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Between highways and fintech platforms: Global China and Africa's infrastructure state

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ABSTRACT

In this paper, we juxtapose two different sectors of China's economic presence in Africa: transport and digital infrastructure. Using the case of Kenya, a country that hosts several flagship corridors funded by Chinese loans and where Chinese "digital champions" have been active for two decades, we highlight some of the differences and similarities between these two forms of China's going-out capitalism in the continent.

Our argument is that these 'varieties of capital' are conterminous, and they operate through both strategic and contingent overlaps within the same 'state-market nexus' and at the interface with programmes and goals of the African 'infrastructure state'. To illustrate this point, we draw on a comparative research effort inspired by a growing body of scholarship that has been labelled under the tag of 'Global China' and by a political economy reading of 'the market-in-state' system. This paper thus contributes empirically and conceptually to de-essentializing the Chinese presence in the African continent by recognizing the contextual agencies that shape it—the ambitious developmental agendas of the African state, in particular—as well as the interplay between its different corporate forms.

1. Introduction

The notion of 'Chinese infrastructure' investment in Africa is commonly associated with images of expansive construction sites, bringing radical change in the physical landscape of both urban and rural settings. Highways, railways, and ports built by Chinese companies and funded by Chinese loans are the visual currency of an almost two-decade-long transport infrastructure bonanza in several African countries. While these projects have been sometimes celebrated as achievements of developmental, south-south cooperation, they have also been critiqued for leading to displacement, restructuring of land ownership, increasing debt pressures, and a reconfiguration of local governments' fiscal and everyday politics (See Wang & Wissenbach 2019; Goodfellow & Huang, 2021; Zajontz, 2022). Less visibly, however, China has also been an important funder and contractor of digital infrastructure, including the hardwired broadband that now provides the regional and global backbone of Africa's Internet connectivity. Moreover, Chinese technology companies have also radically diversified their African footprint, supporting the development of local innovation through

entrepreneurial incubators, venture capital facilities, and offshored R&D (research & development) units.

In this context, Chinese capital flowing into African transport networks and into digital infrastructure has generated two different kinds of anxiety about the presence of China in the continent. Investments in mobility corridors have elicited debates about debt-trap diplomacy, resource extraction, labor rights, and economic sovereignty (Brautigam, 2011; Zajontz, 2022). In contrast, ICTs have shored concerns about authoritarian surveillance, espionage through digital backdoors, and data privacy (e.g. Gravett, 2020). Both avenues of anxiety, however, are often predicated on the same "essentialist" frame that, as Franceschini and Loubere write (2022), places China as an authoritarian outsider of global capitalism. As a result, most analyses of the Chinese presence in Africa tend to prioritize the interests of the Chinese state over the complex local politics that productively shape such investments.

While it is important to understand how infrastructure investments in the continent, both under the Belt and Road initiative and under the so-called Digital Silk Road, have been a response to China's need to find a geographical fix to domestic overcapacity (Taylor and Zajontz, 2020),

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and to promote an alternative model of Internet sovereignty globally (Gagliardone, 2019; Negro, 2020), our analysis in this paper moves in a different direction. We foreground how the African “infrastructure state” (Schindler et al., 2022) has engendered the overlapping value chains of different “varieties” of Chinese capital landing in the continent (Lee, 2017).¹ Our argument, which builds on a comparative analysis across the transport and ICT infrastructure sectors, is that these investments are often conterminous and they operate through strategic, contingent, and sometimes serendipitous overlaps, within the same state-market nexus (Zheng & Huang, 2018) and at the interface with the programmes and developmental goals of the African “infrastructure state” (see Schindler and DiCarlo, 2022).

More specifically, in an effort to de-essentialise China’s “infrastructure-led development” in the continent (Schindler & Kanai, 2021), we draw a comparison between the transport and ICT sectors in Kenya, a country that hosts several flagship mobility projects funded by Chinese loans, and where Chinese “digital champions” have been active for nearly two decades. Despite the different varieties of capital that underpin these two infrastructure sectors (most visibility, the fact that one is dominated by large state-owned corporations and the other by a wider spectrum of companies), we show how these investments overlap at the confluence with the ambitious schemes of Kenya’s ‘infrastructure state’. With the latter, as we detail in what follows, we do not just refer to a specific paradigm of government interventionism which seeks to achieve macroeconomic goals through the delivery of transnational infrastructure systems (Schindler et al., 2022). Rather, we apply the term “African infrastructure state” to a more amorphous set of domestic economic planning strategies that have long shaped developmental statecraft in the continent (Mkandawire, 2001; Croese, 2017; Cirolia & Harber, 2022), through a diversity of spatial initiatives and with different degrees of success.

In making this argument, we are inspired by a growing and diverse body of work that has been grouped under the label of ‘Global China’ (Lee, 2017). In short, Global China scholarship has indicated conceptual, empirical and methodological directions, some of which are germane to the contribution of this paper. First and foremost, this research agenda suggests that there cannot be a single political economy question when looking at the internationalization of the Chinese state and Chinese companies because Global China manifests through the multiple centrifugal forces that shape its geoeconomic, geopolitical and “geocultural” power (Winter, 2022). Relatedly, there is more than the Chinese state in Global China: a myriad of entrepreneurs, private companies, investors, experts, and elite networks shape China’s overseas footprint: at times, these networks use the Belt and Road Initiative (BRI) and other going-out strategies as bridgeheads; at times, they precede them; at times, they are completely disconnected from policy goals. For this reason, as Lee (2022) suggests, the challenge of Global China’s research agenda is to remain open to both aggregate-level analyses and grounded empirical work. This is of particular importance in our study of the Chinese presence in the African continent, where overemphasizing China’s geopolitical goals comes with the upshot of infantilizing African states and peoples as unwitting victims of neocolonial logics.

And finally, Global China calls for a comparative research effort: it requires multiplying the sites of comparison within and between its modes of existence—taking to heart the notion that “only by understanding global capitalism can one understand China” and “only by understanding China can one understand global capitalism” (Franceschini & Loubere, 2022, p.8), in Africa and elsewhere. This is relevant for this paper, insofar as we draw on the Global China scholarship not to write about China itself but about the landing of two types of ‘Chinese infrastructure’ investments in Africa, and in Kenya in particular. Ultimately, the key question that this paper addresses is how the

overlapping value chains of different forms of Chinese investments in infrastructure systems are primed not just by their own commercial interests but also by the schemes that the Kenyan state produced to give effect to its vision of development.

The case of Kenya is emblematic for a number of reasons. In many ways, Kenya is a template of the African “infrastructure state”, having long enshrined the construction of material/spatial systems as a key domestic agenda aligned to the triple goal of extending networked service delivery to the whole population, boosting the economy through labour-intensive projects, and attracting foreign investments and loans. We can trace this approach to at least the early 2000 s, when the World Bank- and Donor Consultation Group-backed *Investment Programme for the Economic Recovery Strategy for Wealth and Employment Creation* (known as ERS) became the national framework for Kenya’s infrastructural ambitions (2003–2007). It was followed by the 2008 *Kenya Vision 2030*, an ongoing, nation-wide development plan which aims to achieve a middle-income status for the country by 2030. Prioritized in this latter plan are a number of infrastructural strategies and spatial corridors that have since, as we detail later, functioned as a landing pad for Global China’s corporate interests.

The case of Kenya demonstrates the political renaissance of infrastructure development at the center of national and regional development agendas in Africa, where the state and arguably its various agencies pursue objectives and developmental goals through the mobilization of foreign loans (Schindler et al., 2022). Despite the apparent power asymmetry in the conjunctures of China-Africa engagement, African state actors are in fact able to exert agency at different levels (Chiyemura et al., 2022). This paper therefore also contributes to an understanding of what constitutes the “Africa infrastructure state” in the articulation with the Chinese presence.

After this introduction, we turn to the current scholarly landscape concerning the state-market nexus of Global China in Africa, drawing both comparisons and linkages between the transport and ICT infrastructures to unpack the complex interface between Chinese (state) capital and other contingencies. The third section briefly reflects on some of the methodological implications of Global China’s comparative research agenda and how it materialized in the case of our research. The fourth section lays out the empirical analysis of the diversified and interconnected actors of Chinese infrastructure capital in Kenya, with case studies ranging from highways to new financial infrastructures built by fintech startups. Overall, as we detail in the conclusion, our contribution is twofold. Conceptually, we bring into the framing of Global China strands of scholarship that are rarely read side by side, from the political economy of “market in state” (Zheng & Huang, 2018) to studies of digital China (Hong, 2017) and its global integration (Hong & Harwit, 2020; Shen, 2018; Tugendhat & Voo, 2021). Empirically, we underscore the importance of strategic and contingent encounters with the African infrastructure state as sites where these varieties of capital overlap, and, in turn, shape and are shaped by its ambitions.

2. The state-market nexus going global

This paper responds to the invitation to study Global China in a comparative manner, not by contrasting Chinese and non-Chinese investment in Africa, but by juxtaposing transport and digital infrastructure capitals to illustrate their different yet interlinked and overlapping practices. The reason for separating transport and digital infrastructure is not ontological. After all, ICTs rely on networks that carry electric signals and radio waves. While there might be many reasons for this emic² distinction between the “physical” and the “digital”, we keep this separation here because it best reflects the flux of state-capital relations of Global China.

¹ In this we echo a point made in various contexts by scholars such as Croese (2017), Tan Mullins et al (2010), Kimari & Lesutis (2022) and others.

² For example, the African Union’s Infrastructure Consortium for Africa distinguishes between mobility, water and sanitation, electricity and ICT infrastructure investments.

Specifically, as a response to the boom of the tech sector both globally and in China, the 13th Five Year Plan promulgated in 2016 earmarked the ICT sector as one of the country's top priorities, a clear shift away from the so-called "traditional" infrastructure (Hong, 2017). At the 2018 Central Economic Work Conference, the term "New Infrastructure Construction (NIC)" was coined to describe a new mode of development driven by innovation in information technology (Gu et al., 2021). This domestic shift in policy incentive and state capital towards ICTs³ happened in parallel with the drop of bilateral loans from policy banks from China to Africa, which had typically concentrated in transport infrastructure and related projects (Carmody & Wainwright, 2022). Such a shift compels us to compare these two sectors despite their vague ontological separation, because it reflects the ways in which state policies have drawn a line between "traditional" and "new" infrastructure, and sought to incorporate the Chinese digital industry into other kinds of initiatives.

Differences in state-market dynamics between these two are noteworthy when it comes to understanding the origin and nature of their financial flows. While Chinese capital invested in transport infrastructure might not be transparent, it is easy to chart its linkages to state ownership and its government-backed capital export regime. This is because the majority of Chinese finance in transport infrastructure in Africa has been channeled through policy banks and implemented by SOEs. With ICT investments in Africa, instead, it is often hard to tease out their Chinese component. Some of the financing entities mobilize offshore companies and multiple financial vehicles to channel funds into the African market, merging with other global players on the way, and making the 'Chinese content' hard to distinguish when it lands in the African market, even when the finance originated from China. Similarly, venture capital funds may have several Limited Partners (LPs), often from different jurisdictions. When these companies and funds invest in African tech infrastructure and companies, do they, and how much do they count as Chinese capital?

The impossibility of parsing Chinese technocapital from transnational technocapital echoes a point made by several scholars of Chinese global Internet, who have argued that the two are so inextricably imbricated that they constantly shift and challenge state-market dynamics (Hong, 2017; Schiller, 2014; Shen, 2018; 2019; Tang, 2019; 2020; Wen, 2020; Zhao, 2010). And although it is true that, as Zheng & Huang point out (2018, 32), any private market in China "must live within the boundaries set by the state in order to survive", as it became painfully clear during the recent reign-in of technology companies (Chen, 2022), it is equally important to recognize that digital corporations, even within these boundaries, have seen a unique participation of foreign private capital in shaping their foreign investment practices. For example, China's largest tech corporation Tencent received a hefty investment from a South African legacy media company, Naspers, which later went on to list its digital investment business (which includes almost a third of Tencent ownership) on the Amsterdam stock exchange. As Jack Qiu and his colleagues have recently summarized, the geopolitics of "Chinese Internets" have been plural and complex in their global interplays (Qiu et al. 2022).

Hence, the most discussed difference between transport and digital infrastructure investment is the fact that in the former the majority of companies operating in Africa are subsidiaries of SOEs, whereas many of the Chinese tech companies that have gone global in the last decades—from Alibaba to Tencent—are not state companies, and have done so by raising foreign private capital and by situating themselves in a grey area of China's corporate law through profit-sharing frameworks of various sorts (Negro, 2018).

This doesn't mean that transport infrastructure financed by China is implemented by state actors alone, or that ICT investments are run by

private actors only. In fact, state and private actors are active in both sectors, and within the same actor the boundary between state and private could be blurred. For example, Huawei (the largest provider of ICT equipment in Africa) is not technically owned by the Chinese state, but is considered a very powerful vehicle of China's globalizing state capital, even though Huawei's foray into Africa was initially a response to the company's difficulties in negotiating its place in the domestic market, as well as contradictions in its accumulation strategies (Wen, 2020). So whilst Huawei did not enjoy the same kind of support received by other state-sponsored ICT companies such as ZTE, Shanghai Bell and China Mobile, all of which became the forefront of China's digital expansion in the early 2000s, it did benefit from positioning itself as a digital champion aligned to the country's geopolitical interests (Wen, 2020). At the same time, the African subsidiaries of state-owned construction and engineering companies have a mandate to operate as commercial enterprises, which makes their "profit-optimization" (Lee, 2017) appetite not dissimilar to that pursued by Chinese ICT players. In fact, as Shen points out (2018), it was a similar concern with cutting industrial overcapacity that brought ICT companies into the Silk Road framing for going out.

The blurred boundary between the state-owned companies and the private ones brings to our attention a recurring debate over ownership and control. As Lin argues, corporate law in China uses categories and taxonomies that do not neatly map onto those that characterize Western corporate laws (Lin, 2021). Furthermore, there are private companies that have assumed state functions to achieve developmental policy goals that go beyond the western notion of corporate social responsibility. As Pearson et al. (2023) have discussed, state ownership does not necessarily determine the degree of state control. Specifically, Zheng and Huang (2018) showcase at least three different layers through which the Chinese state gives effect to its "market-in-state" system⁴ (one under the direct control of the state, one navigating islands of bounded autonomy, and one in-between that escapes the private-public dichotomy). Across these layers, the economic goals of the state are enacted by harnessing and balancing the degree of autonomy afforded to different markets.

Central to this discussion is Zheng and Huang (2018)'s concept of the "middle ground", which describes the space in which different actors interact, where the state either "partners" with the enterprises to offer indirect support for its production, or recruit them as an "agency" to implement developmental goals. When going global, however, such practices have arguably diversified and evolved into varied forms, and have been shaped by the interface, in our case, with the domestic agendas of the African infrastructure state.

A good example of this diversification is the shifting role of Chinese SOE contractors in the delivery of transport infrastructure in Africa, which benefited from the initial support of policy banks and MOFCOM, all executive agencies of the State Council (Brautigam, 2011; Huang & Chen, 2016). Today, however, the implementation of infrastructure projects in Africa is mostly driven by the thrust of the SOE contractors themselves. This has translated into the emergence of alternative practices of public-private partnerships (PPPs), for example through Build-Operate-Transfer agreements, in which competitive construction companies mobilize their own resources to become financial partners with African governments, often for long contractual periods. Chinese SOEs

⁴ Rather than referring to the current debate on "new" state capitalism, here we prefer to use Huang's and Zheng's work, which brings into sharper focus the state-market dynamics of capitalism in China. The so-called "rise of China" has indeed inspired a burgeoning scholarship on state-led capitalism, re-ashing a long-standing debate of marxist analysis, from Gramsci to Poulantzas, for what concerns the role of the state in capital accumulation. While this work is important, we equally believe that it is fundamental to read this scholarship alongside the writings of East-Asian scholars who embed their analyses into more specific and historically grounded frames of reference, as useful constitutive outsiders to western-centric political economy (see also Weber, 2023).

³ In parallel, the ICT industry also received a strong domestic push through initiatives such as the "Made in China 2025" and the "Mass entrepreneurship and innovation" programme (see Zhang, 2023).

also bid on turnkey projects funded by other geopolitical players, ranging from the World Bank to bilateral DFIs such as Japan's JICA or South Korea's KOICA. Through these diversified contracting practices, the SOEs are able to execute their "improvised autonomy" (Ang, 2016) in Africa, while maintaining their liquidity competitiveness through the government-backed "capital export regime" (Camba, 2020).

Conversely, many non-state ICT companies going out did so thanks to foreign financial resources, which came in the form of private venture capital. In fact, as Min Tang explains (2020), foreign bids in Chinese software giants were foundational to their expansion and their current role in outbound transnational digital investments. In this context, Africa has been a relatively minor destination, given that the slice of global venture capital directed to the continent is still small (only around USD 6bn went to African startups of more than USD 600bn in 2021). Yet, not only is Africa the fastest rising VC region globally, overseas Chinese investments have had a radical impact on the continent's digital ecosystems, ranging from Africa's most used Web browser (Opera mini, owned by a conglomerate of Chinese investors - Golden Brick Capital) to its best-selling phone brands (Transsion and Xiaomi) —all of which is arguably part of the continent's rush to the so-called "4th Industrial Revolution" (African Union, 2020).

In these circumstances, the juxtaposition between Chinese investments in transport and ICT infrastructure in Africa brings to our attention the fact that Global China consists of "heterogeneous processes and actors" that need to be disaggregated (Lee, 2022, p.316). On the one hand, SOEs are often identified as a main driver of state capital "going global", and their activities are interpreted as a mingling of corporate interests and political agendas of the state (Huang & Lesutis, 2023). On the other hand, there are private and employee-owned ICT companies which are beyond the immediate control of the state, yet their relations with it are nuanced and fast-changing (Chan, 2022; Zhang & Chen 2022).

Beyond the different levels of state influence, there is also diversity in the size of Chinese firms operating within the same nexus. In Africa, scores of small and individual Chinese enterprises have long constituted one of the often overlooked forefronts of Global China in the continent (Gu, 2009). More importantly, within the state-market nexus of Global China, the various actors interact in varied ways, sometimes competing with each other, sometimes enabling new initiatives and partnerships, making the interface between the state and the private sector extremely complex. It is through these processes that state and private interests from China, however channeled through these companies and their investments, meet and blend with the interests of African domestic capital and infrastructural statecraft, applying complex agencies within their "bounded autonomy" (Breslin & Zhongqi, 2021) and generating various grounded integrations (Klinger & Muldavin, 2019).

3. A note on method

The material we present in this paper is the collective result of three years of field research in Kenya and East Africa, more broadly. It draws on interviews, field trips, surveys, and ethnographic and archival work conducted separately by the two authors, across different projects and with different research questions in mind. Had we not met in the early days of 2022, over lunch in a leafy suburb of Nairobi, this article would have never seen the light of day. Neither would we have been able to craft our shared argument that different varieties of infrastructure capital operate at the encounter of the Chinese state-market nexus and the African infrastructure state—an argument, we believe, that contributes to de-essentializing the Chinese presence in the continent while recognizing the contextual agencies that shape it, and the complex interplay between its different corporate forms.

The starting point of this paper was a note-comparing exercise between the authors on their experiences researching different kinds of Chinese capital and their respective forms in East Africa. In other words, the very possibility of this paper's insights is not borne out of a single

research agenda but, as asked by Global China scholarship, out of a comparative effort (Lee, 2022). This comparative effort, which for us meant juxtaposing research materials and qualitatively tracing resemblances and divergences, is also a function of diverse positionalities, languages, collaborations, and friendships among those who study the grounded forms of Chinese capital in Africa. We write this essay as a Chinese scholar who lived for long periods in East Africa and an Africa-based European researcher. Thus, we are cognizant of the linguistic and financial privileges that granted us entry to our fields and the asymmetries of an encounter in which Africa is not represented. We are also deeply aware of another "otherness", as captured by Zheng et al.'s (2021) work on the struggle of Chinese scholars having to take sides when researching China-Africa conjunctures.

In other words, blind spots are inevitable. Our access, after all, depended on the subjective, mundane command of shared vocabularies, whether this meant Mandarin fluency, or the tech lingo acquired over many years of research with startups and venture capital investors in Africa. While fully unpacking how comparison narrows and expands across these dynamics would require more space than we have here, it is worth noting how most of our interviews⁵ and ethnographic work were conducted separately, with only two instances in which we joined forces. To write collaboratively, we collated several diary entries and snapshots from the field, which we then distilled into the few that punctuate the next section of the paper. This work of refinement was also supported by a group of scholars in the field,⁶ whose initial feedback on an earlier manuscript draft helped us hone the analysis and argument of this paper. From very diverse and disparate materials, we selected those that most clearly spoke to our concerns with the grounded integrations of Global China and Africa's infrastructure state.

4. Capital overlaps: A view from Kenya

In this section, we craft two narrative analyses to showcase the dynamics of the state-market nexus of Global China and how it lands in Kenya, meeting the country's infrastructural ambitions. As one of the first signatories of BRI agreements in Africa, the East-African country hosts some of its flagship projects, including the Nairobi-Mombasa Standard Gauge Railway (SGR) and the Mombasa Container Port. Finally, Kenya is also a major destination for private Chinese companies, thanks to its stable economy and relative ease of doing business (in the top three in Africa, if we exclude island nations like Mauritius), owing to a mixed record of structural adjustments programs and subsequent market reforms that culminated with those of *Kenya Vision 2030* (which included a number of programmes to overhaul and streamline the country's corporate regulations). As of 2021, the Kenya-China Chamber of Commerce (KCCC) featured more than 400 entities as members, with a majority of private enterprises.

The first part of this section charts two parallel urban infrastructure projects, one transport corridor that cut through the centre of Nairobi and a greenfield 'smart city' in the outskirts of the capital, a special economic zone whose digital infrastructure was built by Huawei. Our argument is that not only do these two investments, while seemingly separated, overlap but they are framed within the same overarching programme of the Kenyan infrastructure state. The second section moves to the deeper interconnections between different varieties of Chinese capital - the large scale SOE, the private big tech company, and the small startup. These different corporate forms underpinning various ICT projects, we will show, interact more than what would appear as obvious, but they do so in ways that are both strategic and contingent, in

⁵ These included around 20 interviews with Chinese managers working for state-owned construction enterprises, Venture Capital representatives from China, Kenya and elsewhere, interviews with both Chinese and Kenyan startup companies whose businesses were in relation to Chinese ICT platforms.

⁶ Named in the paper's acknowledgements.

other words dependent on unique local circumstances that blend geopolitical goals, domestic developmental policies and personal histories.

4.1. The expressway and the data centre

In April 2019, Kenya and China signed project delivery commitments for two major infrastructure projects in and near its capital city of Nairobi. The agreement identified Huawei as the contractor for “Konza data centre and smart city project”, for a total of KSh17.5 billion (USD 172.7 m) financed with a concessional loan from CHEXIM. It also announced that the China Road and Bridge Corporation (CRBC) would itself fund and build Nairobi’s expressway, at a cost of KSh 50 billion (USD 500 m). First appearing in planning documents in the late 2000 s (Guma et al., 2023), the Nairobi expressway is a 27 km-long, elevated highway connecting the country’s main airport to the city central business district and wealthier western suburbs. Its purported goal, aligned with Vision 2030’s pillar of decongesting Nairobi through a series of bypass arteries (Cirolia & Maina, 2023), was to reduce travel time between Nairobi’s commercial centre and logistic hub. It was also the last large-scale project of Kenya’s outgoing president Uhuru Kenyatta, who had made ambitious infrastructure delivery a signature of his tenure as president. Despite the several controversies that surrounded it (Mulwa, 2019; Kimari, 2021), CRBC built the expressway in record time, and opened it in May 2022, only 2 years after construction began.

Conversely, the Konza project has had a much longer gestation period. Also conceived as part of the national development plan that was launched in 2008 (Kenya Vision 2030), and later on included in the metropolitan masterplan (Guma & Monstadt, 2021), Konza Technopolis is a 2000-hectare, greenfield new town gazetted in Kenyan law as a special economic zone for the enhancement of the BPO (business process offshoring) and ICT sectors. To this end, while the full extent of the project has not been developed yet, its digital backbone, including the national data centre, was built by Huawei and went live in the middle of 2022.⁷

To most people, including the Kenyan newspapers that initially reported on the agreement (e.g. Nation, 2019), these two projects seemed to be sponsored within one package of state finance from China. In fact, they reflected different financing mechanisms and delivery models. While CHEXIM offered a bilateral loan for the Konza project, CRBC had to raise its own money for the construction of the expressway, despite being one of the biggest SOE contractors from China. On the same occasion, CHEXIM withdrew its support for the expansion of the SGR to Kisumu and to the Kenya-Uganda border, in completion of what President Kenyatta called “the Golden Belt of the BRI” in East Africa (APA News, 2019).

In other words, a private company (Huawei, albeit with all the caveats mentioned earlier) managed to access concessional finance, while a state-owned contractor (CRBC) had to resort to alternative sources of capital, and was cut short of its ambitions to bid on the last phase of Kenya’s largest Chinese-funded infrastructure to date. CRBC did however underwrite non-concessional loans with CHEXIM and with other financial institutions in China. Using a PPP model and becoming the sole partner with the Kenyan government and without the burden of a

bilateral loan, CRBC avoided the complexity of sovereign guarantees,⁸ and will recoup its investment in the highway through a toll-based build-operate-transfer type of agreement.

This transition of financing methods and changing role of CRBC from the driver of a BRI flagship project (SGR) to the developer of a PPP project in Kenya may be described as a result of what Tsing (2005: 27) has called “productive friction” (see also Bhamidipati & Hansen, 2021). The SGR project had not only been a distinctive case of spatial fix of Chinese state capital, but also a learning curve for CRBC’s encounter with the Kenyan government and society. As one CRBC senior manager who oversaw the completion of both the SGR and the expressway put it:

We knew nothing about PR [public relations] in Kenya and in Africa in general, when the SGR project commenced. When a crisis occurred, we had no effective tool to tackle it. At home we learned to manage the relations with the state, and that knowledge is useless here. It cost us a lot of time, money, and reputation, to finally get to where we are. Now we have built partnerships with several local PR companies, and pay them for their services. We realized that most times local problems need local solutions. It’s one of the most important lessons we learned from the SGR project. [Transcribed from an interview in Chinese, July 2022]

Concerning the reputational risks of advertising the SGR project as a Chinese project in Kenya, CRBC decided to use a Kenyan “proxy” when it received the contract to operate the SGR for a designated period of time. CRBC repackaged the operations department of the company into *Africa Star Railway Operation Company*, mostly managed by Chinese personnel but represented in Kenyan public and social media almost exclusively by Kenyans. Drawing on this experience, CRBC created *Moja Expressway* as its proxy to run the operations and maintenance of the expressway. *Moja* is entirely owned by CRBC. Yet, as its kiSwahili name suggests, *Moja* is described as a Kenyan company, both in its employment practices (mostly hiring locals) and in its social media presence. Such a strategy softens CRBC’s relations with local business partners and customers, while also veiling and diluting the “Chineseness” of the fee-based revenue model that will link Kenyan road authorities to CRBC for many years, and through a project that was ridden with controversies and “anxieties” from the start (Kimari, 2021).

On the contrary, the presence of Huawei in Konza is not hidden, as captured in the vignette below.

For many years, Konza Technopolis was mocked as a pipedream, a fantasy city, an ambitious delusion. Adding to the ridicule, the white building destined to the Kenyan ICT ministry, and built by a Chinese contractor, stood empty like a white elephant in clear sight from the busy highway that connects Nairobi and Mombasa. Today, however, not only is the building bustling with life, hosting the Konza Technopolis Development Authority (KoTDA), it is also surrounded by an immense construction site, with cranes and trucks dotting the horizon as far as eyes can see. While we are escorted to a meeting room for a presentation, we walk past an entire floor branded by Huawei. Engineers and developers are absorbed in their tasks, their faces buried in several rows of shiny new desktops. Later on, when we are taken to a tour of the new national data centre, the presence of Huawei is ever clearer, each server cabinet labelled with red flowers [field notes, June 2022].

In fact, although the data centre is called ‘National data centre’ because it will centralize a number of cloud-based services of various departments and ministries, the facility as a whole has space for other cloud providers, including Huawei, which reserved part of the building for its own cloud. This is not uncommon for data centres, as centralized colocation is key to reducing latency and facilitating in situ connections between different companies, and between them and government (this

⁷ Note that the data centre is only a microcosm of the broader geopolitics of infrastructure capital that Konza embodies (see Pollio, 2023). The construction of the smart grid upon which the entire city relies was awarded to an Italian contractor, with a loan by an Italian parastatal to the National Treasury. Meanwhile, the Thwake dam poised to provide water and electricity to the new city was funded by the African Development Bank, an upgrading of the section of the highway connecting Konza and Nairobi’s southern end was partially supported by the World Bank, and the Kenya Advanced Institute of Science and Technology (KAIST) received technical and financial support by the South Korean government.

⁸ In a nutshell, sovereign guarantees are state-backed contractual obligations that derisk debt financing in case of default of the principal obligor (in this case, the Kenyan treasury).

is, after all, the business model of data centres). Huawei not concealing its presence is perhaps a consequence of the fact that spaces like data centres or control rooms are rarely visible to the broader public. But a senior Huawei executive also observed that, in its twenty years of operations in Kenya, the company had never been involved in serious controversies, and that public officials had an extremely positive view of the company, despite the push for delinking coming from US authorities (personal conversation, August 2021).

The executive also pointed out that since the 2014 memorandum between Huawei and the Communication Authority of Kenya, the two had even acted as partners to envision and deliver the country's ICT Master Plan of *Vision 2030* (personal conversation, August 2021). This developmental partnership is also key to gradually bring the emerging Kenyan tech ecosystem to Konza: having won a nation-wide call, the first users with free access to the National data centre were ten civic-tech startups building software that explicitly aligned to the smart city goals of *Vision 2030* (personal conversation with KoTDA official, June 2022).

Together, Konza's data infrastructure and Nairobi's expressway reveal how Chinese capitals of different forms and through different channels encounter the developmental agenda of the African infrastructure state, and mould themselves to strategically intersect it. Despite their different financial structures indicating a shift in the operations of the Chinese state-market nexus in Africa, both projects dovetail long-standing goals of infrastructural statecraft in Kenya. In fact, it is not just that these two large-scale infrastructures were announced within the same delivery agreement to be relevant, but the fact that different varieties of Chinese capital are conterminous within the same overarching vision of local economic development, in this case *Kenya Vision 2030*. CRBC managed to use the 'decongesting Nairobi' goal of the plan to achieve its own corporate agenda and further solidify its role as a key government contractor (all the while creating proxy companies to soften its Chineseness to the eyes of Kenyans); similarly, Huawei built on its existing partnership with the Kenyan ICT ministry to expand its market from connectivity equipment to more sophisticated cloud infrastructure services, all of which materialized in one of *Vision 2030's* flag-bearing projects.

4.2. The SOEs and the small startups

Thus far, we have seen how transport and ICT infrastructure capitals from China, while operating within the same yet shifting state-market nexus, are also primed by the goals and programmes of the Kenyan state in large-scale projects. We now turn to another way in which the infrastructure state engenders both strategic and contingent overlaps between different varieties of Chinese capital, and at a much smaller scale. Specifically, we chart how the ICT development programmes of the Kenyan government have created the conditions for smaller Chinese and Chinese-funded tech companies to operate in the value-chain of larger contractors such as CRBC and to intersect existing domestic markets.

To understand the background of this phenomenon, it is important to note that at least since *Vision 2030*, as already mentioned, ICT has been a key area of intervention for Kenya's 'infrastructure state'. Today, with innovations such as M-Pesa, the ubiquitous mobile-money payment system (see Guma & Mwaura, 2021), a relatively high Internet penetration, a growing cluster of digital companies servicing pan-African markets, and world-famous incubators such as Nairobi Garage and i-Hub, Kenya is often heralded as one of Africa's leading 'silicon savannahs' (Rosenberg & Brent, 2020). Together with South Africa and Nigeria, the country grabbed the majority of global venture capital invested in African digital companies in 2021 (Partech Partners, 2022), a trend that continued to grow in 2022.

This capital rush builds on the back of almost two decades of government-backed supply-side investments in the delivery of digital infrastructure (Cirolia et al, 2023). With all its contradictions and

blindspots (for example the fact that many Kenyans have physical access to world-class Internet services but cannot afford them), the incredibly proactive ICT ministry laid the fundamental groundwork for the current boom of digital companies seeking to enter a variety of markets, from the financial sector to agriculture (Ndemo & Weiss, 2017). In this process, as one of our informants noted, the managed competition between ZTE (state-owned) and Huawei (employee-owned), and between these two and other Western companies, has been essential:

Tucked away from the busy traffic of Ngong Road, not far from what locals call Nairobi's Chinatown, the pool garden of a Hilton hotel offers a quiet respite from the blaring surroundings. Han has chosen this spot because a few steps away, on the glazed top floor of another building, a Chinese hotspot restaurant remains open past curfew hours. The plan is to have dinner after our interview, which will be about his long experience as a sales manager for ZTE - the state-owned network equipment provider that has rivaled Huawei in the delivery of broadband in Kenya. During our long conversation, he jokingly discusses the fact that both companies have been in Kenya for almost twenty years, but only recently people have taken notice. "It's funny", he says, "to think how much of what is happening today is because of what we started when we won our first tender with Telkom" [the then government-owned telco]. He later elaborates that the Kenyan government and private sector had used the competition between ZTE and Huawei to deliver widespread connectivity: to make his case, he lists the current prices of a 5G base station. Huawei, 5 k USD. ZTE, 5 k USD. Nokia, 15 k USD. [field notes, August 2021]

Han's ironic remarks speak to a number of ways in which state and private capital intersect within ICT infrastructure financing itself. Going back to 2006, the year in which CHEXIM's first two loans to Kenya were reported, one went to the construction of a highway, and another one went to a rural ICT project, showing that from the very beginning of China's lending to Kenya digital infrastructure was already a priority of the government. Soon after, CHEXIM became a fundamental partner of the Kenyan treasury in the delivery of NOFBI, the National Optic Fiber Backbone Infrastructure. The latter is one of the most celebrated achievements of *Vision 2030*. It received three loans from Beijing, as well as additional funding from the government, to extend hardwired broadband coverage to the entire nation, including remote counties.

The availability of good connectivity, an extended payment infrastructure (M-pesa), combined with the private sector reforms started with the ERS and continued in the ongoing plan, have attracted and spurred hundreds of smaller tech companies. Some of these companies are founded by Kenyan returnees with experience in the global tech industry; others, by Western expatriates seeking to build tech solutions for frontier markets; some are tech startups that operate within or in adjacency to the value chains of large Chinese corporations, both in the ICT sector and beyond. A good example of this is *Easytransfers*,⁹ a startup co-founded by Chinese and Singaporean expatriates in Nairobi:

Oliver and I have coffee at Ikigai, an upscale coworking space where it's not uncommon to see Chinese and other foreign startups. I have already interviewed his boss, Michelle, the cofounder of a fintech platform (Easytransfers) that seeks to facilitate cross-border payments between Africa and China. Since then, the app has gone live and they are already processing hundreds of transactions, thanks to partnerships with a couple of state-owned contractors, to which they offered an easy way to pay remittances from Kenya into Chinese bank and WeChat accounts. But Oliver points out that the employees of construction companies are only the beginning. In fact, their next target customers are the numerous Chinese entrepreneurs that came to Africa on the back of these companies and stayed in the continent to start their own businesses, whether it's a small restaurant or a FMCG import operation. After them, Easytransfers will expand its services to Kenyan shop-owners who trade in Chinese

⁹ Pseudonym.

commodities. All these businesses increasingly need to settle payments with China, Oliver explains, and our conversation goes on about the inextricable story of what he calls “the big infrastructure” and the “digital channels”. [field notes, June 2022].

The snapshot above shows how the financing of large-scale transport corridors meet new digitally enabled financial corridors. As Oliver pointed out, state-owned companies, especially construction and engineering SOEs, have brought hundreds of employees to Kenya. According to his market research, on average three hundred thousand Chinese people had been living in the country in the previous five years, albeit with different degrees of stability. Like any other expatriate, they too need digital services connecting to their home and their families. They are therefore potential customers for digital solutions such as remittance fintech platforms. A number of these companies have already existed for a few years, but many more are sprouting in Nairobi. Often funded by Chinese private investors, these fledgling startups illustrate how the state-capital spatial fix in Africa, and in Kenya in particular, has generated innovative arenas for high-risk investment outside of the traditional sectors for which infrastructure loans were made. In other words, the interface between the Chinese state-market nexus and the Kenyan infrastructure state has created corridors of opportunity for other Chinese players, many of which are small, bootstrapped companies addressing niche markets with scalable digital products.

In fact, as Oliver further explained, the cross-border payment infrastructure he was busy creating had used the highly regulated SOE ecosystem as a testbed to pilot their solution with the goal of expanding to other existing markets, such as the numerous small Kenyan shop-owners trading Chinese commodities and needing a solution to settle payments with their agents in China. The available options are currently limited: SWIFT-enabled international transfers have a high rate of bounce back, and are very costly; so too are unregulated options, such as the Hawala system of people-to-people banking, which add a further layer of risk to cross-border transactions, at a time when Chinese authorities are clamping down illegal financial flows.

Anecdotal, *Easytransfer's* major competitor to date is a Kenyan-funded startup, *Mamapay*, which also received funding from a private Chinese investor. With the same target market, and an uncannily similar expansion strategy starting from SOEs and branching out to local traders (Interview with the company's CFO, May 2022), *Mamapay* was endowed with part of its initial capital from a VC fund whose majority LP is Transsion, the Shenzhen-based phone manufacturer that dominates the African market (see [Able, 2022](#)). Building on the ancillary needs of the SOE employees and on the spillages of BRI projects, both *Easytransfer* and *Mamapay* are creating alternative infrastructural protocols to western-dominated standards for cross-border transaction, such as SWIFT MT, while linking the highly-regulated Chinese banking systems with on-the-ground financial practices of Global China, and further tapping into informal urban economies that increasingly rely on Chinese commodities.

Put differently, looking at the African infrastructure state encounters of different varieties of capital, between SOEs and small startups, and between transport and ICT corridors, we catch a glimpse of the speculative infrastructural practices that are reshaping Africa-China connectivity much beyond BRI roads and railways. What *Easytransfers* and *Mamapay* highlight, ultimately, is not just how “plural” the forms of Chinese digital capitalism can be ([Qiu et al, 2022](#)), but also how their value chains intersect the alliance between the African infrastructure state and the connectivity programmes of China's going out capitalism, while producing new, speculative linkages across the two.

5. Conclusion

The juxtaposition between transport and ICT infrastructure capital at the interface with the African infrastructure state is one of the possible vantage points —yet an increasingly important one— to study the

changing overseas presence of China. This vantage point, for example, reflects a paradigm shift that has been codified into Chinese policy as “New Infrastructure Construction”(NIC), to make a case that future capital investments must “strengthen new infrastructure construction, such as artificial intelligence, industrial Internet, and the Internet of Things” (Gu, Zhang, and Zhang 2021). In other words, the overlap between the activities of Chinese contractors of “traditional infrastructure” and “digital champions” is now, officially, a strategic matter. This has been accompanied by a general downslide of BRI lending for highways and railways, and an increasingly turbulent global technology market in which some Chinese companies retreat and others become more powerful than ever.

In these mutating circumstances, it is easy to make bold claims that are short lived. And so in this paper we sought the guidance of Global China as a conceptual and analytical helm to provide conjunctural insights into these dynamics. Specifically, we have brought into the framing of Global China scholarly work and empirical material that are rarely held side by side when looking at the presence of Chinese capital in Africa: from the political economy of market-in-state, which offers a poignant interpretation of the state-market nexus in China ([Zheng & Huang, 2018](#)), to studies of Chinese technology ([Hong, 2017](#); [Shen, 2021](#); [Tang, 2019](#)) that showcase the embeddedness as well as the unique place of Chinese technocapital in global flows of ideas and investments. Combining our research about transport infrastructure ([Goodfellow & Huang, 2021](#)) and about Chinese startups and tech investors in Africa ([Pollio, 2022](#)), we have embraced the conceptual and empirical multifacetedness of Global China.

We have therefore shown how different varieties of capital across two infrastructure sectors, with their parallels and their differences, overlap in strategic and contingent ways at the interface of the Chinese state-market nexus and the African infrastructure state. Using the case of Kenya, our empirical contribution advances the project of de-essentializing the Chinese presence in Africa, recognizing how projects of statecraft and national development in the continent shape these investments. Two insights are particularly important from this comparative perspective.

First, Global China in Africa is composed of a multiplicity of actors, which vary in the depth of state control as well as in the size, while operating in adjacency with each other and within the same market-in-state system that propels its firms' going out practices. Yet, the operations of transport infrastructure and ICT capital, while straddling the state-market nexus of Chinese going-out capitalism, do not land in a vacuum but meet extant developmental ambitions of the African infrastructure state. In our case, as we have seen, not only do large Chinese digital companies and construction firms operate within the same developmental framework set forth by the Kenyan state, smaller digital startups also seek corridors of opportunity in the value chains engendered by the domestic programmes of infrastructure-led development. Further unpacking the concept of the “infrastructure state” was beyond the scope of this paper, but we do believe that its analytical value rests in centering the interface between different structural and conjunctural thrusts, and between the different agencies that animate the geopolitical arena of infrastructure-led development.

There is much to miss in a neocolonial reading of these phenomena, one that does not acknowledge the degree to which Global China is also shaped by its encounter with long-standing ambitions of African developmental statecraft. Any compelling critique of Chinese capitalism in Africa needs to start from a recognition of the contingent interfaces which affect its strategies. In the case of our paper, we focused on how Kenya's developmental programmes engender the overlapping value chains of different varieties of Chinese capital, but there are other analytical entry points that likewise deserve further attention, from the geopolitics of standards to cultural, organizational and management practices ([Fei, 2020](#); [Fei, 2023](#); [Fei et al, 2018](#), [Hayk & Sailer, 2020](#)).

As the United States wage a “tech arms race” against China ([Chen et al, 2023](#)), and China sinks into growingly hardened forms of techno-

nationalism (Zhang, 2023), it becomes even more crucial to chart how the repercussions of these geopolitical shifts translate in context and shape, while being shaped by, the ambitions of the African infrastructure state. Then again, many possible vantage points are possible and, indeed, necessary. Academic knowledge may well be a very weak antidote to sensationalist and politically motivated stories of China in Africa (and elsewhere), but there remains value in producing collaborative research that challenges linear, frontierist readings of infrastructure-led development and capitalism in the continent (Ouma, 2017), whether coming from China or from anywhere else. In a final move, therefore, we would like to gesture to the importance of acknowledging that comparative collaborations within the research agenda of Global China in Africa, as the one between the authors of this paper, entail personal encounters that are necessarily asymmetrical, partial, entrenched in long-standing politics of knowledge production, but also generative, exciting, and pressing.

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CRediT authorship contribution statement

Zhengli Huang: Conceptualization. **Andrea Pollio:** Conceptualization.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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