Leveraging Private Flows from Digital Technology to Finance SDGs in Africa: *E-Business Revenue Opportunities Amidst IFF Challenges*

The sixth session of the Africa Regional Forum on Sustainable Development seeks to "Deliver a Transformed and Prosperous Africa through the 2030 Agenda and Agenda 2063". The forum seeks to explore, gain insights into, share and agree on collective regional efforts toward accelerating the implementation of these agendas. This policy brief supports targeted steps toward leveraging private flows from the digitalisation of the economy to achieve the goals of the agendas within the set time frame. It also cautions against the potential of digitalisation to enable illicit financial flows, if left unregulated. This policy brief presents specific discussions and action points to be considered at the forum.

Introduction

The 2030 Agenda for Sustainable Development adopted by the UN General Assembly in September 2015 set out 17 broad goals to be addressed through meeting 169 individual targets by 2030. This global action agenda provides a coherent integration of diverse development issues, notably no poverty, zero hunger, good health and wellbeing, quality education, gender equality, industry, innovation and infrastructure. It elevates sustainability to the forefront of the global agenda, a recognition that a lack of progress on one goal can threaten to undermine progress in all other areas of human development. The Sustainable Development Goals (SDGs) are reflected in the Pan-African vision set out in the Africa Union Agenda 2063: The Africa We Want. They also map neatly onto the 7 aspirations identified in the Agenda. Such interrelationship between the SDGs and Agenda 2063 is based on their response to develop new solutions to humanity's critical problems, to improve how the world is governed now and, in the future, and to enhance the quality of people's lives.

The two agendas, one for the world (the SDGs) and the other for Africa (Agenda 2063) set out the common vision for the continent's economic, social, legal and political development. Their implementation will require a comprehensive approach to mobilising sufficient finances, which currently present the most fundamental challenge. While the financing gap to achieve the SDGs in developing countries is estimated to be around US$2.5 - 3 trillion per year,[1] the Agenda 2063 Financing and Resource Mobilisation Strategy (RMS) does not provide such approximate estimates.[2] The RMS instead suggests that 75-90% of domestic resource mobilisation (DRM) will be channelled to finance Agenda 2063. Relatedly, the United Nations (UN) also recommends boosting domestic resource mobilisation efforts to increase financing for SDGs.[3] Both agendas underline the need to strengthen global partnership for sustainable development by combatting corruption and curbing illicit financial flows (IFF) as measures to increase DRM.

There is no shortage of financing that can be made available given the size, scale and level of sophistication of the global financial system. The available finance, however, is not being channelled toward sustainable development at the scale and speed required to achieve the SDGs and support Agenda 2063. In 2019, the gross world product was estimated at over US$86.60 trillion[4] and total global wealth reached US$360.6 trillion, out of which US$4.1 trillion reflected Africa's minimal share.[5] The financial sector is in a central position to influence the agendas, not only through the reorganisation of the global financial practices to generate funds for sustainable development, but also through strategically leveraging private flows from digital technologies. Digitalisation has unlocked new sources of finance, both 'bottom up' and by better matching investors with sustainable investment opportunities. Particularly related to greater financial inclusion and innovation is the opportunity FinTech has presented for Africa. Can FinTech and the digitalisation of the economy be harnessed to achieve SDGs and Agenda 2063?

[1] United Nations Secretary General's *Roadmap for Financing the 2030 Agenda for Sustainable Development*, 2019-2030, Available at: https://www.un.org/sustainabledevelopment/wp-content/uploads/2019/07/UN-SG-Roadmap-Financing-the-SDGs-July-2019.pdf (Accessed February 2020); UNCTAD, *SDG Investment Trends Monitor* (2019), Available at: https://unctad.org/en/PublicationsLibrary/diaemisc2019d4_en.pdf (Accessed February 2020).

[2] The Africa Union Commission, 'A Shared Strategic Framework for Inclusive Growth and Sustainable Development, First Ten-Year Implementation Plan 2014-2023,' (2015). Available at: https://www.un.org/en/africa/osaa/pdf/au/agenda2063-first10yearimplementation.pdf (Accessed February 2020); The Africa Union Commission, 'Financing Agenda 2063 First 10 Year Plan, AU Key Documents 08 available at: https://au.int/en/documents/20141012/key-documents-agenda2063 (Accessed February 2020).

Leveraging Digitalisation to Finance SDGs

The use of digital technology for the provision of financial services (FinTech) has changed the way Africans store, save, borrow, invest, move, and spend money.[6] This follows from the transformation of the structure of the financial industry in Africa that is heavily inclined toward the provision of mobile money accounts, to the creation of applications through which access to credit, cross border transfers, remittances and issuance of digital currency is facilitated.[7] Sub-Saharan Africa, according to the IMF, is the only region in the world where close to 10% of GDP in transactions occur through mobile money.[8] Mobile phones and the internet have created these new opportunities for 765 million sub-Saharan Africans to use as payment, lending and remittances platforms.[9] Gallup data collected by McKinsey & Company in 2014 on 44 nations in sub-Saharan Africa showed that an average of 54% of adults utilised FinTech to make payments at approximately US$5 billion transactions annually.[10] The total volume of these flows was estimated at US$760 billion (of which 50-60% of the transactions were in cash). If a conservative estimate of revenues at 2% of volume is applied, it would result in annual revenues of about US$6.6 billion from digital payments alone.

The African continent is now home to approximately 491 FinTech start-ups[11] which has become the most popular sector among investors attracting 39.7% of total funds that are raised in the continent.[12] In 2018, 200 out of these 491 African-based FinTech start-ups raised US$334.5 million towards investments;[13] demonstrating that the correlation between digital technologies and revenue mobilisation is quite strong and can therefore, be leveraged to implement SDGs. To complement this claim, statistics provided by Mauritius Africa FinTech Hub in 2019 suggest that FinTech is set to grow to US$3 billion from US$ 200 million in sub-Saharan Africa by 2020.[14] Further, in 2015, the Financial Sector Deepening Africa Report presented statistics revealing that peer to peer (P2P) business lending in Africa accounted for US$16 million, donation-based crowdfunding generated US$31.4 million in revenue, equity based crowdfunding totalled US$4 million and reward based crowdfunding generated US$8.5 million.[15] Such financial acceleration is justified from the fact that 52% of the world's mobile transactions take place to and from Africa and 58% of the world's mobile money accounts are registered in sub-Saharan Africa.[16]

Furthermore, the digitalisation of the economy has resulted in delivering services online through new digital business models, such as subscription based, ad-supported, freemium, and e-commerce. It has helped businesses to reach previously inaccessible rural and underdeveloped areas. Digital interaction has also enabled businesses reach customers globally resulting in increased revenues from sales and services. In 2019, Netflix, a subscription-based model accessible in Africa generated a total global revenue of approximately US$5.5 billion,[17] while the ad-supported YouTube company also accessible in Africa earned US$15.1 billion from ad revenue globally.[18] The African online gaming industry which is based on the freemium model is estimated to be worth US$174 billion,[19] while earnings from the e-commerce model are projected to generate US$29billion for Africa.[20] These statistics are indicative of the potential in finance to strategically unlock, leverage, and catalyse private flows and domestic resources towards financing SDGs and Agenda 2063 in Africa. Digitalisation, therefore, can change how African states choose to implement and most importantly, finance SDGs.

Opportunities and challenges: E-Business

New streams of revenue generation resulting from online or digital economic activities remain untapped and unapplied towards steering the financing of SDGs and Agenda 2063. There is a growing global consensus that the digitalisation of the economy is relatively undertaxed when compared with traditional businesses. Certain inherent characteristics such as reliance on cross border provision of services without physical presence, easy transfers of intangible assets, and novel ways to create value make it particularly easy for enterprises to limit their tax liabilities and sometimes utilise this forum to evade taxation. In order to provide a solution to this problem, African states should reform their corporate tax

[3] United Nations Secretary General's *Roadmap for Financing the 2030 Agenda for Sustainable Development*, 2019-2030, Available at: https://www.un.org/sustainabledevelopment/wp-content/uploads/2019/07/UN-SG-Roadmap-Financing-the-SDGs-July-2019.pdf (Accessed February 2020).

[4] Statistics Times, *Gross World Product, 2019*, available at: http://statisticstimes.com/economy/gross-world-product.php (Accessed February 2020).

[5] Credit Suisse, *Global wealth report 2019*, Available at: https://www.credit-suisse.com/media/assets/corporate/docs/about-us/research/publications/global-wealth-report-2019-en.pdf (Accessed February 2020)

[6] Lyla Latif, 'The Taxation of Financial Technology in Africa', (forthcoming) TJNA Working Paper Series.

[7] Ibid.

[8] IMF. 2019. "FinTech in Sub Saharan African Countries. A Game Changer?" No. 19/04. Available at: https://blogs.imf.org/2019/02/14/fintech-in-sub-saharan-africa-a-potential-game-changer/ (Accessed February 2020).

[9] https://mauritiusfintech.org/ (Accessed on February 2020).

[10] Kendall, Jake, Robert Schiff and Emmanuel Smadja, 'Sub-Saharan Africa: A major potential revenue opportunity for digital payments', McKinsey & Company (2014). Available at: https://www.mckinsey.com/industries/financial-services/our-insights/sub-saharan-africa-a-major-potential-revenue-opportunity-for-digital-payments (Accessed February 2020).

frameworks to align them with income-generating transactions within the digital economy. African states will have to reconsider the bilateral treaties signed with countries whose companies have a digital presence in African markets, for example Jumia, Airbnb and Uber, which do not recognize digital presence as a permanent establishment to trigger taxation, regardless of the political negotiations on imposing digital tax, taking place at the OECD and the UN Tax Committee.

Online platforms providing services to users in the form of contacting independent taxi service providers and decentralized financial transactions or money transfers, without physical presence have created a mismatch between tax rules and digitalisation. This has resulted in African states losing revenue and an economic presence. It has resulted in political differences on the question of which state is to tax income earned through the digitalisation of the economy. Although academics, civil societies and governments are addressing the challenges of taxing the digital economy, there has been little systematic description on what policy recommendations ought to be made that would provide an effective template for developing African countries to rely on in enacting their own laws.

At both the global and domestic level, imposing the digital tax is top on the agenda of governments. However, efforts towards unilateral measures have been curbed on the understanding that a unified approach outlined in the OECD/G20's Inclusive Framework on Base Erosion and Profit Shifting (BEPS) Action Plan for imposing the digital tax may prove more beneficial to allow states to adapt and expand their taxing rights by considering the new digital business models.[21] Digitalisation has thus challenged the concept of tax sovereignty, in essence raising domestic revenue. States from both the south and the north are re-examining and debating the extent to which they should cede control over their digital tax policies to achieve global economic efficiency in an interdependent world. How is Africa to capitalise on digital taxation to fund SDGs and Agenda 2063? The financing of SDGs and Agenda 2063 will affect domestic fiscal laws and policies. This in turn will recursively affect international relations, which will subsequently impact the implementation of the two agendas. The question that African governments must ask of themselves is how can the agendas order the imposition of transnational tax within a rapidly digitalizing world? The generation of tax revenue which also results from online business activities becomes critical to ensure economic prosperity for the state that has allowed its territory to be the source of global commerce. The key challenge, however, has been to raise this digital tax and align it towards funding SDGs and Agenda 2063.

Opportunities and challenges: Illicit Financial Flow (IFF)

How we interact with money has changed significantly following the advancement of FinTech. Technology has played an influential role in digitising global economies and expanding financial inclusion. The growth of peer-to-peer lending digital platforms, mobile money payments, smart contracts, and use of software that automatically facilitate transactions without human intervention continue to disrupt regulated traditional money markets and institutions globally. Even as these new business models are partly regulated, for example mobile money, they could potentially present additional risks related to the criminal aspect of illicit financial flows. Hence, weak or non-existing regulation concerning the digitalisation of finance can result in illegitimate markets that are attractive to money launderers, tax evaders and fraudsters.

Let us take the example of cryptocurrencies.[22] These are currencies that only exist online. Their value is based on speculation and existing demand. No country or central bank controls their supply or price. In other words, they are decentralised. Transactions involving cryptocurrencies are peer-to-peer with no bank or service as an intermediary. They can be used for speculation and as a method of payment for transactions both on the surface web[23] and the dark web,[24] in other words, licit as well as illicit transactions. Currently, the bitcoin is the de facto standard for

[11] The Finnovating for Africa. 2019." Reimagining the African financial services landscape report." Disrupt Africa.
[12] African Tech Start-Ups Funding Report. 2018. Disrupt Africa.
[13] African Tech Start-Ups Funding Report 2018. Disrupt Africa.
[14] https://mauritiusfintech.org/ (Accessed on February 2020).
[15] https://www.fsdafrica.org/
[16] https://mauritiusfintech.org/ (Accessed on February 2020).

[17] Amy Watson, 'Netflix's revenue Q1 2011-Q4 2019, *Statistica*, 2020. Available at: https://www.statista.com/statistics/273883/netflixs-quarterly-revenue/ (Accessed February 2020).
[18] Alphabet Announces Fourth Quarter and Fiscal Year 2019 Results. Alphabet Inc, 2020. Available from https://ppc.land/youtube-ad-revenue-reaches-15-billion-usd-in-2019/ (Accessed February 2020).
[19] Wasulu Habib Olawale, 'The opportunities for gaming in Africa', *INGRESSIVE*, August 27, 2019. https://www.ingressive.co/articles/2019/8/27/the-opportunities-for-gaming-in-africa

cryptocurrencies. A 2019 study found that 'approximately one-quarter of bitcoin users are involved in illegal activity,' and around '$76billion of illegal activity per year involves bitcoin'.[25] This is a clear indication of a digitalised symbiotic relationship between finance and the existing clandestine markets.

The anonymous nature of the internet and innovations in technology can provide criminals with multiple ways[26] to launder illegally acquired money through covert, anonymous, and even seemingly legitimate online transactions. For example, opening of several different accounts on various online games to move money; using job advertising sites to recruit money mules; or making payments using PayPal account based on virtual credit cards funded with a scammed bank account. Digitalisation can also enable the manipulation of systems intended to monitor and surveil business activities. For example, in the fishing industry, the law requires the vessels to install monitoring and data transmission devices so that illegal, unregulated and unreported fishing (IUU) is prevented. While the manipulation of such monitoring devices does not result in real time transfer of illicit financial gain, the fact that such manipulation interferes with accuracy of the vessels location allows the vessel to illegally capture fish above its permitted quota.[27] Proceeds from such sale are deemed as illicit financial flows.

Quantitative research out of Africa based on these examples is challenging and inaccessible. Hence, in writing this policy brief, netnography[28] was utilised as an online research method to search topics related to digitalisation of money laundering, and to observe discussions on online hacker forums that were accessible through the surface web.[29] A large variety of keywords, from those linked with digital methods of payment to those associated with clandestine markets were used as the search terms. The data was then filtered to pick out relevant content. Official reports from the fishing sector discussing IUU fishing and use of technology to alter data transmission were also reviewed. Thus, what is presented here is an analysis based on accessible data and reports.

A number of online transactions take place daily on the web. The web ecosystem itself is such that part of it is visible, and the other part invisible. The visible part is referred to as the surface web, where search engines are able to find the content that is sought after. Surface web makes up approximately 4% of the web. The invisible part, that is the underbelly of the internet, is where search engines cannot find the content being sought since it is intentionally hidden.[30] Ozkay and Islam have categorised the invisible web into three; deep web, dark web and the dark net.[31] A number of legal and illegal activities take place within the deep web and it makes up almost 96% of the web. Purely illegal activities are facilitated through the dark web where content is hidden intentionally and cannot be accessed by users surfing on standard browsers. The dark net is part of the deep dark web and can only be accessed through hidden web addresses and server locations.

Such clandestine nature of the invisible web enables illicit finance to flow from it. This is where new digital business models can be used to steal financial data (carding), make illegal financial transfers (loot boxes), disrupt or manipulate data (phantomware for sales suppression) and execute any other unlawful actions (fraudulently intercept/bypass signal transmissions). Each of these methods are discussed next and the losses incurred by the African continent are indicated.

Carding

The hacker identifies vulnerability in the victim's online presence and exploits the weakness to send a malware that infects the point of sale (POS) terminal. The malware then collects victim's information (reads credit card data), exfiltrates the data and transfers it to the hacker. The hacker then uses the stolen data to make an earning by selling it to carding forums, which are websites for selling credit and debit card data.[32] The buyer can pay using bitcoin. The card details are then sent to the buyer via a download link accessed over a TOR (The Onion Routing) browser[33] that guarantees anonymity. [34]

The buyer can then opt to covert the card data into a counterfeit plastic card. To do this, the buyer can

[20] Marcia Kaplan, 'Africa: An Emerging Ecommerce Market with Many Challenges', *PracticalEcommerce*, June 13, 2018. Available at: https://www.practicalecommerce.com/africa-emerging-ecommerce-market-many-challenges (Accessed February 2020).

[21] OECD, 'Statement by the OECD/G20 Inclusive Framework on BEPS on the Two-Pillar Approach to Address the Tax Challenges Arising from the Digitalisation of the Economy', January 2020. Available: https://www.oecd.org/tax/beps/statement-by-the-oecd-g20-inclusive-framework-on-beps-january-2020.pdf (Accessed February 2020).

either create the counterfeit card himself if he has the required Encoder hardware and software to write the data onto a plain plastic card with a magnetic strip. Such hardware is available on e-commerce websites and the software can be purchased from the dark web. Alternatively, the buyer can access the dark web forums where criminals specialise in creating counterfeit card using stolen data. The buyer can then swipe the counterfeit credit card to make in store payments. Such criminal activity cost the African continent to lose US$3.5 billion in 2017.

The use of online gaming websites to creating online money laundering accounts

Online game developers are usually not associated with money laundering. However, the game-based model itself can be used to launder money. The criminals involved will open a number of different accounts on massively multiplayer online role-playing games, abbreviated as MMORPGs, that use credits which players can exchange for real money. Immediately following the ushering of the New Year 2020, the Financial Times reported that a popular video game developed and published from Seattle, US announced that 'nearly all key purchases that end up being traded or sold on the marketplace are believed to be fraud-sourced'.[35] Money launderers liquidated their illicit gains by trading the 'container keys' that are used to obtain in-game items. They can use illicit money to buy virtual currency or a particular item, then sell it, often at a cheaper price to an unwitting gamer. Many online based games developers have not built in safeguards such as 'know your customer' requirements or anti money laundering regulations that apply to payment processors.

A 2018 report prepared by the Commonwealth of Australia revealed that a number of games provide gambling style transactions. They do this by selling chance-based items, referred to as loot boxes.[36] The report estimated that the global gaming industry was valued at US$117 billion of which 25% was generated through loot boxes. Loot boxes have been targeted by the dark corner of the industry. 2019 statistics reveal that the Kenyan online game industry is worth over US$50 million,[37] while Egypt holds US$293 million as the lion's share of revenue generated from online games, followed by South Africa's gaming industry estimated at US$216 million. Morocco and Nigeria follow closely behind with estimated earnings at US$129 million and US$122 million.[38] It is expected that the African online gaming industry will be worth US$174 billion by 2021.[39] In Africa loot boxes may fall under the legal framework on lotteries and gambling. Quantitative data on whether money launderers have placed, layered and integrated their illicit proceeds through online games in Africa is unavailable.

Electronic sales suppression and under-reporting of income

In digitisation of the cash register to the electronic mode questions arose around the integrity of the transactions recorded. While it ensured tax compliance by businesses, it also became susceptible to sales data deletion or alteration through purposeful misuse of hardware and software. In November 2019, the South African Revenue Service succeeded in holding Africa Cash & Carry guilty for using a sales suppression system to alter its sales data to reduce its tax liability.[40] Sales suppression is now more sophisticated. The use of phantomware (installed as a software and becomes part of the sales register) and zappers (external device or online program that can be connected to the register) as electronic sales suppression tools have been commonly used to covertly manipulate the sales record. Sales suppression is also offered as an online service. The service provider, usually from a foreign jurisdiction, can delete, alter and replace sales data or cause remote crashing of the hard drive which then makes it difficult for tax authorities to detect.[41] Technology, therefore, can be manipulated and used to defeat the collection of taxes. This directly inhibits domestic resource mobilisation.

Interconnect bypass device

This is a device that is used to bypass the legitimate route of a call resulting in revenue loss. Those engaged in such fraud use Voice over Protocol – Global

22 Quinn DuPont, *Cryptocurrencies and Blockchains* (Cambridge: Polity Press, 2019); Paul Vigna and Casey, Michael, *The Age of Cryptocurrency: How Bitcoin and Digital Money Are Challenging the Global Economic Order* (New York: St. Martin's Press, 2015).

23 Can be accessed through Google Chrome, Mozilla Firefox, Opera etc.

24 Can be accessed through Freenet, Tor, GNUnet, 12P, OneSwarm, Retroshare. For more information on the dark web see: Erdal Ozkay and Islam, Rafiqul, *Inside the Dark Web* (Florida: CRC Press, Taylor & Francis Press, 2019).

25 Foley, Sean, Karlsen, Jonathan and Putniš, T lis J, 'Sex, Drugs, and Bitcoin: How Much Illegal Activity Is Financed Through Cryptocurrencies?' *The Review of Financial Studies*, Volume 32, Issue 5, May 2019, Pages 1798–1853, https://doi.org/10.1093/rfs/hhz015

26 Erdal Ozkay and Islam, Rafiqul, *Inside the Dark Web* (Florida: CRC Press, Taylor & Francis Press, 2019), see Chapter 5 on Cybercriminal Activities in Dark Net.

System for Mobile Communications (VOIP-GSM) gateways, in other words SIM boxes, to receive incoming calls via wired connections and deliver them to a cellular voice network. The effect of such bypass is that the call appears as a local call incoming from a customer's phone. The lawful way to make international calls is first described and thereafter the bypass fraud. Person X in Kenya makes a call to person Y in London using Safaricom, a local mobile operator. Safaricom through its international gate transfers the call to a transient operator, who then routes person X's call through voice over IP to the mobile operator in London and pays a toll. Thereafter, the mobile operator terminates the call through person Y's network. In bypass fraud, the transient operator routes the call through a SIM box placed in London using VoIP, the SIM box the reroutes the call through London's mobile operator and pays for just the local call. This averts the payment of the toll, which is higher than the local call rate. SIM box fraud has cost Ghana US$5.8 million,[42] Kenya US$500 million,[43] and Uganda US$144 million.[44] Generally, Africa loses at least US$150 million every year to SIM box fraud.[45]

Manipulation of electronic surveillance and monitoring systems

Fishing vessels engaged in illegal, unregulated and unreported (IUU) activities use digital tools to manipulate the Vessel Monitoring System (VMS) that enables authorities to track and monitor their location. Fishing vessels are required by law to have VMS installed. These vessels are required to be transmitting signals on VMS. The reliability of VMS transmission can be compromised by tampering with its onboard black box by cloning the onboard communications terminal so that the surrogate gives out false information and interfering with the outgoing signal from the blue box or the incoming positioning signal from the GPS. Such manipulation allows the fishing vessel to engage in IUU fishing. Global losses as a result of IUU fishing is estimated to be between US$10 and US$23.5 billion per year.[46] West Africa loses approximately US$1.3 billion annually in IUU fishing.[47] Kenya alone loses US$100 million per year to IUU fishing.[48] IUU fishing presents a challenge to achieving sustainable, legal and ethical fisheries. It also disrupts the economic and social wellbeing of local fishing communities. Technology therefore, has the potential to pose digital threats to the fishing industry and generate illicit finance.

Conclusion

Digital finance can add US$4.2 trillion in new deposits and US$2.1 trillion in new credit.[49] Such rapid growth of the digitalisation of the economy also makes it susceptible to illicit attempts to either make an illicit gain, an illicit transfer or use the digital space to cover and integrate their illicit gains through the internet and digital technologies. Consequently, this undermines the state's tax collection capacity. Looked at broadly, the movement of illicit finance across the digital space affects the long-term sustainable development of economies, and implementation of the SDGs and Agenda 2063.

The Agenda 2063 Financing and Resource Mobilisation Strategy has outlined the typology of the sources for financing Agenda 2063. These range from government budgetary increases, crowd sourcing for social causes, pure commercial finance from both public and private sources/savings including domestic capital markets, concessional loans, market price-based commercial loans, equity and other market instruments, FDI, and portfolio investments by the private sector (through debt, bonds, equity and other securities). Clearly, DRM has been positioned to shoulder the great burden of financing the interrelated SDGs and Agenda 2063. Despite the DRM focused financing, the FRM does not adequately feature platform-centred businesses whose private flows can be leveraged to finance the agendas. In this regard, national tax policies can be developed to include subscription based, ad-supported, freemium, and e-commerce business models within the country's tax base.

27 See: Kyle Wilhoit and Balduzzi, Marco, 'Vulnerabilities Discovered in Global Vessel Tracking Systems', *Security Intelligence Blog*, October 15, 2013. https://blog.trendmicro.com/trendlabs-security-intelligence/vulnerabilities-discovered-in-global-vessel-tracking-systems/ (Accessed February 2020).

28 Robert Kozinets, *Netnography: Redefined*. London: Sage (2015). This is basically an online form of fieldwork that adapts ethnographic methodology.

28 I was able to identify a number of sophisticated hacker forums by reading reports published by Interpol and following leads dropped during conversations between online users that I was observing on surface web hacker forums, but I was not able to access these sophisticated dark web links even by using TOR connection which is easy to download and is not illegal. This is because the dark web hacking forums employ sophisticated anti-crawling measures to protect against visitor machines. Also, I was unaware of the specific code words to protect against spies. One such attempt to access the black hats hackers forum resulted in my computer crashing. Some of the websites that I was able to observe discussions on were: SamSara Market using paieqfjlf45iwjeq.onion (selling stolen data and counterfeit consumer goods, uses cryptocurrency), Berlusconi Market using un3akockjbxly4nm.onion (scamming website, uses cryptocurrencies), Darkode using https://darkode.me/ (selling malicious malware for hacking, examining customer reviews were helpful to identify this, before the comments were closed). I then became worried of the risk of malware infections in continuing to further look into these websites. The Sophos antivirus downloaded on my MacAir began picking up on warning signals.

This policy brief has provided estimates of the revenue that can be earned from digitalisation. FinTech, which is estimated to generate about US$3 billion by 2020 can potentially be leveraged to progressively achieve the goals set out in the agendas. Private flows from digital business models can also be tapped and directed to fund specific targets set out in the agendas. Loss of revenue resulting from IFF as exacerbated through digitalisation, once contained and curbed, will also add to the available domestic revenue basket. This policy brief has tabulated the amount of revenue that can be generated as a result of the digitalisation of the economy. Accordingly, in leveraging such available finance, African governments must comprehensively understand the nature, functioning and dynamics of the data driven digital economy. Such understanding will then direct how digitalisation of finance can be used for development purposes, solving societal problems, help improve economic and social outcomes and be a force for innovation and productivity growth. Hence, national level analyses on (i) harnessing digitalisation to maximise development goals, (ii) determining the methods of financial flows over digital business platforms, and (iii) identifying loopholes that erode revenue generation, are paramount to secure financing of the SDGs and Agenda 2063.

[31] Erdal Ozkay and Islam, Rafiqul, *Inside the Dark Web* (Florida: CRC Press, Taylor & Francis Press, 2019).
[32] Ibid.
[32] Further detailed reading: The Underground Ecosystem of Credit Card Frauds, available at: https://www.blackhat.com/docs/asia-15/materials/asia-15-Singh-The-Underground-Ecosystem-Of-Credit-Card-Frauds-wp.pdf (accessed 01 February 2020).
[33] Deepanshu Choudhary, The Onion Routing – The Good and the Bad, Symbiosis Institute of Computer Studies & Research (2018) DOI: 10.13140/RG.2.2.22889.34406
[34] Nir Kshetri, Cybercrime and Cybersecurity in Africa, *Journal of Global Information Technology Management*, Volume 22, 2019.
[35] Tim Bradshaw, 'Video games are easy channel for money launderers', *Financial Times*, January 2, 2020. https://www.ft.com/content/4658d340-24f6-11ea-9a4f-963f0ec7e134 (Accessed on February 2020).
[36] Commonwealth of Australia, Gaming micro-transactions for chance-based items, Environment and Communications Reference Committee, 2018.
[37] Mary-Ann Russon, 'It's time for Africa in video games', *BBC News*, January 31, 2019. https://www.bbc.co.uk/news/business-47070645 (Accessed on February 2020); Christina Gough, Kenya online social games market value 2014-2023, *statista*, November 7, 2019 https://www.statista.com/statistics/558015/kenya-socila-online-games-market-value/ (Accessed February 2020).
[38] Christina Gough, 'Leading video gaming markets in Africa in 2018, by revenue', *statista* February 5 2019. https://www.statista.com/statistics/699112/video-games-revenue-africa-countries/ (Accessed February 2020)
[39] Wasulu Habib Olawale, 'The opportunities for gaming in Africa', *INGRESSIVE*, August 27, 2019. https://www.ingressive.co/articles/2019/8/27/the-opportunities-for-gaming-in-africa
[40] **Sizwe Dlamini**, Sars wins R1 billion tax evasion case, *BUSINESSREPORT* November 28, 2019 https://www.iol.co.za/business-report/economy/sars-wins-r1-billion-tax-evasion-case-38120019 (Accessed February 2020).
[41] OECD, Technology Tools to Tackle Tax Evasion and Tax Fraud, (2017).
Adeyemi Adepetun, 'Africa: Government Charged as SIM Boxing Menace Rips Africa', *The Guardian* March 27, 2019 Available: https://allafrica.com/stories/201903270603.html (Accessed February 2020)
[43] *Kamau, Scola, Benard Busuulwa and Jean Pierre Afadhali,* 'Simbox fraud hits East Africa's one network area, eats into telecom revenue', *The EastAfrican,* January 30, 2016 Available: https://www.theeastafrican.co.ke/business/Simbox-fraud-hits-East-Africa-s-one-network-area/2560-3055670-swygvvz/index.html (Accessed February 2020)
[44] SimBox fraud still thrives in Africa – example of Uganda, ANTRAX (2019) Available: https://en.antrax.mobi/simbox-fraud-africa-example-uganda/ (Accessed February 2020).
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