party was entitled to both damages and equitable remedies. The basis of the court's decision was, amongst others, that the tender document established a legally binding process between the principal and each tenderer and that the principal ought to follow the process and act in good faith.

Courts in other common law countries have made similar decisions. In Pratt Contractors Ltd v Palmerston North City Council, [11] the court held that an issuer breached the requirement to accept the lowest conforming tender, while in *Onyx Group Ltd v Auckland City Council* [12].

the court held that the issuer breached an implied term that tenders would be assessed on a fair and even-handed basis. The rationale adopted in deciding that an RfP/EoI may constitute a process contract may persuade Nigerian courts to reach a similar decision [13]

[8] Shivas & Westmark Investments Ltd v BTR Nylex Holdings NZ Limited & Ors [1997] 1 NZLR 318 (HC)
[9] This is in line with the principle enunciated by
[10] [1997] 76 FCR 151
[11] [1995] I NZLR 469
[12] [2003] 11 TCLR 40
[13] Ibid

THE PROMOTERS

It will be necessary for financiers to assess who the promoters are to understand the level of their commitment to the development of the field. The background and track of the promoters are essential in making this judgement. This task will be a complicated one for parties interested in investing in the newly awarded marginal bids. The reason is that during the bidding stage, several bids were submitted by a consortium of sponsors. Members of each bidding consortium had sorted how they will manage and fund the operation of specified fields if they succeed. However, the amalgamation of competing and, sometimes, non-competing bidders as winners of a marginal field may have complicated the carefully designed arrangements that each bidding consortium had.

If winners decide to move ahead under the composite structure imposed by the DPR, the different promoters must work on a new arrangement. They may also need to form a new joint venture.

This may necessitate negotiating new shareholders or unincorporated joint venture agreements. In some cases, both may be necessary. It is therefore crucial for lenders and investors to understand the corporate structure of the grantees, the contractual dynamics between the different promoters of the grantees, the structure of their different constituent companies and their different cultures. Investors and lenders will also need to understand the strategy that would be utilised to ensure that the different sponsors are able to work amicably to operate the marginal fields peacefully and profitably.

Another important issue for investors and lenders is the question about who the promoters are. Investors and lenders would be concerned about the credibility andpedigree of the persons behind the grantee company. In cases where some of the promoters are politically exposed persons, the lenders and the investors may need to conduct extra due diligence to understand the sources of their funds.

[8] Shivas & Westmark Investments Ltd v BTR Nylex Holdings NZ Limited & Ors [1997] 1 NZLR 318 (HC)
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[13] Ibid

CORPORATE GOVERNANCE

Again, the amalgamation of bidders as winners raises the importance of corporate governance of the grantee company or the unincorporated joint venture set up for the operation of the marginal field. Lenders and investors need to take a close look at the structures and the processes that the promoters have developed to control the grantee company and, in the case of an unincorporated JV, for the conduct of petroleum operations. In order to attract investors and/or make the project company attractive to lenders, it is imperative that the promoters carefully craft the relationships amongst all the stakeholders (the management, the board, the shareholders (majority and minority)) in a manner that would be adjudged fair and equitable. This may help ensure that the grantee company remains feasible and sustainable. The structure of the grantee boards and the stature of the persons constituting the said board are also issues the lenders and investors should pay close attention to.

Thus, the grantees should be willing to appoint persons with demonstrable track records and good ethics to their boards.

The management team should be carefully scrutinised by lenders/investors. They would need to ascertain that the grantee has a team that consists of persons with technical, financial, and commercial expertise. It will be a plus for the grantee to demonstrate that it has a team that knows how to achieve production with minimal costs. A grantee with a cohesive team with a history of working together will be a positive signal to lenders and investors.

THE QUALITY OF THE ASSET

By its nature, a marginal field in Nigeria is one that has been left unattended for not less than ten years after it has been discovered [14]. A key reason such fields are left unattended is that the licence holder did not, for several reasons, consider the fields to be economically viable. Lenders and investors are aware that the mere fact that marginal field licence has been granted for such field will not change the economic viability of such field.

[14] See pg 8 of the guidelines

For such a field to be considered an asset that would attract debt or equity, the grantee must improve the quality and economics of the asset.

The grantee needs to demonstrate to lenders and investors that the asset has sufficient reserves to guarantee attractive upsides, notwithstanding the prevailing fiscal and market terms. It will be important to show that the field is connected to critical infrastructure for crude evacuation. It will be a bonus if the grantee can provide other viable alternative evacuation outlets that will come in handy if the primary evacuation infrastructure fails. Lenders usually require evacuation options in view of the losses that operators typically suffer, such as losses during crude transportation and handling by third parties. A viable alternative evacuation option will also help allay the fears of lenders and investors over production shut-downs, occasioned by frequent force majeure occurrences on crude handling infrastructures.

Where the marginal field has associated gas, the grantee needs to provide a convincing and bankable gas development and utilisation plan. The zero-flare policy of the government will mean that a new marginal field with associated gas may not be produced without a gas utilisation plan. Also, a detailed and comprehensive environmental, safety and health management plan/system will need to be developed, not only for compliance purposes but also for improving the quality and attractiveness of the marginal field.

In view of the current global energy transition, it is crucial for the grantee to develop an excellent strategy to convince sceptical investors or lenders on the long-term viability and profitability of the asset. Lenders and investors would like to know how the marginal field grantee will adapt to changing policies around the world and its plan to evolve in a way that would continue to make the company profitable.

Above all, the grantee needs to show that it can minimise operational and technical costs whilst deploying an operating model that accelerates recovery and converts production in the tank into profit in the bank.

OTHER COMMERCIAL CONSIDERATIONS

The profitability of the marginal field will form a significant concern for the investors. Given the report that the Federal Government of Nigeria intends to generate US$500million from signature bonus [15] payable by the grantees, it is necessary that a grantee seeking loan and/or equity investment demonstrates the profitability of the fields. Investors and lenders would expect the grantees to show that the field will be profitable despite the low reserves of marginal fields, low oil price, subsurface uncertainties, and technological constraints.

LOAN SECURITY

The lenders will require that the grantee arranges robust security for the loans. Loans for petroleum asset acquisition and development are usually structured as pre-export loans [16]

In this respect, the primary source of repayment is the revenue generated from the sale of oil and gas produced from the asset. As expected, under pre-export loans, the revenue generated by the asset would be charged in favour of the lenders. However, in addition to creating a charge on the revenue, elements of corporate finance are introduced, such as the creation of charges over the shares of sponsors and the requirement of providing corporate and personal guarantees of the sponsors.

Lenders will need to satisfy themselves as to the effectiveness of creating charges over the marginal field licence and the shares. There is the often recurring issue about the difficulty of enforcing the charges created over petroleum assets and shares of a petroleum company because of the requirement for Minister's consent at the point of enforcement of the security created. Hopefully, this issue would be resolved if section 95(5) of the Petroleum Industry Bill (PIB) is passed as proposed. The section allows for asset owners to charge their rights with the consent of the regulator.

[15] Report available at https://www.dpr.gov.ng/dpr-targets-500m-from-signature-bonuses-of-57-marginal-oilfields/
[16] Lexisnexis, "Pre-Export Finance and Pre-Payment Finance Overview" available at https://www.lexisnexis.com/uk/lexispsl/bankingandfinance/document/391289/5617-JTC1-F185-X3X6-00000-00/Pre_export_finance_and_prepayment_finance_overview

Whilst the passage of section 95 may resolve an age-long problem, banks will face another problem regarding charges created over shares. Section 20920 of the Banks and Other Financial Institution Act 2020 requires banks to obtain the consent of CBN before enforcing their rights over shares charged as security [17].

CONCLUSION

Marginal fields, by their very nature, have limited capacities to attract debts and equities. In view of the currency instability, currency exchange constraints and the existing exposures of Nigerian banks to the petroleum sector, fewer and fewer oil and gas deals are getting financed. The marginal field grantee needs to develop a robust strategy for obstacles and litigation that may arise as a result of the award process. It is also necessary for a marginal field grantee to carefully balance the different interplays between the size of the reserves, costs, oil price and the fiscal regime in order to build an operation that is optimally geared to support decent returns for investors and lenders.

[17] Section 20(2) BOFIA Act No. 5 2020

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