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Research Report

International Development Lending and Global Value Chains in Africa

Policy Brief, No. 57/2021

Provided in Cooperation with:

China Africa Research Initiative (CARI), School of Advanced International Studies (SAIS), Johns Hopkins University

Suggested Citation: Amendolagine, Vito (2021) : International Development Lending and Global Value Chains in Africa, Policy Brief, No. 57/2021, China Africa Research Initiative (CARI), School of Advanced International Studies (SAIS), Johns Hopkins University, Washington, DC, <http://www.sais-cari.org/publications-policy-briefs>

This Version is available at:

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POLICY POINTS

International lending,

can help African countries increase their participation in GVCs and specialize in higher value-added stages of international production.

Attracting foreign loans

should be viewed as a middle-to-long run strategy for boosting economic development, since the positive effects of lending acquire strength by time.

Loans to transport and

communication sectors

are important to increase borrowing countries' participation in GVCs.

International Development Lending and Global Value Chains in Africa

Vito Amendolagine

PARTICIPATING IN THE PROCESS OF GLOBAL PRODUCTION fragmentation by connecting to global value chains (GVCs) provides a “golden” opportunity for developing countries to access international markets and boost economies. International institutions such as the World Bank, International Monetary Fund, and the United Nations Industrial Development Organization have expended great effort to promote proper policies that can help low-income countries take advantage of such opportunities. This work explores the extent to which international development lending can support African countries in trading intermediate goods with foreign partners, with the goal of further specializing in high value-added activities within cross-national production networks. The empirical analysis relies on a dataset that includes both Chinese and World Bank loans to a set of 35 African countries from 2000 to 2018. Based on this research, it appears that Chinese lending increases the involvement of borrowing countries in the international trade of intermediate goods, while World Bank loans contribute to move African countries toward higher valued added activities along GVCs. This first result is explained by the different sectoral composition of Chinese and World Bank loans, with the former focusing more extensively on infrastructure, particularly transport and communications, and the latter on social sectors, such as education and health. The second research question investigates the specific role Chinese lending plays in infrastructure sectors. My research provides evidence that loans to transport and communication sectors significantly improve African countries' participation in GVCs by reducing trade costs and enhancing connection to foreign partners. Such results become more evident over time, especially with concessional loans.

THE RESEARCH

THE EMPIRICAL ANALYSIS IS CARRIED OUT ON A DATASET at the country-year level covering a large part of African countries observed for almost two decades (from 2000 to 2018). Data on Chinese development lending (CDL) came from the Interactive Database of Chinese Loan Commitments to African governments by the China-Africa Research Initiative (CARI). CARI reports information for each loan, including loan year, sector, value, and type of lender, which are used in the analytical framework. Similar

information from the World Bank Projects & Operations database is also taken for World Bank development lending (WBDL).

I build GVC indicators by data from the UNCTAD-Eora Global Value Chain database. African countries where value-added trade data is of insufficient quality according to the provider are excluded. Therefore, the analysis focuses on 35 African countries that have received Chinese lending and for which the UNCTAD Eora database offers reliable GVC indicator data.¹

Figure 1 and 2 show, respectively, the allocation of Chinese and World Bank development loans to the countries and sectors included in the dataset. Both China and the World Bank give larger amounts to Egypt, Nigeria, Kenya, and South Africa. For China, other important African borrowers include Angola, Zambia, and Cameroon, while Tanzania and Morocco are relevant destinations for World Bank loans. More than half of Chinese loans are directed to infrastructure sectors, particularly to transportation (36 percent). The remaining Chinese lending is broken down as follows by sector: production (21 percent), social - including government, education, environment, food, and health (10 percent), and financial (2.6 percent).

In the case of World Bank loans, social sectors take very large share of lending (41 percent). In turn, infrastructure loans make up a smaller share compared to Chinese lending (44 percent), such as the production sector (11 percent).

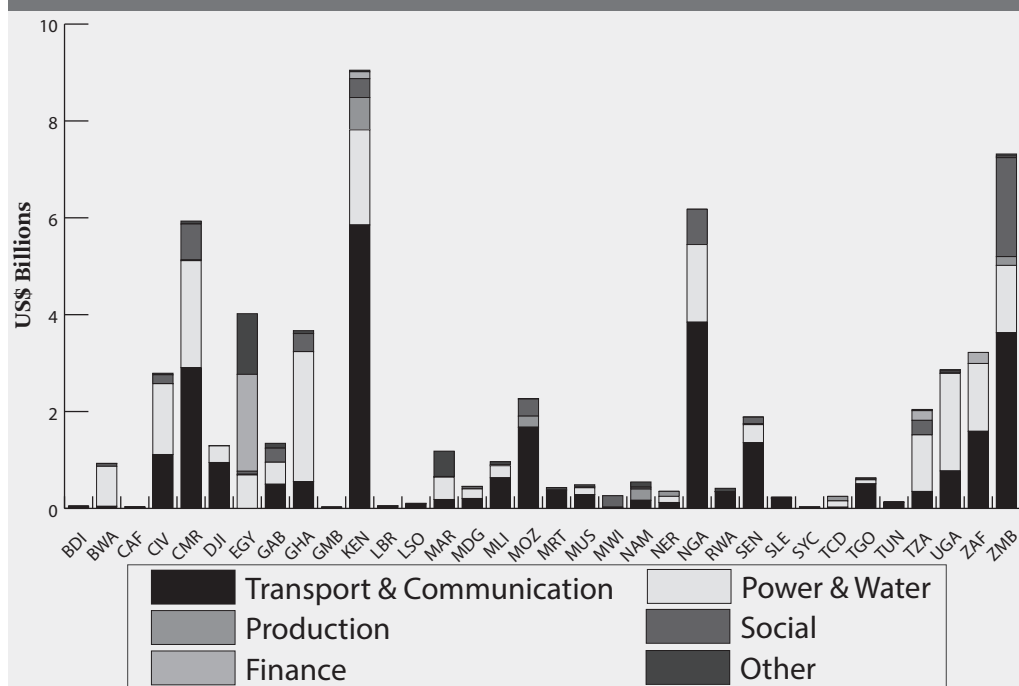
Instead, the financial sector is a more important destination (4 percent).

I employ OLS regression to estimate the "average dynamic" impact of CDLs and WBDLs on the GVC involvement of the 35 African countries included in the sample. I consider two different output variables: (i) the annual growth rate of GVC participation; (ii) the annual growth rate of GVC position. GVC indicators are constructed following Koopman *et al.*, which breaks down gross exports to allow the identification of exports that involve intermediate goods and cross at least two national borders.² The GVC participation index measures the share of intermediate goods (exports plus imports) within gross exports. GVC position index measures the logarithmic difference between intermediate goods exports and intermediate goods imports: exports measure upstream type GVC participation since they are related to the first stages of value chains which are far from the final demand; imports are a measure of downstream GVC participation, since they are related to the final GVC stages which are closer to the final demand.

The empirical analysis also controls for some of the most important factors of GVC participation and GVC position: (i) the log value of inward FDI stock; (ii) the institutional quality, proxied by the rule of law index; (iii) the share of mineral rents in GDP, proxying the relevance of natural resources; (iv) human capital index, based on years and returns to

education; (v) the presence of bilateral international agreements between China and the borrowing country, captured by a dummy variable. Data sources for these variables are the World Bank, Penn World Table, and UNCTAD.

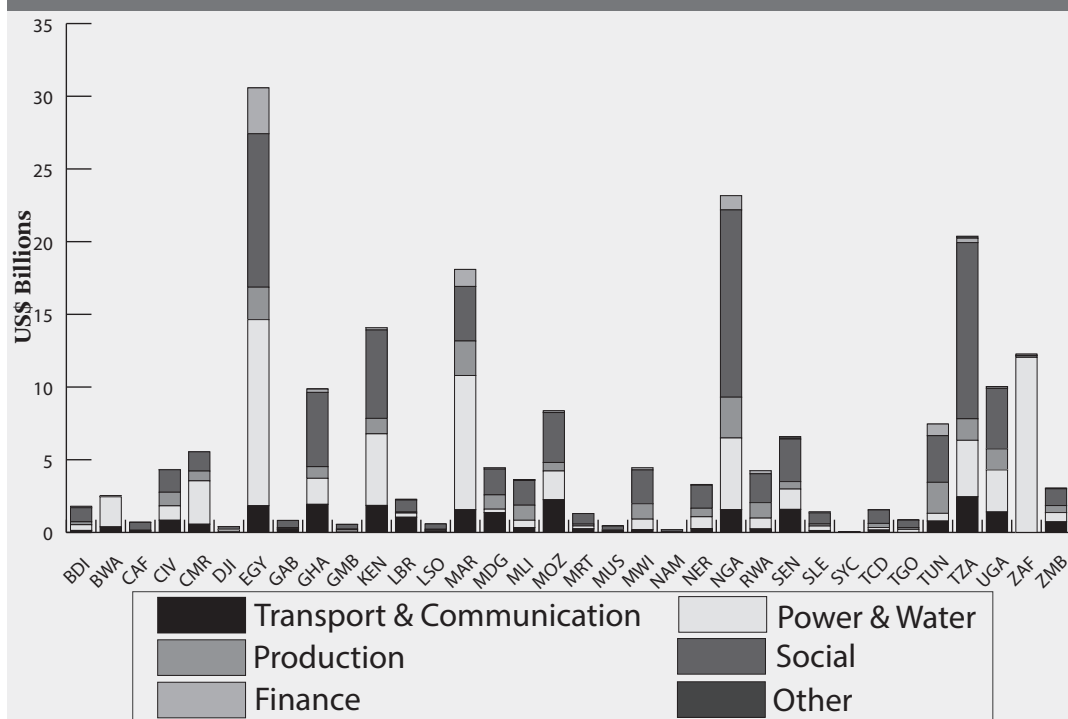
Figure 1: Chinese Loans in Africa by Country and Sector*



Source: Author's calculation based on SAIS-CARI database. *Data excludes Angola.

MAIN RESULTS

I FIRST INVESTIGATE the effects of CDL and WBDL on the growth rate of African economies' participation in GVCs. Only aggregate values of Chinese loans significantly increase a borrowing economies' involvement in the international trade of intermediate goods. CDLs' effect becomes statistically

Figure 2: World Bank Loans in Africa by Country and Sector*

Source: Author's calculation based on World Bank database. *Data excludes Angola.

significant from the second year after the loan onward and the magnitude increases by time: on average, a one percent increase in CDLs is related to 0.55 percent increase in GVC participation in the fourth year after the loan. Thus, Chinese development finance institutions “big push” industrialization approach does turn out to be effective for enhancing African markets’ chances to access GVCs.

Turning to the contribution that CDLs and WBDLs make on African economies’ ability to upgrade along GVCs, only WBDLs’ aggregate value significantly drive African economies toward more upward positions by exporting more value added than they import. Also in this case, the effect becomes statistically significant from the second year after the loan and increases by time in magnitude, which is however quite low. Meanwhile, CDLs do not have any significant effect GVC position upgrades.

One of the reasons CDLs and WBDLs have different impacts on GVC dimensions (i.e., participation and position) is the different sectoral composition each lender has. As shown in Figure 1 a large part of CDLs are directed to infrastructure sectors (about 60 percent) and all the countries in the sample have received at least one loan to those sectors between 2000 and 2018. Instead, WBDLs are more focused on social sectors (Figure 2) that are closely

related to education and innovation, which are key factors to climb to higher GVC stages.

The second part of the empirical analysis focuses on the specific impact Chinese loans to infrastructure sectors have on African involvement in GVCs. Results confirm that Chinese loans to infrastructure sectors are likely to be the driving factor behind the positive and significant result that overall CDLs have on borrowing countries’ GVC participation, although ineffective on the relative position of those countries

along GVCs. Therefore, this empirical finding supports what international institutions such as the IMF, OECD, and World Trade Organization claim about the importance of filling the infrastructure gaps to enhance developing countries chances to access GVCs.

I find that only loans to the transport and communication sectors significantly affect borrowing countries’ GVC participation, while loans to power and water sectors do not yield any significant result. This test confirms the crucial importance of reducing transport and communication costs to compete in trade of intermediate goods.³ Some examples of such loans in our dataset are the US\$ 3.6 billion loan to Kenya, supporting the building of the railway line connecting the capital Nairobi with Mombasa, which is home to the largest port in East Africa; the US\$ 1.3 billion loan to Nigeria, financing the railway connection between the capital Lagos and Ibadan, Nigeria’s third largest city; the US\$ 932 million loan to Angola, financing the world-class Porto de Caio at Cabinda.

Finally, I test whether concessional loans, which MOFCOM and Eximbank give at a below-market rate, can provide additional benefits in terms of GVC participation. Within this scope, I focus on the loans that are more likely to boost the output variable, which are those

directed to transport and communication sectors, and distinguish between concessional and non-concessional loans. Although effects are statistically significant for both concessional and non-concessional loans, I find that the magnitude of coefficients is larger in case of concessional loans: on average, a 1 percent increase in the volume of loans generates an increase of the borrowing country's GVC participation by 0.52 percent (concessional) and 0.38 percent (non-concessional) in the fourth year after the loan.

POLICY RECOMMENDATIONS

1. International lending can help African countries increase their participation in GVCs and, furthermore, specialize in higher value-added stages of international production. Therefore, attracting lending from foreign countries can be an additional channel through which developing countries can catch GVC's "golden opportunity".
2. Attracting foreign loans should be viewed as a middle-to-long run strategy for boosting economic development, since the positive effects of lending acquire strength by time.
3. Loans to transport and communication sectors have a crucial importance for increasing borrowing countries' participation in GVCs since they can reduce the cost and time of trading intermediate inputs within global production networks. ★

ENDNOTES

1. From the list of countries receiving CDLs I have excluded the following: Algeria, Benin, Burkina Faso, Cape Verde, Comoros, Democratic Republic of Congo, Equatorial Guinea, Eritrea, Ethiopia, Guinea, Guinea-Bissau, Republic of Congo, South Sudan, Sudan, Zimbabwe. Moreover, Algeria and Cape Verde are dropped since there are no loans to infrastructure sectors, which are focal for the empirical analysis.
2. Robert Koopman, William Powers, Zhi Wang and Shang-jin Wei, "Give Credit Where Credit is Due: Tracing Value Added in Global Production Chains," National Bureau of Economic Research, working paper no. 16426 (December: 2011).
3. Hummels, D. L., & Schaur, G. (2013). Time as a trade barrier. *American Economic Review*, 103(7), 2935-59.

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Support for this working paper was provided by a grant from Carnegie Corporation of New York. Carnegie Corporation of New York is a philanthropic foundation created by Andrew Carnegie in 1911 to do "real and permanent good in this world."

