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Index

Evolving and differentiated strategy? A network approach to understanding Chinese development finance in Africa

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Since the early 2000s, China has significantly expanded its global economic footprint through the "Going Global" strategy and, more decisively, through the BRI (Belt and Road Initiative). The creation of major financing institutions, such as the China Development Bank (CDB), the Export-Import Bank of China (CHEXIM), the Asian Infrastructure Investment Bank (AIIB), and the New Development Bank (NDB), along with the establishment of the China International Development Cooperation Agency (CIDCA) in 2018, consolidated China's overseas development finance architecture. On the other side, Africa has emerged as a central arena for this engagement, with China becoming the continent's largest trading partner and a leading source of infrastructure financing.

The literature on Chinese development finance has largely focused on its implications for global governance (Mawdsley et al., 2017; World Bank Group, 2021), its challenge to the OECD-DAC aid regime (Brautigam, 2011; Hoeffler and Sterck, 2022), and its potential motivations, including access to natural resources and geopolitical influence. Some scholars argue that Chinese aid disproportionately targets resource-rich countries to secure commodity supplies (Guillon and Mathonnat, 2020; Broich, 2017). Others contest this view, finding little empirical support for systematic resource bias (Dollar, 2016; Dreher and Fuchs, 2016). Similarly, evidence regarding the role of governance quality and political stability is mixed: some studies suggest that China is mainly indifferent to governance standards (Guillon and Mathonnat, 2020), while others indicate that political stability or government effectiveness may matter (Mourao, 2018).

Against this backdrop, we explore whether Chinese development finance shows differentiated patterns over time and across partners' characteristics, specifically natural resource endowment and political stability, adopting Social Network Analysis to identify clusters of African countries that share similar funding sources from Chinese institutions. This approach shifts attention from aggregate allocation patterns to relational structures, allowing the identification of similarities in how countries are positioned within China's financing network. The study uses the AidData Global Chinese Development Finance Dataset, filtered to consider only the African countries who benefited of Chinese funding and joined the BRI. Moreover, we take into account all projects where the recipient

expressed a formal commitment to the project. The dataset used includes 20,985 projects financed between 2000 and 2021 in 165 low- and middle-income countries, amounting to approximately USD 1.34 trillion (in constant 2021 dollars). Aid flows are categorized into two main types: ODA-like flows (grants, interest-free loans, debt relief, technical assistance, and in-kind contributions) and Other Official Flows (OOF-like flows), which include semi-concessional and non-concessional loans and export credits.

The methodological core of the study involves constructing two-mode networks linking Chinese financing institutions and recipient countries, then converting these into one-mode networks consisting solely of countries. In the one-mode networks, ties between countries represent high similarity in funding sources, measured through a similarity score ranging from zero to one. A threshold of 0.97 is imposed to identify pairs of countries that are nearly identical in terms of the Chinese institutions financing their projects. Separate networks are generated for the pre-BRI period (2000–2013) and the post-BRI period (2014–2021), and for ODA-like and OOF-like flows, yielding four distinct networks.

Two key attributes are incorporated into the network analysis: natural resource endowment and political stability. Resource richness is determined using the International Monetary Fund's classification of resource-rich developing countries. Political stability is measured using the Global Peace Index (GPI), which assesses exposure to conflict, violence, and insecurity. Countries are grouped into quartiles based on average GPI scores for the periods 2008–2013 and 2014–2021, with lower scores indicating greater stability.

Table 1 describes the dataset we used for investigating the pre- and post-BRI ODA-like and OOF-like aid flows, while Table 2 shows the network statistics (number of ties: the number of existing relationships in the network; average degree centrality: the average number of relationships owned by each node/country; density: the ratio between the number of existing relationships and all the possible relationships in the network; centralisation: a measure of how tightly the network is structured around specific central nodes).

Table 1. Descriptive statistics: AidData's Global Chinese Development Finance Dataset (constant 2021 USD millions)

Type of flow	Number of projects	Average value	Min	Max	Standard deviation
ODA-like 2000-2013	1489	44.7	0.0000935	3.251,00	196
ODA-like 2014-2021	1769	79.1	0.0000014	23.046,00	851
OOF-like 2000-2013	541	373	0.01567	32.032,00	1652
OOF-like 2014-2021	765	373	0.00308	13.355,00	1043

Table 2. Network statistics

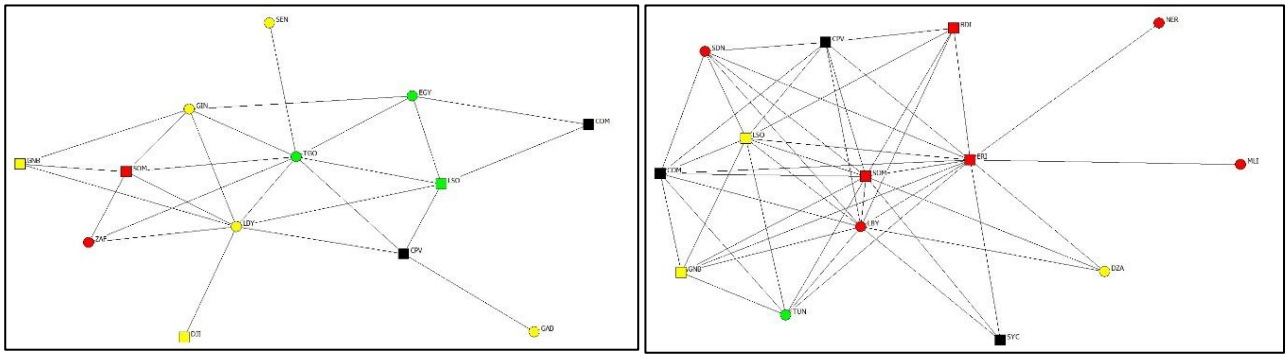
Type of flow	Nodes	Number of ties	Average degree centrality	Density	Centralisation
ODA-like 2000-2013	49	50	1.020	0.021	0.152
ODA-like 2014-2021	50	90	1.800	0.037	0.238
OOF-like 2000-2013	46	4	0.087	0.002	0.021
OOF-like 2014-2021	48	76	1.583	0.034	0.165

Comparing the pre- and post-BRI periods reveals significant changes in the network structure, confirming the BRI as a turning point in China's development finance strategy. In the pre-BRI ODA-like network (2000–2013) (Figure 1 a), clusters of similar countries often correspond to shared levels of political stability. For example, countries with medium-high GPI scores tend to cluster together, as do those with low or medium-low stability. Resource endowment appears less systematically associated with similarity patterns. Some non-resource-rich countries form clusters, but these are not consistently replicated across the network.

In the post-BRI ODA-like network (2014–2021) (Figure 1 b), new patterns emerge. Notably, a cohesive group of countries with low GPI scores — including politically unstable states — appears more prominently connected. This suggests a possible shift toward greater engagement with less stable environments under the BRI framework. At the same time, the network becomes denser, indicating an expansion and intensification of China's ODA-like financing relationships.

Figure 1. ODA-like aid network

a) 2000-2013 b) 2014-2021

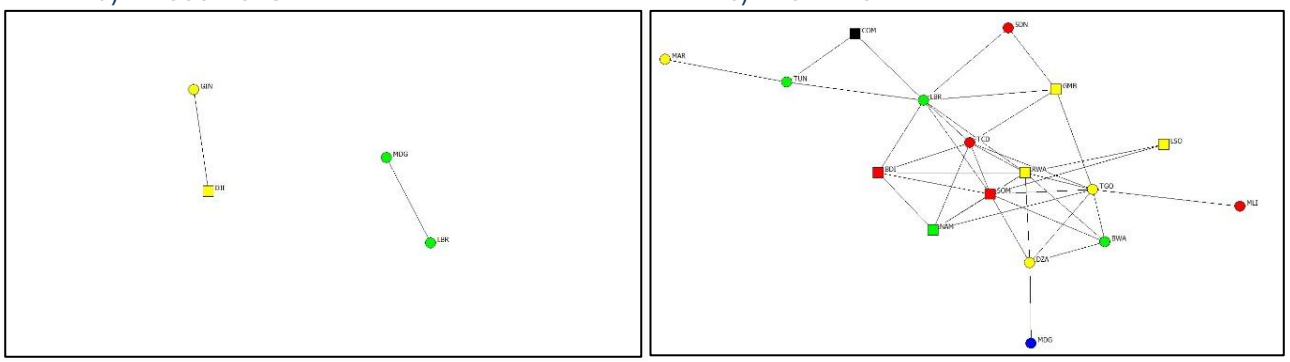


Legend Node's shape: a) circle: resource-rich country; b) square: non-resource-rich country. Node's colour: 1) green: medium-high GPI; 2) yellow: medium-low GPI; 3) red: low GPI; 4) black: no score available. For country codes see here.

The OOF-like networks display somewhat different dynamics (Figure 2). In the pre-BRI period, very few country pairs exhibit high similarity, but those that do tend to share similar GPI scores, reinforcing the apparent relevance of political stability in shaping allocation patterns (Figure 2 a). In the post-BRI OOF-like network (Figure 2 b), however, the pattern becomes less clearly associated with either political stability or resource endowment. The network displays a core-periphery structure, with a cohesive core composed mainly of non-resource-rich countries from regions such as the Horn of Africa and Southern Africa. This suggests that post-BRI OOF-like financing may reflect broader geopolitical or regional integration objectives rather than targeted selection based on specific country attributes.

Figure 2. OOF-like aid network

a) 2000-2013 b) 2014-2021



Legend Node's shape: a) circle: resource-rich country; b) square: nonresource-rich country. Node's colour: 1) blue: high GPI; 2) green: medium-high GPI; 3) yellow: medium-low GPI; 4) red: low GPI; 5) black: no score available. For country codes see here

The launch of the BRI marks a clear watershed. Network structures become more complex and expansive, reflecting the initiative's ambition to deepen connectivity and regional integration. However, the effects differ by flow type. In ODA-like networks, political stability continues to matter, albeit in evolving ways. In OOF-like networks, especially after 2014, attribute-based differentiation becomes less pronounced, possibly indicating a shift toward broader geopolitical considerations or a reduced emphasis on selectivity as China consolidated its presence in Africa.

Concluding remarks and policy implications

Overall, our findings challenge the narrative that Chinese development finance in Africa is primarily driven by the objective of securing natural resources. Across both ODA-like and OOF-like flows, resource endowment does not consistently emerge as a decisive factor shaping similarity patterns. Instead, political stability appears to play a more significant role, particularly in the pre-BRI period and in ODA-like flows. This suggests a pragmatic approach in which China values stable environments conducive to long-term economic and political relations.

The observed patterns can be read as evidence of a flexible and adaptive Chinese strategy rather than a rigid, resource-driven agenda. While geopolitical motivations are acknowledged, particularly the

importance of the BRI in reshaping China's global projection, the study emphasizes that long-term partnership building and infrastructural connectivity seems to be more central than short-term resource extraction goals. The decline in China's resource-intensive growth model and the global commodity boom's slowdown after 2014 may also have reduced the urgency of securing resource supplies through targeted financing.

Several policy implications emerge from this analysis (see also Caria and Ghinoi 2025). If ODA-like and OOF-like flows represent distinct strategic instruments, African policymakers should recognize these differences and tailor negotiation strategies accordingly. Understanding patterns of similarity and differentiation can enable governments to anticipate China's strategic priorities and design agreements aligned with national development objectives. Moreover, countries sharing similar financing profiles might benefit from mutual learning and cooperation in managing Chinese-funded projects.

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Understanding and addressing digital inequalities

Roberta Carlini

It seems widely accepted that we have entered an era of great disappointment due to broken promises in the digital age. The famous photo opportunity of the world's richest men, the owners of leading technology companies, courting the inauguration of the Trump presidency, practically shows the end of the utopian idea that the internet revolution would democratise power. Superstar effects and a tendency towards monopolies in the economic sphere; illiberal turn and a tendency towards oligarchy in the political sphere. Are these developments merely a parenthesis in history due to the choices of a few individuals, or are they a consequence of structural forces shaping the economy, society and the public sphere in the digital era? Has the democratising potential of digital technology disappeared? How can accelerating innovation in artificial intelligence technology be used to promote social progress? How can the tools of regulation, competition law, and public policies be updated for the digital world?

Without claiming to provide comprehensive answers to these significant questions, the Centre for a Digital Society (CDS) and the Centre for Media Pluralism and Media Freedom (CMPF) of the European University Institute recently hosted a scientific conference focusing on 'Understanding and Addressing Digital Inequalities'. The CDS is an interdisciplinary academic hub that brings together scholars specialising in regulation, competition and innovation, and the impact of digitalization on society. The conference on digital inequalities originated from the collaboration between the two research groups, whose work has become increasingly intertwined due to the comparable impact of digitalisation on the phenomena observed. Rather than being chosen as a theme, 'digital inequalities' were chosen as a tool to analyse, understand and hopefully address the impact of digital transformation on democracy *through the lens of inequality*.

The aim of the conference was to connect the dots between the growing scientific (and political) debate on 'traditional' inequalities and the literature on the digital divide with emerging research on socio-digital inequalities, and the discussion was organised around three main themes:

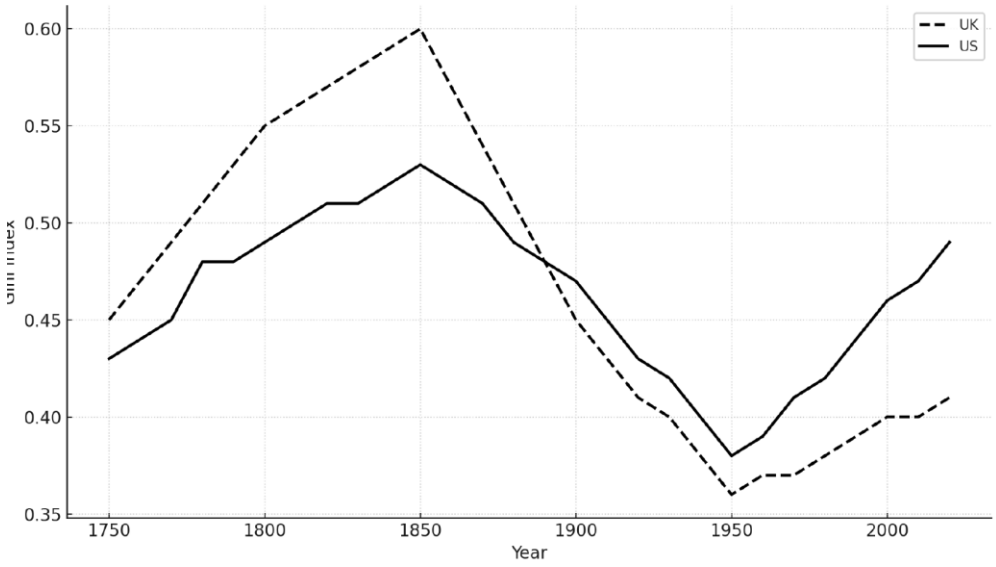
- The economic dimension of digital inequalities (with a focus on research at the firm level, the analysis of consumption and income dynamics, the market power dynamics and the role of competition policy).
- The emerging inequalities in the digital information environment (media poverty, vulnerability to information disorder, the issue of fair remuneration for the creators, and the infrastructural divide).

- The impact on (and remedies in) the constitutional and public spheres (policy dilemmas, data policy, and regulatory approaches to address algorithmic inequalities and new vulnerabilities).

While it would be difficult to summarise the findings from each session, it is worth noting that one of the most appreciated features of the conference was 'interdisciplinarity'. Useful materials can be found in the presentations, and many of the contributions will be published in a collective working paper from the conference.

These materials can be viewed in the context of the historical trend of inequalities, as analysed in Professor Pier Luigi Parcu's presentation and visualised in the following figures.

Figure 1. Gini index in the UK and US, 1750-2020



Source: Parcu (2025)

Figure 1 above shows the trend of the historical data for the Gini index in the United Kingdom and the United States, comparing the first industrial revolution (around 1750-1850) and the contemporary digital revolution (around 1980-2020). Britain's Gini index rose from roughly 0.45 in 1750 to around 0.60 by 1850—a 33% increase—while the United States displayed a similar but somewhat milder pattern.

Another "inequality picture" emerges from the trend of a composite indicator, constructed by merging historical data from the UK and the US (and weighting national values by their relative share of world GDP, to take into account the gradual shift of economic centre of gravity from UK to US) (Figure 2 below).

According to the Composite Gini Index, inequality rose by approximately 0.23% per year between 1750 and 1850, compared to 0.38% per year between 1980 and 2020. The digital revolution, which began in the 1980s, has led to an increase in inequality that is more than 40% steeper than that seen during the first industrial revolution.

Figure 2. Composite Gini Index (UK-US Maddison-weighted)

Source: Parcu (2025)

In analysing these patterns and the structural differences in value extraction between early industrialisation and the digital economy, Parcu (2025) highlights the close interconnections between economic and cultural inequalities caused by one of the digital economy's main features: *informational asymmetries*. The need to consider a broader divide that goes beyond the relevant, albeit limited, inequalities in income and wealth is also affirmed by other authors.

The interplay between 'traditional' inequalities and digital inequalities lies at the heart of Hellen Helsper's research. Helsper's foundational work employed the theoretical framework of the relevant field to build a model of the links between social and digital exclusion (see also the conference presentation). It suggests that the term 'socio-digital inequalities' should be preferred, as digital opportunities and risks are unevenly distributed. The outcomes of digitisation are closely linked to long-standing systemic inequalities: economic, social, gender, ethnic, and class-based inequities. These inequalities are path-dependent and often reinforce existing disparities. For example, those with economic capital often translate digital access into more wealth, while those with strong social networks might use technology to strengthen social capital. Context is also crucial. For example, in societies with strong gender inequality offline, digital gender inequality tends to be wider. Where there's more parity offline, digital inequality is smaller". This has a direct impact on the civic and political participation, with mechanisms that make the public sphere become less representative.

Many of the research findings discussed at the conference attempt to delve into and explain the apparent paradox of why the internet, a technology with democratising potential, has not opened up opportunities equally, but has instead accompanied an increase in inequality. What 'went wrong' (to quote the title of a book by the Italian journalist Riccardo Luna about the internet and its discontents)? And what can be done to reverse the trend? What is the most appropriate territorial scope for governing a borderless phenomenon?

Some suggestions and lessons can be drawn for policy and academia. If the problem is not just 'digital', then neither should the solution be solely digital. Instead, it should be based on a holistic and interdisciplinary approach at a scientific level, and at an institutional and political level it should be based on a set of policies that update frameworks designed in the analogue era and introduce new tools to tackle unacceptable inequalities without hampering technological innovation.

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