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China's Digital Silk Road in Africa and the Future of Internet Governance

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ABSTRACT

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The Digital Silk Road (DSR) is a Chinese policy initiative launched in 2015. Six years later, there is relatively little concrete information about what it has achieved so far. This study offers a preliminary analysis of what the DSR entails in Africa. We seek to understand its effectiveness as a policy initiative by measuring its relationship to the Chinese government's promotion of "cyber sovereignty". In particular, we focus on a series of proposals made by Chinese telecommunications firms at the International Telecommunications Union (ITU) between September 2019 and May 2020, and the subsequent public statement of support they received from a group of African countries in July 2020. We compare this with Chinese policy bank lending for technology projects in Africa that would meet the definition of the DSR's agenda. We find that Chinese lending for technology projects in Africa was actually greater before the launch of the DSR than after. We also find that there is very little relationship between Africa's loan-recipient countries and those who made public statements of support for Huawei at the ITU. Lastly, we find that despite their significance as a voting bloc Africa has made relatively few engagements at the ITU.

INTRODUCTION

In 2015 at the World Internet Conference in Wuzhen, China Xi Jinping defined cyber sovereignty as a principle by which the global community should:

> "respect the right of individual countries to independently choose their own path of cyber development, model of cyber regulation and Internet public policies, and participate in international cyberspace governance on an equal footing. No country should pursue cyber hegemony, interfere in other countries' internal affairs or engage in, connive at or support cyber activities that undermine other countries' national security."[1]

This statement and others like it tell us that China is open about its desire to promote this vision of the internet among the global community, and its Digital Silk Road (DSR) policy initiative appears to be a means by which it intends to shape those debates. This paper offers a preliminary analysis of the DSR and its relationship to internet governance. Scholarship on the issue of the DSR in Africa is only beginning, with scholars charting the evolution of the DSR in China's policy discourse, as well as the geopolitical implications of China's DSR for the US.[2] In this paper we use Chinese policy documents to outline what the DSR is and examine its implications for African countries. We find that there are still remarkably few details on how much money would be devoted to the DSR, whether it has a timeline, what its financing mechanisms are, or even what its geographical scope is.

We also seek to better understand the digital relations between China and African countries through looking at both the rate and size of Chinese loans for technology in African countries as well as African countries' support for China's technology standards in multilateral fora. Much of our analysis focuses on two documents submitted to the International Telecommunications Union (ITU) in July 2020 by groups of African countries in support of a Chinese proposal.

Our loans data was drawn from the China Africa Research Initiative's loans database, which we crosschecked and recoded to focus explicitly on loans that could be categorized as DSR-related according to definitions of the DSR by Chinese policy papers. We then gathered data on African contributions at the ITU to assess whether there was an observable relationship between the African countries that received Chinese DSR-related loans and the countries that supported Chinese proposals at the ITU. We also sought to understand whether the advent of the DSR has led to any noticeable changes in Chinese lending for technology-related projects, and we also identify patterns that have emerged from Chinese lending for technology-related projects.

DOES CHINA HAVE A DIGITAL STRATEGY IN AFRICA?

The following section provides a brief definition of the DSR according to Chinese policy documents. It concludes that a high-level vision for Chinese government activity on Information and Communication Technologies (ICT) in the Belt and Road Initiative (BRI) countries has been articulated; however, the absence of concrete details about which countries are included in the DSR, or the amounts and kinds of resources to be deployed to achieve this vision, make it difficult

to assess on its own terms how successfully the Chinese government's program has been implemented.

Next, we explain how international standards are key to China's overall science and technology ambitions. Through an overview of the relevance of technical standards to industrial strategy, this section outlines how Africa's activity in international standards development bodies could have a significant role to play in China's global technology ambitions.

What is the Digital Silk Road?

In 2015, China articulated its BRI – an overarching international strategy to connect Asia with Africa and Europe via land and maritime networks with the stated goal of regional integration, increased trade, and economic growth.[3] Regional integration, according to the 2015 White Paper has three types of connectivity: transport infrastructure, energy infrastructure, and ICT infrastructure. ICT infrastructure is conventionally referred to as the "Information Silk Road" and in China's 2015 National Development and Reform Commission White Paper the Chinese government articulated a need for: "bilateral cross-border optical cable networks at a quicker pace, plan transcontinental submarine optical cable projects, and improve spatial (satellite) information passageways to expand information exchanges and cooperation."[4] The Information Silk Road is presented as both a boon to Chinese tech companies and a form of support for developing country partners.[5]

Digital technologies have become central to the implementation of the Belt and Road. In 2017, at the first Belt and Road Forum, President Xi Jinping outlined the critical role of digital technologies to the overall BRI and suggested that, collectively, China and member countries should jointly pursue frontier areas such as the digital economy, artificial intelligence, nanotechnology, quantum computing, big data, cloud computing, and smart cities to create "a digital silk road of the 21st century."[6] At the second Belt and Road Forum in 2019, Xi again advocated for a greater focus on the digital element of the BRI:

> "We need to keep up with the trend of the Fourth Industrial Revolution, jointly seize opportunities created by digital, networked and smart development, explore new technologies and new forms and models of business, foster new growth drivers and explore new development pathways, and build the digital Silk Road and the Silk Road of innovation."[7]

Xi proposes that this will be implemented by the 'Belt and Road Science, Technology and Innovation Cooperation Plan' which focuses on four initiatives: Science and Technology People-to-People Exchange; Joint Laboratories; Science Park Cooperation; and Technology Transfer. In addition, China will actively implement the Belt and Road Talents Exchange Program, and between 2019-2024 offer 5,000 opportunities for exchange, training, and cooperative research with BRI participating countries. Finally, Xi articulated how China "will also support companies of various countries in jointly advancing ICT infrastructure building to upgrade cyber connectivity."[8]

Africa is a key partner for China's BRI, and therefore its digital interests too. According to China's BRI website, the Chinese government has signed 45 bilateral cooperation agreements with African countries.[9] Only Niger, Burkina Faso, Central African Republic, Benin, Malawi, Botswana, Guinea Bissau, Sao Tome and Principe, Eritrea, Lesotho, Eswatini, Comoros, and Mauritius have not signed an agreement with Beijing.

In 2015, China and the African Union also issued a Joint Declaration which covered a broad range of issues that includes strengthening cooperation on infrastructure projects including but not limited to information and communications. It also gave priority to promoting mutually beneficial cooperation in technology transfer (and other areas); and enhancing collaboration in the development of industrial production capabilities by establishing industrial parks and clusters, technology parks, and providing training for personnel and managers.[10] In addition, the Declaration goes on to commit to "unswervingly coordinate and cooperate with each other and safeguard our common interests. In the United Nations, international financial institutions and other multilateral organizations, we will strengthen coordination and cooperation on regional and international issues of common interests."

However, despite the lofty goals outlined in the Joint Declaration, there is no clarification on what membership of the DSR actually means in practice for participating countries. Despite this missing detail, support for the DSR has continued at pace. In 2016 Chinese media reported that China had concluded Memorandums of Understanding (MOU) with 16 countries on the construction of the DSR, an evolution of the original Information Silk Road first mentioned in the 2015 NDRC White Paper on the BRI.[11]

We found no publicly available evidence that attested to which countries were members. Some have tried to list or map DSR member countries, but often on the basis of Chinese exports of surveillance systems or the sale of Huawei equipment.[12] While these metrics could certainly be understood to fall within the parameters of the DSR's objectives, evidence of these sales and exports is not the same as categorical DSR membership.

The most comprehensive study of BRI MOUs to date has been conducted by Fravel *et al*.[13] The authors downloaded publicly available documents and directly contacted government officials for copies of MOUs wherever possible. In total, the team only gathered two MOUs for Africa; one in Sudan (2020) and one in Algeria (2019). Despite both of these countries joining the BRI after the start of the DSR, neither had any mention of the DSR or DSR-related themes in their MOUs.[14] More broadly, Fravel *et al*.'s research found that all of the MOUs they analyzed were non-binding and typically last only five years.[15]

We were, however, able to find one publicly available MOU signed with Australia's Victoria State government that mentions the DSR. It shows that their commitments are no more than the following:

> "Based on existing cooperation, the Parties will enhance policy cooperation, facilities connectivity, unimpeded trade, financial cooperation, people-to-people bond, and promote Digital Silkroad Cooperation, etc."[*sic.*][16]

This quote is the only mention of the DSR or anything that could be possibly related to the DSR in the whole document signed by China and the Australian State of Victoria.

As such, the notion of "DSR countries" that has been articulated in Chinese policy documents which is both a subject of pride and terror - depending on one's affiliations - is difficult to measure.[17] It is certainly a public relations coup for Chinese policy makers to demonstrate their alliances and ambitions with partners, but there is still a gap in our understanding of how best to measure these goals. For instance, there are still remarkably few details on how much money would be devoted to the DSR, whether it has a timeline, what its financing mechanisms are, or even what its geographical scope is. We therefore propose to shed some light on this topic through alternative means.

Firstly, we know that loans are a key facet of the DSR.[18] Financial credit is both a means of supporting Chinese firms' growth into foreign markets, as well as a means of building goodwill with foreign countries who borrow. Loans can thus simultaneously represent political priorities for Chinese policy makers and potential soft power gains among debtors. This focus will be discussed further in the research methodology section below.

Secondly, we know that Chinese foreign policy has grown increasingly focused on influencing global standards bodies in recent years.[19] This is due in part to China's industrial policy and global ambitions for technology leadership. Developing country partners play an important role in this strategy. The following section explains this significance in greater detail.

Influencing International Digital Technical Standards

Technical standards matter because they are a set of rules that determine how things are done, and in the case of digital technologies they facilitate interoperability enabling connectivity. Writ large they facilitate globalization, extending access, convenience, and vulnerabilities in equal measure. Formulating and promoting official standards is widely recognized as an important tool for improving product quality, safety, coordination, and interoperability.[20] Complying to a different technical standard can raise production costs for companies that create products to a different standard, but in turn it might provide access to a larger group of consumers. Not complying with a technical standard would limit a given player's access to that market.

There are two main kinds of standards-making governance models: multi-stakeholder and multilateral. The US is a proponent of the multi-stakeholder model which can be understood as the convening of governments, private sector, civil society, and intergovernmental organizations in what are called standards development organizations (SDO).[21] In contrast, multilateral models such as the ITU give only government representatives the right to vote.[22] The current SDO ecosystem does not satisfy all actors and as a result there is an element of "forum shopping",

where work on certain technical standards are proposed in fora that are most advantageous to the actors in question, whether or not they believe they may reasonably succeed.[23]

Today, China is a significant force across the standards system and in key standards bodies. At the highest level, Chinese experts have held the top positions in the ITU, the International Organization for Standardization (ISO), and the International Electrotechnical Commission (IEC). In 2015, Zhang Xiaogang was elected for a three-year term as the President of the ISO; in 2019 Shu Yinbao was elected to serve as President of the IEC after having served as Vice President between 2013-2018; and in 2019 Zhao Houlin started his second term as Secretary General of the ITU after having served as Deputy Secretary General for eight years from 2007-2015.[24]

China's activity in the ITU has most recently come under scrutiny because of Huawei's proposal of 'New IP'. Between September 2019 and May 2020, Chinese firms, academics, and government representatives submitted a series of proposals to the the ITU to develop a "top down design for the future network" named 'New-IP' (New Internet Protocol) over the next study group period 2021-2024.[25] This 'New-IP' was originally understood to be a replacement for the current internet protocol which enables interoperability of the internet and is called Transmission Control Protocol/Internet Protocol (TCP/IP). TCP/IP is a foundational technical standard of the global internet, and was originally developed in a multistakeholder SDO, the Internet Engineering Task Force (IETF).

The Chinese proponents claimed that the current internet protocol is not suitable for the next generation of telecommunications technologies because it is designed with only telecommunications and internet networks in mind. In essence, they argued that if TCP/IP protocols are incapable of transferring data packages fast enough then this would pose a risk to people dependent on 5G technologies; such as passengers of driverless cars or patients in remote surgery operations.[26] By contrast, they propose that the 'New IP' will be better suited to the Internet of Things, AI, and Big Data.[27] However, critics of China's proposal have argued that it will also "lead to more centralized, top-down control of the internet and potentially even its users, with implications for security and human rights."[28]

The proposals were submitted to Study Groups (SG) 11, 13, and 17, but our study only focuses on the proposals in SG 13 because that is where there was most activity around the proposals; from African members and others. The full list of Chinese representatives that submitted these proposals to SGs 11 and 13 included: Huawei Technologies, China Unicom, China Telecom, China Mobile, Tsinghua University, Beijing University of Posts and Telecommunications, and the country's Ministry of Industry and Information Technology (MIIT).[29]

The inclusion of New-IP in the next period of work for SG13 has been met with strong opposition by some ITU member states including the US, UK, and other western European countries. Some of the criticisms of New-IP are technical and highlight that the proposal includes many elements that are untested and unproven.[30] Critics have also consistently pushed for a gap analysis, to identify

the need for a new internet protocol and how this project will address that need. Other criticisms focus on remit, arguing that the realm of internet protocols is the mandate of the IETF.[31]

In the standards making process where the system is one-country, one vote, an alliance with African countries can represent up to 54 votes. This makes for a critical alliance to shape the consensus-based agenda and can influence which standards are adopted by the ITU as an international standard that could then be adopted by other countries.

The decision to adopt the Chinese proposal of studying 'New IP' will be decided when the ITU's World Telecommunication Standardization Assembly next meets in March 2022.[32] If ITU member states vote in favor of China's New IP proposal, then member countries would be committing to developing a new internet protocol at the ITU. However, it is important to stress that this would not mean that New IP would de facto replace TCP/IP. Firstly, governance and technological developments of TCP/IP firmly remain under the control of the IETF, and there is a consensus among Western actors who hold the most power over these developments that these processes should not be transferred to the ITU.[33] And secondly, if New IP is released as a new internet protocol, it would be up to the market to decide the extent to which New IP is adopted; either in parallel to TCP/IP or as a replacement. These hypothetical next steps are beyond the scope of this paper, but if the proposals to study New IP pass at the ITU in March 2022 then it would at least represent a diplomatic success for China and the supporters of this proposal.

Therefore, we will look at the relationship between African countries that received Chinese technology-related loans and African countries supporting China's New IP work proposal at the ITU. African countries' support of the work item at the ITU is primarily political at this point and would not prove causality. We cannot conclusively say that because African countries received a loan they therefore voted in favor of China's proposed New IP; however, if there is a relationship, then it could imply that China's DSR is as much about its own industrial policy as it is about African countries' development needs. This is a good example of what China terms "win-win" between Chinese and African interests but it is also a framework that has potentially global ramifications for all other countries.

DATA AND METHODOLOGY

Loans Research

In order to determine the extent of Chinese lending for projects that could be considered part of the loosely defined DSR, we began by working with the CARI loans database. First, we identified all loans that could be considered part of the DSR, e.g., loans that were related to the construction of digital infrastructure, such as satellites, fiber networks, data centers, video surveillance, and e-government projects. We then supplemented the pre-existing research with additional research into publicly available news articles, company reports, press releases, and government records. For every loan, we sought to triangulate information drawing on local sources and Chinese sources

where possible, so as to ensure that the loan had indeed been disbursed. We conducted this research in Chinese, French, Portuguese, and English.

We sought loans data beginning in 2000 because this allowed us to see how lending patterns changed around the launch of the DSR in 2015. We expected to see a rise in lending after the DSR started appearing in Chinese policy documents. We were also interested to see which countries and which Chinese contractors were prioritized by these loans. A common mistake among researchers who have tried to document Chinese loans in the past is that loans are often mistaken for investments, or they are commitments that are signed but the funding or construction never follows through. The loans we documented were categorized as follows:

1. Loans that involved at least some Chinese finance
2. Loans financed by other financial institutions but constructed by Chinese companies
3. Loans in which Chinese banks and/or companies showed an active interest but had not actually followed through with finance or construction
4. Loans with some degree of Chinese interest or engagement, but which have not seen activity in three or more years (which we classify as inactive)

We initially gathered a list of 142 Chinese loans that were relevant to the DSR's ambitions. Among these, there were many loans that were close to DSR themes but that we chose to ignore in our analysis for a range of reasons. For example, in 2016, Poly Technologies extended a US$ 164 million loan to the Zambian government so that the Zambian police, immigration department, and prisons and drug enforcement commission could buy security equipment. In another case we omitted, from 2002, China's Ministry of Commerce lent US$ 6 million to Equatorial Guinea's state broadcaster to build itself a new national radio headquarters in a contract awarded to the China Radio Film & Television Design & Research Institute. There were also several instances of Chinese tech firms building projects that we deemed to be outside of the scope of the DSR. For example, in 2014, ZTE was the vendor in a Togolese loan from China's EXIM Bank to install public solar streetlights.

We only selected loans that we categorized as 'completed' or under 'implementation' for the purposes of our analysis. This produced a pared-down list of 90 Chinese loans between 2000 and 2019. Of these loans, 74 of the loans were taken out by African government ministries and 16 of the loans were taken out by private companies or state-owned enterprises (SOEs) in Africa.

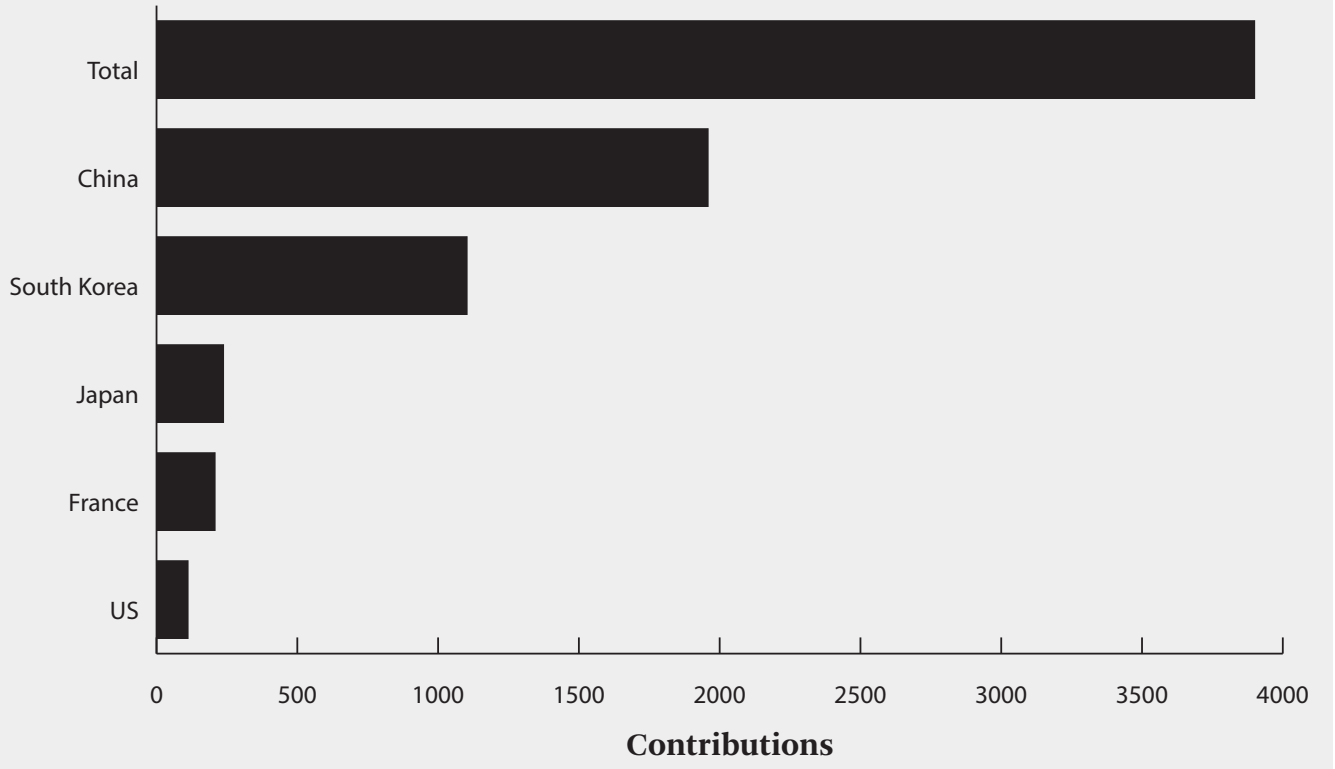
Technical Standards Activity at the ITU

To identify whether there was any relationship between China and African countries in international standards bodies we examined the behaviors of African countries in ITU Telecommunications standardization (ITU-T) between 2010-2020. We selected the ITU because it is both a multilateral standards development organization where there is more likely to be activity by African countries and it is also a forum that China has been keen to promote the significance of, vis-à-vis multistakeholder institutions.[34]

The ITU is a multilateral SDO where countries are the only actors that vote on standards ranging from protocol standards, cryptography, and facial recognition. All 193 members of the United Nations are automatically members of the ITU. Industry, research institutes, and civil society can and do participate in study groups (SGs) and submit proposals, known in ITU-speak as 'contributions' to shape the agenda.

The ITU's work is divided into study groups. The number of study groups can vary and during the 2017-2020 period there were a total of eleven study groups.[35] Within each period, SGs meet regularly to consider standards within each of these sub areas and develop recommendations, or a draft standard, which then needs to be approved by consensus. Members interact within these SGs through meetings to discuss work items; however, the formal way of proposing or objecting to certain work items is through 'Contributions'. Member States shape the agenda by submitting Contributions to relevant SGs to comment on work underway and set the agenda of future SGs by proposing new streams of work. The submission of Contributions is the mechanism by which technical standardization work at the ITU is processed. If a contribution for a new area of work is submitted, then there needs to be consensus for this proposal from member states in order for it to become a formal stream of work. After a work item is agreed upon then the standards development work takes place.

Figure 1: Top Five Country Contributions in Study Group 13 (2009-2020)



Source: Author's calculations based on ITU-T contributions.

As described by Hoffman *et al.*, the Chinese Communist Party's approach to technology naturally favors multilateral internet governance as opposed to decentralized, open, and multi stakeholder models. China lacks confidence in the multistakeholder model because it views multilateral negotiations as the only legitimate type of negotiation on global issues.[36]

For over a decade, China has been consistently active and influential at the ITU. China's experts have been voted into the most senior leadership roles, such as Zhao Houlin mentioned above who is currently in his second term as Secretary General of the ITU.[37] An examination of ITU written contributions by members over the past decade show that China's activity and influence at the ITU is not new. A study of contributions from China in the study group for Future Networks (SG13) – which served as one of the forums for theNew IP proposal – shows that China has submitted almost 50 percent of all contributions, as shown in Figure 1, outstripping co-members as the most frequent country contributor over an 11-year period.

The ITU generally follows a definition of consensus developed by the ISO and International Electrotechnical Commission which is:

> "General agreement, characterized by the absence of sustained opposition to substantial issues by any important part of the concerned interest and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments."[38]

Every SG has a chairman who serves as the judge of whether consensus has been reached or not. Due to this loose definition, it is not possible to say exactly how many countries need to be in support of a work item for it to then be adopted. Nevertheless, studying contributions is useful for discerning a country's support or objection to certain proposals and to demonstrate the level of country activity.

We examined the contributions of African countries in the SG for Future Networks (SG13). We downloaded all the contributions made to the SG over an 11-year period from the ITU website. Members of the SG made a total of 3,900 contributions over an 11-year period but only 65 were relevant to our study because they were submitted by African countries.

FINDINGS: LOANS DATA OVERVIEW

Financing mechanisms

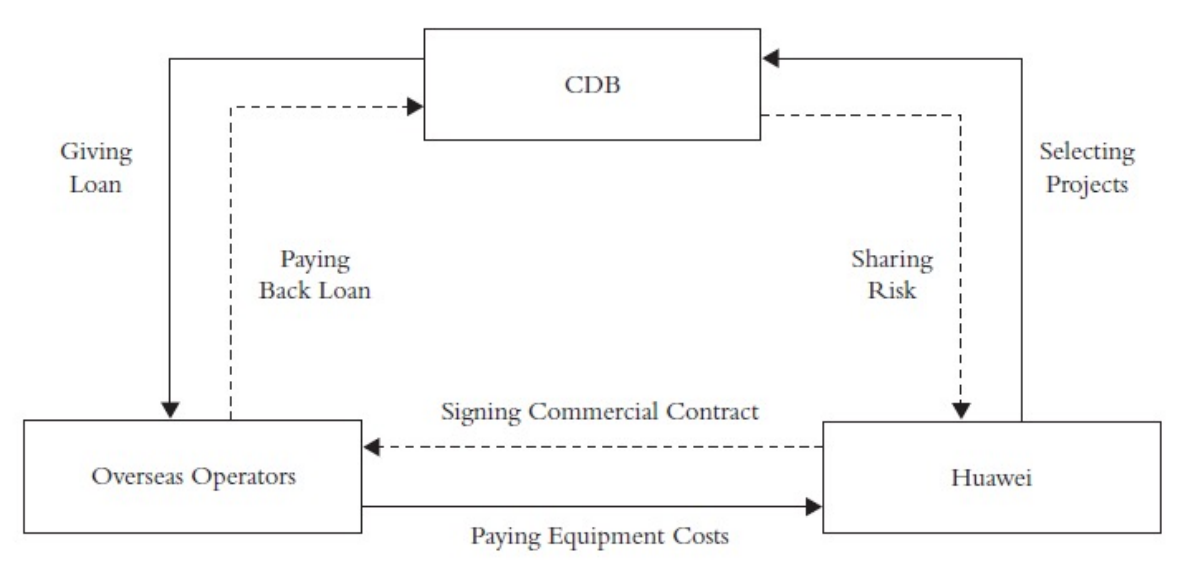
There are three main ways in which a Chinese contractor may be selected for a loan-backed project. In one scenario, an African government or firm identifies a Chinese good or service that they wish to buy, and they are lent the money from China's policy banks to facilitate the purchase. The second possibility is that an African government or institution requests financing for the development of a project, and the Chinese policy bank then recommends a Chinese contractor that could carry out the work, or some portion of it. The last way in which a Chinese contractor may work on a loan-backed project is by pitching their services directly to the African ministry or

institution and then introducing the client to financing opportunities from Chinese financiers; this is more prevalent than typically noted.[39] These loans come from a variety of sources, including:

- The Chinese Ministry of Commerce (MOFCOM)
- Policy banks such as the Export-Import Bank of China (EXIM Bank) or the China Development Bank (CDB)
- Private commercial banks, such as the Industrial and Commercial Bank of China (ICBC) or the Bank of China (BOC)
- Supplier credits or investment loan financing from Chinese firms (typically SOEs)

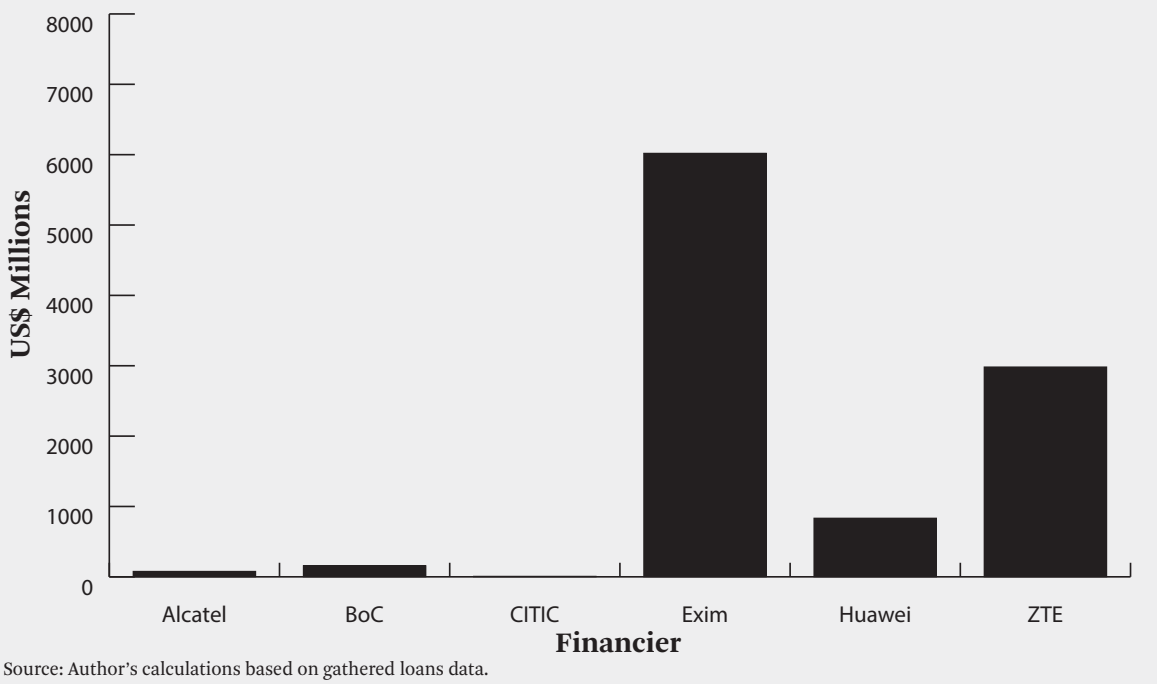
The loans themselves may also take a variety of forms, such as: commercial loans, zero-interest loans, concessional loans, export buyers' credits, preferential export buyers' credits, suppliers' credits, or master facility loans. We did not distinguish between loan-types in our analysis, but we did identify the financiers. In the case of supplier credits offered by companies like Huawei or ZTE, these are often ultimately funded by larger Chinese financial institutions.[40] For instance, in 2004, Huawei and CDB signed a US$ 10 billion agreement for overseas markets and then signed another agreement with CBD for US$ 30 billion in 2009.[41] The following figure explains how these financing arrangements worked in practice, and would apply similarly for ZTE or other firms able to extend credit in Africa.

Figure 2: An Example of the Development Finance Process in China



Source: China Development Bank and Renmin University, Development Finance in China: Case Studies (Beijing: Renmin University Publishing House, 2007). Quoted in: Sanderson, Henry, and Michael Forsythe. China's Superbank: Debt, Oil and Influence - How China Development Bank Is Rewriting the Rules of Finance. John Wiley & Sons, 2013. p.160

Figure 3: Chinese Loans by Financier (2000-2018)



Source: Author's calculations based on gathered loans data.

If we look at the main sources of finance, we find that China's EXIM Bank, Huawei, and ZTE are the biggest lenders. Our findings show that roughly 55 percent of Chinese lending to Africa is from China's EXIM Bank, and if we assume that Huawei and ZTE loans are actually CDB loans (as described in Figure 2 above) then this represents roughly 25 percent of DSR-related loans between 2000-2018.[42]

SOE Contractors

Of the loans we analyzed, the majority of companies were ultimately owned and operated by the State-Owned Assets Supervision and Administration Commission of the State Council (SASAC). SASAC is a commission founded in the last year of Premier Zhu Rongji's leadership, under which underperforming SOEs could be culled or better incentivized to perform successfully at home or globally.[43]

We have listed the Chinese contractors and vendors involved in Chinese loan-backed projects in Africa from 2000 to 2018 below, and Huawei is the only firm not to fall under SASAC or municipal SASAC leadership. Huawei is famous for saying that it is a private firm, owned by its workers.[44] This statement is disputed by Balding and Clark who focus on the fact that the "Huawei Holding Trade Union Committee' holds 99% of ownership and voting rights with Ren Zhengfei – Huawei's founder – holding the other 1%."[45] They thus conclude that since Huawei is effectively owned by a trade union, and trade unions in China are appointed administratively by superiors leading up to the All China Federation of Trade Unions, then Huawei should effectively be considered a SOE. It is a compelling argument and Huawei struggled to explain why this was false after the publication of the report.[46]

Based on our findings, Huawei was also the largest contractor involved in Chinese financed technology projects in Africa both by number of loans and by value of loans. As such, the loans data we have gathered sheds a new light on Huawei. If it really is a private company, then it is significant for being given greater financial support from Chinese policy banks than any other Chinese SOE in Africa. This is highly unusual, since the vast majority of Chinese lending in Africa that contracts Chinese firms, tends to involve SOEs. As such, even if Huawei really is a private firm, it could not be more significant to Chinese policy banks in Africa.

Table 1: Chinese Vendors and Contractors in Chinese Technology-Related Loans to Africa (2000-2018)

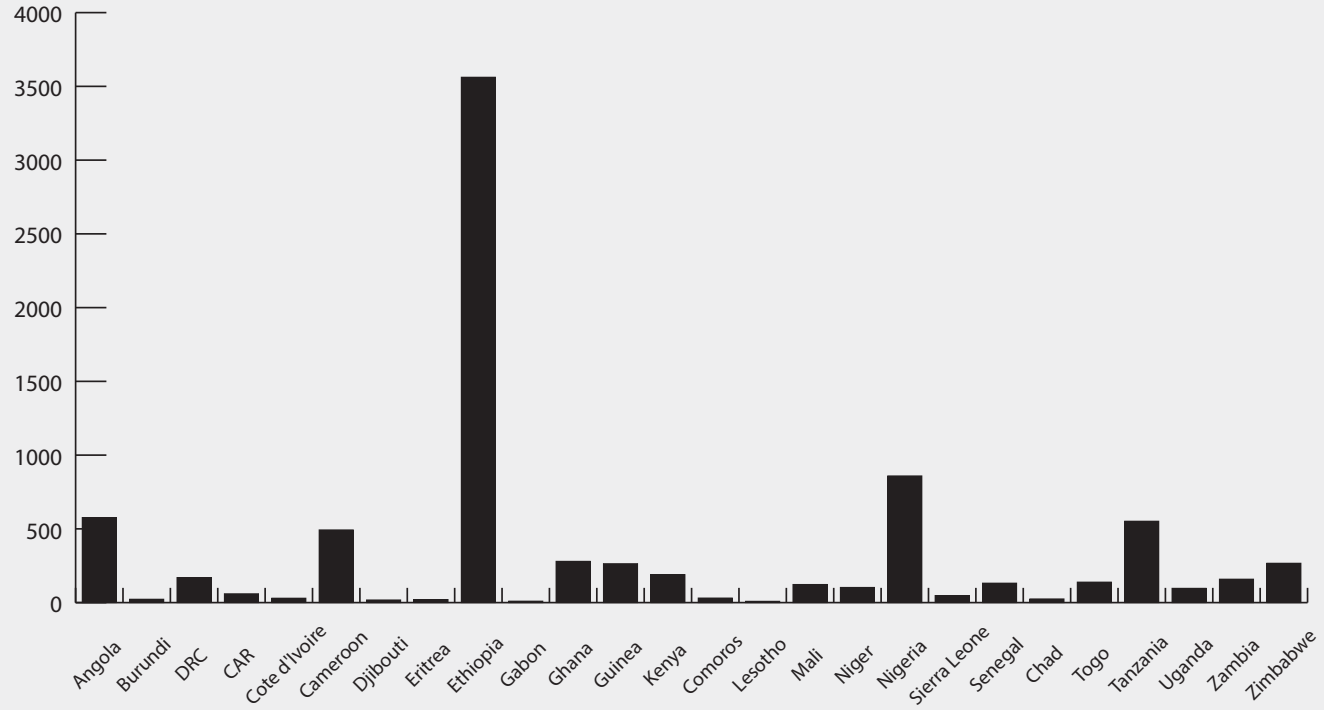
Chinese Contractor	Chinese Name	Number of Loan-Backed Projects
Huawei	华为技术有限公司	49
ZTE	中兴通讯股份有限公司	22
CITCC	上海贝尔阿尔卡特股份有限公司	7
Alcatel Shanghai Bell	四川通信建设工程有限公司	3
StarTimes	四达时代	3
Anhui Easy-Biz Digital Technology Co., Ltd.	中国通信建设集团有限公司	1
China Great Wall Industry Corporation	中国长城工业总公司	1
Qinghua Ziguang Company	安徽易商数码科技有限公司	1
Sichuan Telecom Construction Engineering Co.	紫光股份有限公司	1
Unispendour Software Company	清华紫光集团	1

Table 2: Value of Chinese Loan-Backed Projects in Africa where Chinese Technology Firms are Contracted (2000-2018)

Chinese Contractor	Loan Value 2000-2014 (US$ millions)	Loan Value 2015-2018 (US$ millions)	Loan Value 2000-2018 (US$ millions)
Huawei	3,102 (34.7%)	1,235 (71.0%)	4,337 (42.4%)
ZTE	3,936 (44.0%)	- (0.0%)	3,936 (38.5%)
Other	1,909 (21.3%)	504 (29.0%)	1,962 (19.2%)
Total	8,947 (100.0%)	1,739 (100.0%)	10,235 (100.0%)

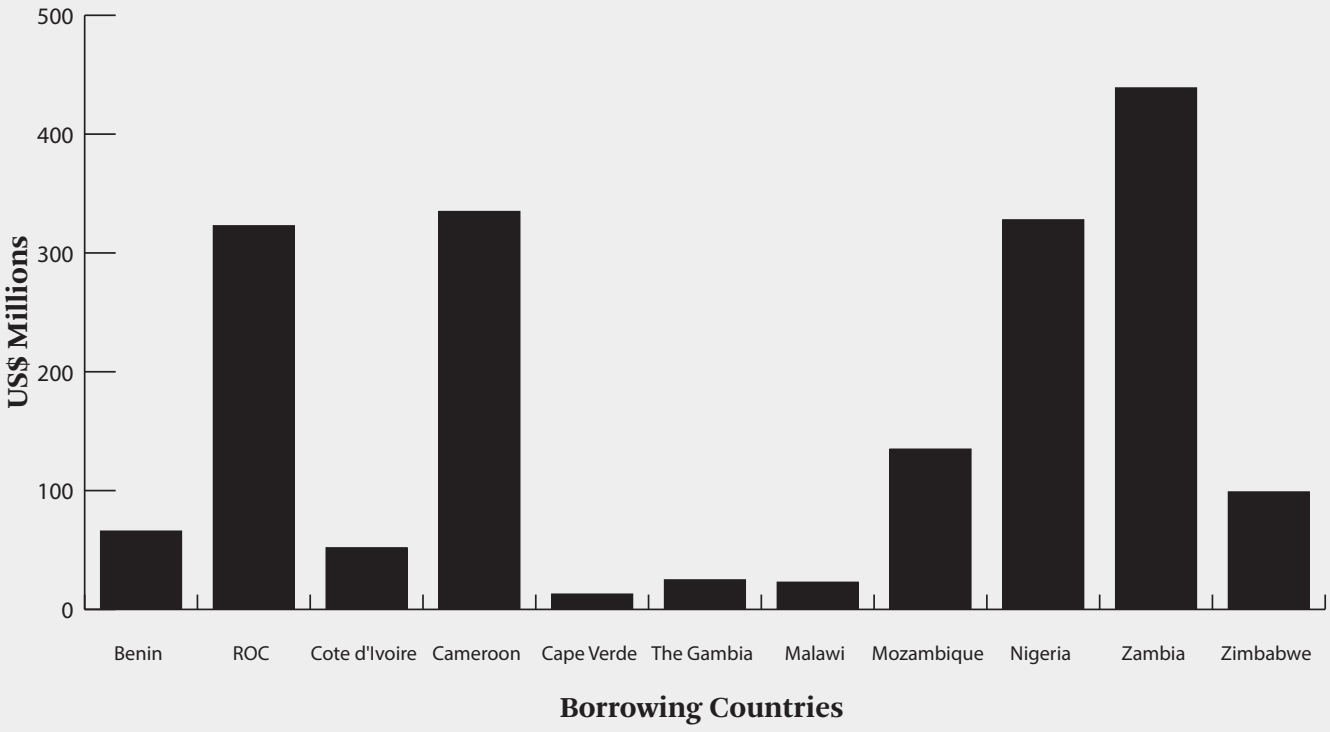
It is important to bear in mind that Chinese technology firms conduct much of their business as any private vendor or contractor would. They sell directly to customers, or the customers reach some financing arrangement that does not necessarily depend on Chinese banks. The majority of Huawei's equipment sales would presumably not need loans since their biggest customers will be

Figure 4: Chinese Technology Infrastructure Loans by Country in US$ Millions (2000-2014)



Source: Author's calculations based on gathered loans data.

Figure 5: Chinese Technology Infrastructure Loans by Country (2015-2018)



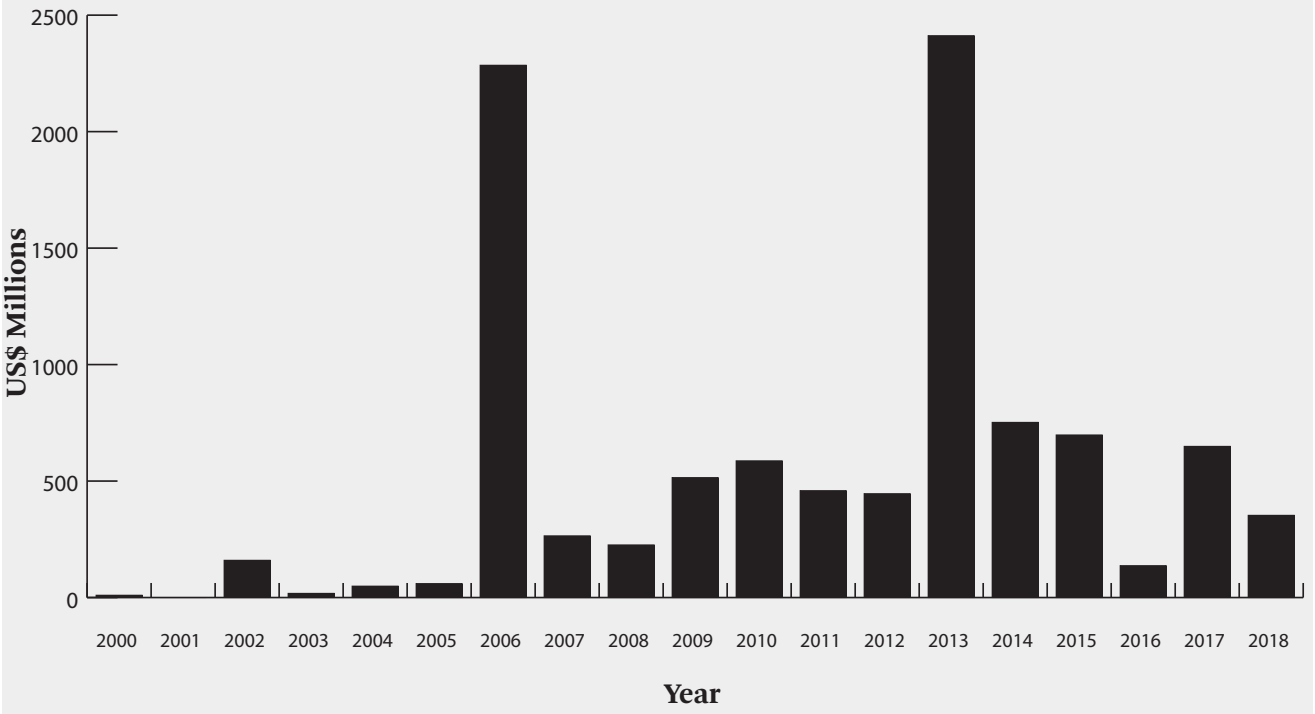
Source: Author's calculations based on gathered loans data.

firms like MTN, Vodacom, Orange, and Airtel whose pockets are deep enough to purchase the equipment outright or have alternative financing arrangements available to them. In many cases, Huawei and other vendors will be competing in private sector bids. As such, loans can only give us a small insight into Chinese technology firms' activities in Africa.

Nevertheless, loans can shed light on China's strategic priorities. For example, we are able to see which countries received the most loans, and what years most loans were disbursed. We found that Ethiopia was the largest loan recipient, having accrued just over US$ 3.5 billion in telecommunications-related loans from the Chinese government. Roughly US$ 2.7 billion of those loans was spent on projects contracted out to ZTE, and the remaining amount to projects contracted out to Huawei.

However, Ethiopia stands as an outlier compared with other African countries. Firstly, all loans were taken on by the Ethiopian government. This reflects Ethiopia's market structure which, until recently, had been dominated by Ethiopia's state-owned operator. Furthermore, all five loans to Ethiopia were reported as being issued by the Chinese firms themselves instead of Chinese banks (i.e., ZTE leant the Ethiopian government the money for the projects it carried out, and the same for Huawei). These were no doubt carried out in collaboration with the CDB in the process described in Figure 2. There were only four other loans listed in our data that were issued by Chinese firms.

Figure 6: Chinese Technology Infrastructure Loan Disbursements by Year, 2000-2018



Source: Author's calculations based on gathered loans data.

Table 3: African Contributions to Study Group 13 on Future Networks (2009-2020)

Country	Number of ITU Contributions												
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Benin	0	0	0	0	0	0	0	0	0	1	1	0	2
Burkina Faso	0	0	0	0	0	0	2	1	1	0	0	0	4
Central African Republic	0	0	0	0	0	0	0	0	2	1	1	0	4
Congo	0	0	1	1	0	0	0	0	2	0	1	0	5
Cote d'Ivoire	0	0	0	0	0	0	0	0	1	3	0	1	5
Ghana	0	0	0	0	0	0	0	0	0	0	0	2	2
Guinea	0	0	0	0	0	0	0	0	2	0	2	1	5
Kenya	0	0	0	0	0	0	0	0	0	0	1	0	1
Mali	0	0	0	0	0	0	0	0	0	3	1	1	5
Niger	0	0	0	0	0	0	0	0	0	0	0	1	1
Nigeria	0	0	0	0	0	0	0	1	0	2	0	1	4
Rwanda	0	0	0	0	1	0	0	0	1	0	0	0	2
Senegal	0	0	0	0	0	0	0	1	3	2	1	1	8
South Sudan	0	0	0	0	0	0	0	0	0	0	0	1	1
Tanzania	0	0	0	0	0	0	0	0	0	0	0	1	1
Uganda	2	0	0	0	0	2	4	1	0	1	0	1	11
Zambia	0	0	0	0	0	1	2	0	1	0	2	1	7
Zimbabwe	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	**2**	**0**	**1**	**1**	**1**	**3**	**8**	**4**	**13**	**13**	**11**	**12**	**69**

Our most surprising finding was that the largest amounts of technology-related loans were actually disbursed before the launch of the DSR in 2015. This suggests that the DSR may serve as a "rebranding" of pre-existing Chinese engagements in Africa, much like the BRI.[47] It is also surprising that technology-related loans have seemingly decreased since 2015 (see Figure 6), given that this is one of China's principal mechanisms for offering development assistance to a given target. If the DSR were to be understood as development focused, then we would expect loans to be a prominent feature of that support.

NEW - IP AT THE ITU AND AFRICA

We surveyed 64 Contributions made by 18 African countries (see Table 3) in SG13, to identify whether we could discern any patterns from Africa in support of China's New-IP proposal.

Table 4: Contributions Submitted by a Coalition of African Countries

Date	Contribution Number	Summary
July 10, 2020	1064	Advocating support of Huawei's new IP work item
June 8, 2018	400	Advocating to promote the rapid implementation of strong regulatory frameworks to facilitate African integration through ICT and data exchange
May 9, 2018	396	Proposal for a new work item to increase the use of ITU study group 13 standards in developing countries local standardization process
May 9, 2018	395	Proposal for more work to be done to facilitate transactions between high-level trust networks predominantly found in developed countries and low-level trust networks found in developing countries
May 9, 2018	394	Proposal to start a new work item to allow greater access for people with disabilities
May 9, 2018	393	Proposal to start a new work item to create a technical report on international mobile telecommunication standards for policy makers, particularly in developing countries

Overview of African Contributions to the Future Networks SG13

Over the period 2009-2020, 18 African countries submitted a total of 64 contributions to the Future Networks SG out of a total of 3,900 submissions. Overall, this is a relatively low participation rate. Uganda led the charge submitting 9 of the 65 contributions over 11 years. Other countries, including Kenya and Benin, have only submitted 1 or 2 contributions to this SG. The contributions submitted by African countries cover a diverse range of topics ranging from cloud computing, internet of things, and intelligence transport. Fifty-eight of the contributions are individual, which means that it was submitted by one African country. Six of the contributions were submitted by a group of African countries. Table 4 shows the other five instances over the 11-year period where some African countries have expressed collective support.

Contribution 1064

During July 2020, 10 African countries - Côte d'Ivoire, Guinea, Mali, Niger, Nigeria, Senegal, South Sudan, Tanzania, Zambia, Zimbabwe - submitted contribution 1064 in support of China's New IP work item.[48] This was the only contribution over the 11 years submitted by an alliance of African countries speaking out directly in favor of a contribution submitted by China. China also submitted the New IP work item in SG11 and the same African alliance (plus Burundi) submitted an identical proposal in parallel in SG11.

Contribution 1064 states that the aforementioned 10 countries consider China's proposals to be "critical to promote the development of comprehensive solutions addressing the requirements of numerous applications expected to be deployed in communication networks for verticals in the near future" including in: remote healthcare, smart agriculture, remote education, industrial and

mining applications, greener internet of things, and wild animal tracking. While some countries have participated in this SG previously, it is notable that this was the first time that South Sudan and Tanzania had ever submitted a contribution in this SG during the 11-year period.

Eleven out of a possible 54 African countries made this public statement of support for the New IP proposals. On the surface, contribution 1064 therefore demonstrates only partial African support for China's standards agenda at the ITU, although it's possible that many more supporters did not wish to state so publicly and will vote in favor of the proposals in March 2022. Furthermore, while Côte d'Ivoire, Guinea, Mali, Niger, Nigeria, Senegal, South Sudan, Tanzania, Zambia, and Zimbabwe demonstrated support for China's New IP proposal at the ITU, there are eight other African countries who have been active in that group over the past 11 years who did not write in support of New IP. However, this alone does not demonstrate that African countries as a bloc are more favorable to Chinese proposals in the ITU than Western proposals. A broader examination of contributions in other SGs would need to be conducted to see how African countries vote on other countries' proposals at the ITU.

Lastly, in comparing these findings with the loans data discussed in the previous section, we found very little connection between the signing of a DSR agreement, the disbursement of DSR-related loans, and the propensity to support China at the ITU. For instance, while Benin, Niger, Central African Republic, Malawi, Guinea, Eritrea, Lesotho, and Mauritius have not signed bilateral BRI agreements with the Chinese government, DSR-related loans have been provided to these countries. Also, eight of the ten countries who wrote in support of Huawei's New-IP have received DSR loans from China between 2000-2018. Based on the loans data we gathered, Côte d'Ivoire and South Sudan have not received loans from the Chinese government to deliver ICT infrastructure. Ultimately there were more countries who received DSR-related loans and did not submit a contribution in support of New-IP. The loudest silence so far has been from Ethiopia who we found to be the largest recipient of Chinese technology-related loans since 2000 but was absent from the alliance in support of New-IP.

CONCLUSIONS

As mentioned in the introduction, China is open about its desire to see a cyber sovereign vision of the internet catch on in the international community. Huawei's proposal of New IP seems to be a step in that direction both because it was proposed at the UN's ITU (instead of the non-governmental standards forum, IETF), and because of the allusions to greater sovereign control in the documents' discussion of "many nets". However, the diplomatic mechanisms by which China aims to shape this debate are unclear. Our analysis of China's policy documents describing the ambitions and scope of the DSR yielded little insight into how much money would be devoted to the DSR, whether it has a timeline, what its financing mechanisms are, or even what its geographical scope is. Nevertheless, by leveraging publicly available data on Chinese technology loans to Africa we were able to make several interesting observations.

Firstly, there is no strong evidence of the DSR or Chinese lending relating to African votes at the ITU. This is important, because by ruling out loans as an explanation for African votes at the ITU we are left with two possibilities. Either, China has successfully convinced African counterparts of the importance of their proposal through other diplomatic means; this could be the subject of further research. Or, a more likely scenario is that many African countries may consider China's propositions to be innately appealing. In other words, China's proposals would be pushing on an open door. Although the New IP proposal submitted by Huawei is short on details, the allusion to "many Nets" being under greater control of national governments may be enough of a draw. Indeed, one of the countries issuing its public support of New IP in 2020 was Nigeria; a country that in June 2021 banned Twitter and has been compared with China for the censorship model it is developing.[49]

Secondly, we found that Chinese lending for technology or DSR-related loans was actually much greater before the initiative was launched in 2015, than after. This decline in lending is actually part of a much broader decline in Chinese lending to Africa that began in the middle of the second decade of this century.[50] However, this raises questions about what defines the DSR and who will finance its construction if it is more than just an abstract concept. It is possible that it is largely a successful public relations campaign at this stage.

Lastly, by looking at the ITU data, we found that despite their significant power in a one country, one vote system such as the ITU, African countries seldom engage. Although the ITU still has no significant power over how the internet is governed, these collaborations between some African countries and China represent a growing coalition of discontent towards the current multistakeholder model of internet governance. ★

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