Debt Restructuring in Africa

BUILDING PUBLIC ASSETS AND ADDRESSING BOTTLENECKS FOR LOW-CARBON ECONOMIC TRANSFORMATION

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ABSTRACT

The current narrative on debt sustainability often ignores the issue of what a government owns (assets) versus what a government owes (liabilities). While conventional approaches largely focus on the liability side, the kinds of assets that a country is trying to build are vital to development and debt sustainability. This paper voices the concerns from the Global South that the debt sustainability analysis (DSA) framework has ignored public assets. After a brief review of debt issues in Africa, this paper points to the importance of the public sector balance sheet in understanding debt sustainability. Further, we investigate the role of 3,126 completed infrastructure projects, co-financed and jointly built by China and the host countries, focusing on whether and to what extent they have addressed infrastructure bottlenecks. These completed projects form part of a country's public operational assets that generate essential social services, jobs, government revenues, exports and growth. If a host government wishes, these assets could later be put up for initial public offerings

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(IPOs), or add value to Public Wealth Funds (PWF) or Sovereign Wealth Funds (SWF)/ pension funds, yielding widespread economic benefits in the host country. We then explore which other possible forms of development finance, such as equity investment, might be better utilized in the post-pandemic era, including several proposals on how to restructure debt using an "asset plus" approach, to finance "net-zero assets" for lower carbon economic transformation.

Keywords: debt sustainability analysis, public sector balance sheet, addressing infrastructure bottlenecks, green transformation, debt and equity finance

INTRODUCTION

Assets and liabilities are recognized as the two sides of any corporation's or private individual's balance sheet. However, it is less well understood that governments, too, have not only liabilities but also, perhaps most importantly, assets. In a country's public sector balance sheet, its public sector assets would be worth at least twice the country's GDP and often much more than its debt, if properly measured using accrual accounting (IMF 2018). Yet, current discussions on debt sustainability in general and debt restructuring often leave out public assets — an important side of the public sector balance sheet.

In an environment characterized by low interest rates and high uncertainty, the best way to overcome a debt overhang is not to stop investment but to continue to invest in public assets. Public assets are able not only to generate a positive yield, but also to support a green transformation, generate jobs and build revenues as well as economic growth.

Post-pandemic, the critical issues will be about how to "build back better". This means having the capacity to manage what has already been built and to improve the capacity to continue investing in productivity growth. Simulations show increasing investment could potentially generate sizeable debt, particularly for the most indebted economies. However, if properly targeted, new investment would also increase the value of the assets and thereby improve net worth (assets less liabilities), a more relevant fiscal measure than just debt over GDP and cash (Yousefi 2019). Focusing on net worth as the most comprehensive fiscal measure would help to incentivize investments that stimulate economic growth.

The world is experiencing an uneven post-pandemic recovery. The global economy is experiencing a "two-track" recovery, with global GDP expanding 5.9 percent in 2021, its strongest post-recession pace in 80 years. However, the recovery has been dominated by major economies such as China (8.1 percent) and the US (5.6 percent) (World Bank 2022). Massive fiscal and monetary stimulus packages were implemented, but the economic recovery has been highly unbalanced. We are facing an inconvenient truth that millions of people in the Global South are still trapped in poverty as a result of the pandemic.

African countries were projected to recover in 2021 from their worst economic recession in half a century, and to grow by 4.0 percent (World Bank, 2022). The continent has the lowest vaccination rate for COVID-19; at the same time, its mounting debt level is another critical risk. In the last decade before the pandemic, we have seen in African countries the largest, fastest and most

broad-based debt accumulation. The pandemic has worsened the situation by unprecedented large capital outflows leading to liquidity crises, currency depreciations and worsening debt distress in some countries.

This paper voices the concerns from the Global South on the debt sustainability analysis (DSA) framework, which has only focused on liabilities without looking at the asset side of the public-sector balance sheet. In our view, net worth (assets minus liabilities) is the most comprehensive measure of fiscal position. Continued accumulation of public assets, if accounted for properly, not only leaves African governments with a better debt profile than conventional approaches would exhibit, but also contributes to long term economic growth. In the broader context of development finance, the patterns of aid, including grants, concessional finances, debt (commercial loans and bonds) and equity, are intertwined and can be used in blended finance. We stress that structural transformation matters in productivity growth, and any structural transformation must be green — that is, new investments must not only have positive economic impact but also must support climate transition. Green investment and debt restructuring must be incentivized by a combination of old debt and new green projects, which we call "asset plus approaches". These approaches include several options which we discuss in this paper.

African debt looks rather grave when using only the DSA lens, but appears less so when seen through a public assets lens; we note though that good data are far from adequate. Debt restructuring through International Monetary Fund (IMF) programs will necessitate a major contraction in public debt and investment that may have an anti-investment bias and make things worse rather than better in a recession. As we show later in this paper in our examination of 3,126 completed infrastructure projects, China has made major investments in Africa that have addressed bottlenecks and built public assets. Based on that outcome, new investment from China and other development partners — in the form of debt but also equity—can continue to build up public assets with an attendant improvement in growth and social welfare.

Section 1 of this paper contains a descriptive analysis of the indebtedness of African countries. Section 2 presents our rationales for the view that public assets are key to debt sustainability. Section 3 reviews China's own experience in utilizing equity (foreign direct investment, or FDI, and domestic savings) versus debt financing during its own economic transformation. Section 4 presents our main empirical analysis regarding how China has helped Africa's structural transformation by addressing countries' bottlenecks in hard and soft infrastructure areas, such as water, electricity, transportation, telecom and internet, health, education, the environment and government effectiveness. Section 5 provides our proposals including "asset+ based refinancing (ABF)" (Gallager and Wang 2020), designing and investing in "net-zero assets", debt to green bond swaps (ABS) and debt-for-nature swaps. All these efforts aim to achieve the 2030 Sustainable Development Goals (SDGs) in the post-pandemic era.

A DESCRIPTIVE ANALYSIS OF DEBT IN AFRICAN COUNTRIES

The global consensus on public debt has been based on the debt sustainability analysis (DSA) framework as initially proposed by the IMF and the World Bank in 2002, and later revised in 2017. The framework is intended to balance these countries' financing needs with their ability to repay — both in the present and in the future. This indicator-based framework associates a country's risk of debt distress with the quality of its policies and institutions as measured by the World Bank's Country Policy and Institutional Assessment (CPIA) scores, with the understanding that better-performing countries would be able to bear a higher debt burden.

Table 1.1 Debt Sustainability Framework (DSF), Country Policy and Institutional Assessment (CPIA)

Debt Sustainability Indicators (percent)	Strong (CPIA ≥ 3.75)		Medium (3.25 < CPIA < 3.75)		Weak (CPIA ≤ 3.25)	
	Original	2017 Rev.	Original	2017 Rev.	Original	2017 Rev.
PV of debt/GDP	50	55	40	40	30	30
PV of debt/exports	200	240	150	180	100	140
Debt service/exports	25	21	20	15	15	10
Debt service/budget revenue	22	23	20	18	18	14

Source: IMF (2017).
Note: PV = present value.

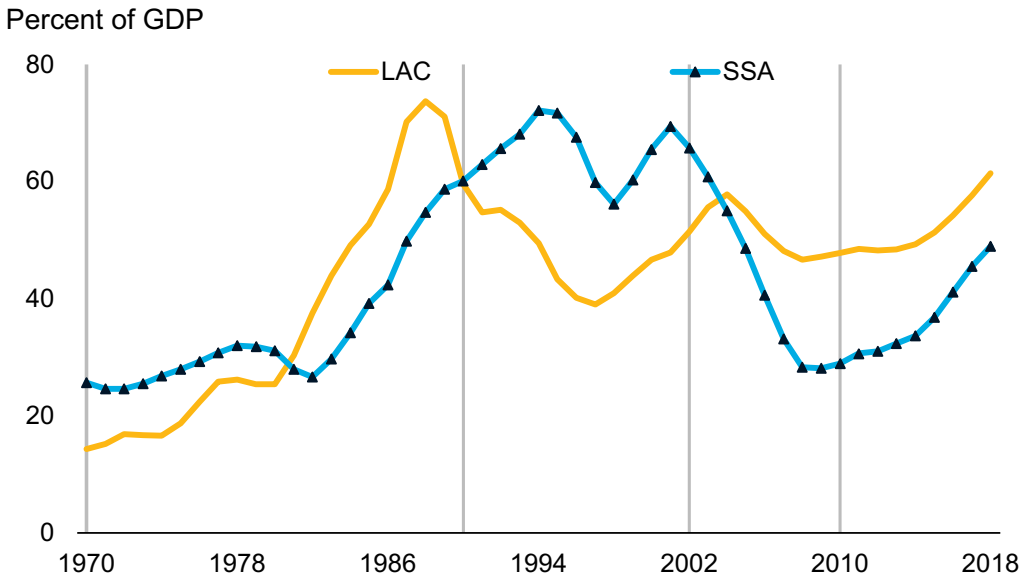
The governments and economists of developing countries have voiced many complaints about the DSA and its mechanism (see Goldstein 2003; Hostland and Karam 2005; Akyüz 2006; Gray et al. 2008). First, the calculation of "debt" does not distinguish those for investment from those for consumption (salaries and pensions); it thus has an anti-investment bias (Lin and Wang 2017 66-67). Further, it neglects the public assets formed after completing an investment project. Second, if the eligible low-income countries violate these benchmarks, they will be defined as being in "debt distress" and will lose further access to global capital markets. Third, to date, DSAs do not include climate or other sustainability risks, nor do they account for crucial investment needs for climate adaptation or achieving the 2030 Agenda for Sustainable Development. They need to be based on realistic assumptions and account for climate risks and spending needs to scale up investment in climate resilience, the transition to a green economy, and the 2030 Agenda set forth by the United Nations. Eligibility for debt relief should be determined in a substantially enhanced DSA carried out by the IMF and the World Bank in close partnership with debtor governments, with inputs from other institutions (Volz et al. 2020).

Under pressure from the Global South, the IMF Executive Board has approved a new framework for debt sustainability for market access countries (MACs), which is due to become operational in early 2022. The new framework will include broader and more consistent debt coverage, a longer projection horizon, new tools at multiple horizons based on superior analytical methods that account for countries' structural characteristics and enhanced transparency in the bottom-line assessments, including the exercise of judgment. Furthermore, the new tools support probabilistic debt sustainability assessments, as required by the Fund's lending framework (IMF 2021). However, nothing was mentioned about how to incorporate the other side of the balance sheet: that is, public assets and net worth.

Time Trend: Four Waves of Global Debt

A World Bank study shows that there have been four waves of global debt accumulation. The first wave (1970-1989) refers to debt accummulated mainly by governments in Latin America and low income countries, and Sub-Saharan Africa (SSA); the second (1990-2001) was concentrated in East Asia and the Pacific (EAP); the third (2002-2009) occurred chiefly among the private sector. The fourth wave (2010 onwards), by contrast, has occurred in all of the emerging market and developing economies (EMDE) regions (Kose et al., 2020, 2021). Figure 1.0 shows government debt as a percentage of GDP in the two regions depicted, Latin America and Sub-Saharan Africa, had not reached their current and historical heights in the pre-pandemic era.

Figure 1.0 Government Debt (as a Percentage of GDP) in Selected Regions



Source: Kose et al. 2020.

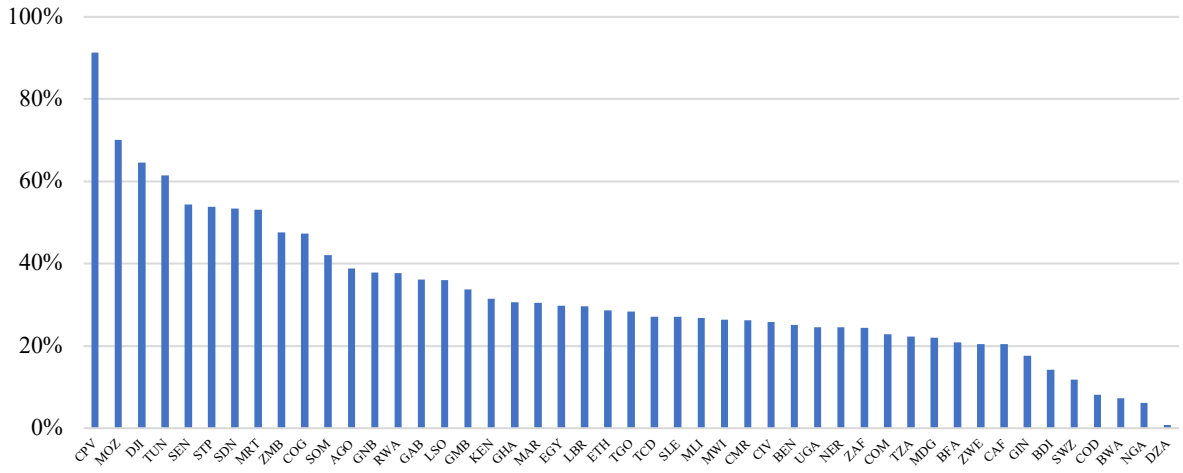
Forcusing now on Africa, we first use the conventional indicators of debt-to-GDP and debt-to-exports ratios to look at debt in that region. We utilize data from the World Bank's International Debt Statistics (IDS). Among all African countries, 48 of them have frequently reported to this system and have available data on external debt stocks. In this analysis, we observe debt stocks in 2019. We investigate only the public and publicly guaranteed (PPG) external debt, which comprises long-term external obligations of public debtors, including the national government, public corporations, state-owned enterprises, development banks and other mixed enterprises, subnational governments, autonomous public bodies, and external obligations of private debtors that are guaranteed for repayment by a public entity.[2]

In terms of the total PPG debt stock, Egypt recorded the highest among the 48 frequently reporting African countries, with external debt stocks of over $90 billion. After Egypt, the top ten African countries in terms of PPG debt stock were South Africa, Morocco, Angola, Kenya, Nigeria, Ethiopia, Tunisia and Ghana, each with an external debt stock of at least $20 billion in 2019. The total external debt stock of all 48 countries was $546.2 billion.

The average debt-to-GDP ratio of the 47 African countries with available data in 2019 was 32.4 percent, among which 8 countries had a ratio of over 50 percent (Figure 1.1). Of the 46 African countries with available data on debt-to-GNI, the average was 45.6 percent; among these 46 countries, 14 had a debt-to-GNI ratio of over 50 percent (Figure 1.2). Of the 32 African countries with available data on debt-to-export ratio, the average was over 188 percent (Figure 1.3).

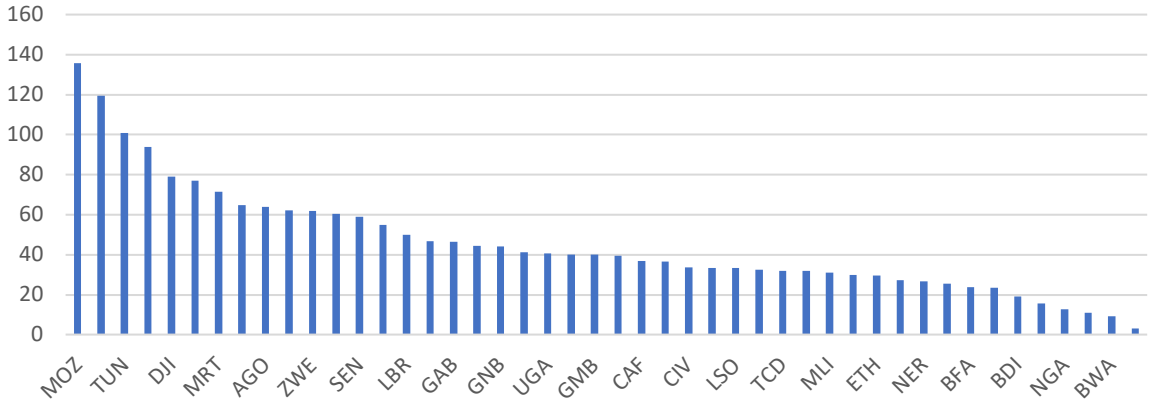
[2] Data are in current U.S. dollars unless otherwise noted.

Figure 1.1 External Debt Stocks, as a Percentage of GDP



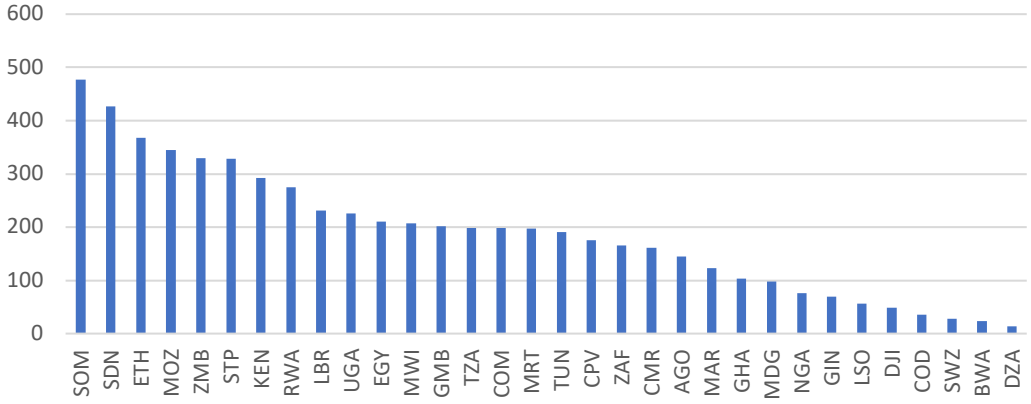
Source: Author and Yinyin Xu based on the World Bank IDS data.

Figure 1.2 External Debt Stocks, as a Percentage of GNI



Source: Author and Yinyin Xu based on the World Bank IDS data.

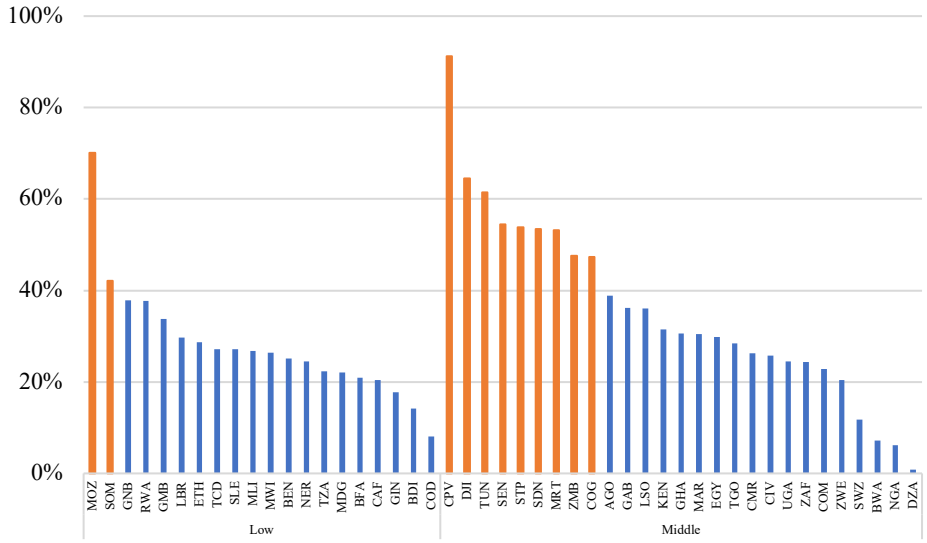
Figure 1.3 External Debt Stocks, as a Percentage of Exports of Goods, Services and Primary Income



Source: Author and Yinyin Xu based on the World Bank IDS data.

However, averages are often misleading. The debt accumulation pattern is diverse and country-specific. First, these conventional indicators vary among different countries. Taking debt-to-GDP ratio, for example, two low-income African countries (10 percent of the low-income group) now have a debt-to-GDP ratio over 40 percent, while nine middle-income African countries' debt-to-GDP ratios are over the benchmark (one-third of the middle-income group), shown by the orange bars in Figure 1.4.

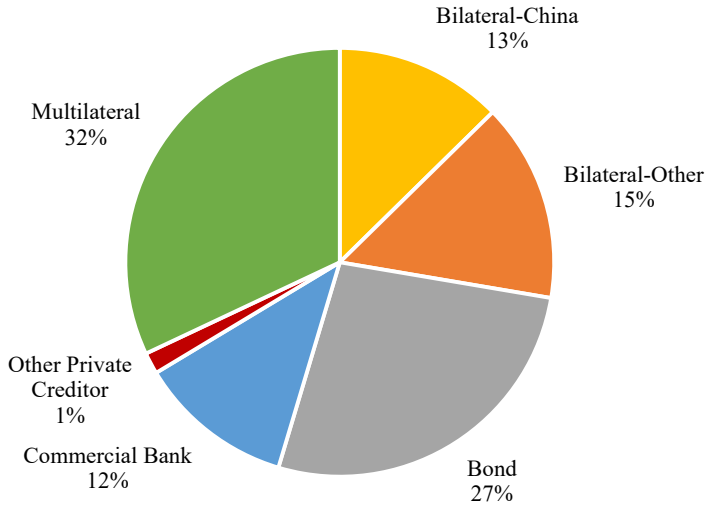
Figure 1.4 External Debt Stocks as a Percentage of GDP by Income Group



Source: Author and Yinyin Xu based on the World Bank IDS data.

Second, composition of the external debt stocks varies widely among these countries. The external debt stock can be divided by private and public creditors and can be further divided into the debt owed to bilateral creditors, multilateral creditors, bonds, commercial banks, and other private creditors. For all 48 countries studied, debt to multilateral creditors such as IDA and IBRD accounts for 32 percent of the total, debt to bilateral creditors accounts for 28 percent, and 27 percent is owed to bond holders.

Figure 1.5 Composition of External Debt Stocks in Africa

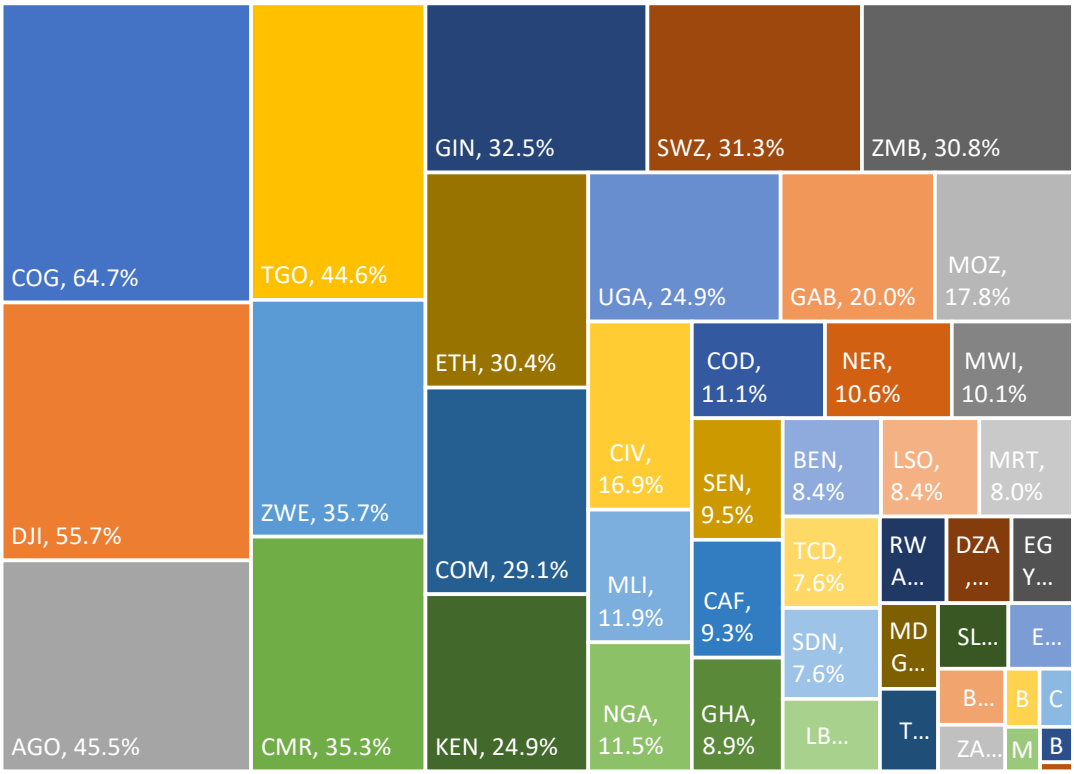


Source: Authors, based on World Bank data.

Based on 2019 data, the private sector now accounts for 40 percent of the continent's external debt, including bondholders, commercial banks and other private creditors. Bilateral creditors account for 28 percent of Africa's external debt, including those from China.

The debt ratios owed to China differ from country to country. On average, external debt to China accounts for 13.4 percent of the total debt stocks for the countries studied, which is lower than for multilateral organizations (32 percent; see Figure 1.5). For 30 of these countries, the external debt to China is less than 20 percent. However, the Republic of the Congo's debt to China makes up almost 65 percent of the country's total external debt, the largest in this analysis (see Figure 1.6).

Figure 1.6 External Debt to China as a Percentage of Total External Debt Stocks



Source: Author, based on World Bank IDS data.

Overall, 44 African countries reported external debt owed to China in 2019 with a total stock of around $72.8 billion. For some countries, the external debt stocks to China were over $5 billion; for most countries, the debt to China was less than $1 billion. Angola recorded the highest PPG external debt stocks to China, $15.7 billion. The five highest debtors to China were Angola, Ethiopia, Kenya, Egypt and the Republic of the Congo.

However, data limitations are an issue here. With limited data on sovereign debt accumulation and the lack of transparency in this field, we are not able to show the full picture of these countries' debt burden in recent years. An in-depth analysis needs country-specific analysis /reports, which is beyond the scope of this paper.

VOICE FOR DSR REFORM: PUBLIC ASSETS ARE KEY TO DEBT SUSTAINABILITY

In 2021, when this paper was written, the G20's Common Framework for Debt Treatments has had a weak response, with only three countries applying; it has thus failed to address the broader need for debt restructuring. In fact, the DSF has over-simplified the complexity and severity of the debt crisis. In the first place, the DSF only considers the total public and publicly guaranteed portion of external debt, failing to consider the composition of the external debt, which can be borrowed from different kinds of creditors (i.e., bondholders, bilateral lenders, multilateral lenders). Secondly, the DSF was considered "obsolete" even before the pandemic, since it only treated the "total public debt" and missed out on the fact that many governments were borrowing at market interest rates, both domestically and externally (Pinto 2019).

Second, the narrow focus on the debt-to-GDP ratio is misleading. For a starter, the measure does not distinguish debt caused by investment or debt caused by subsiding recurrent expenditure (salaries and pensions). Thus, it has an anti-public-investment bias, which is not unrelated to the neoliberal disregard of the role of government in economic growth and development. This anti-investment bias in the DSF for low-income countries is markedly outmoded in the current global environment where investment in public assets is badly needed. Fourth, long-term and short-term GDP is going to be affected by investment if it is effective (Lin and Wang 2017; Gallagher and Wang 2020).

A better understanding of what government owns (assets) and what government owes (debt) would promote better long-term financial management as well as help meet near-term needs. One of the significant potential benefits of using accrual accounting and a balance sheet approach to public financial management is the attention it focuses on the assets on a government's balance sheet, encouraging more reliable information on which assets the government owns and what those assets are worth, and better systems of asset management. In response to COVID-19, governments have taken a greater role in their economies and increased the size of their balance sheets. Nevertheless, their fiscal positions are more fragile than before. Under these circumstances, the value that can be extracted from the assets held by governments will become increasingly crucial, whether it is in the revenue generated by commercial assets or the services provided by assets that are held for public policy reasons (Ball and Detter 2020).

A focus on net worth (assets less liabilities) as the most comprehensive fiscal measure would encourage public investment, better management of public assets, and thereby a larger fiscal space;ultimately, it would lower the cost of public sector capital (Ball and Detter 2020). Furthermore, research shows that economies with higher public sector net worth experience shallower recessions and recover faster in the aftermath of economic downturns (Yousefi 2019). However, as we have noted, little attention has been paid to the measurement of public assets in the current debt discussions.

Governments everywhere and at every level own a vast array of commercial assets. According to the IMF, the value of public assets globally is twice that of global stock markets, twice that of global GDP and much larger than public debt. However, unlike listed equity assets, this public wealth is often unaudited, unsupervised and unregulated. Even worse, it is almost entirely unaccounted for in most countries. As a consequence, when formulating their budgets, most governments largely ignore the assets they own and fail to recognize that they could generate substantial yields that open up much-needed fiscal space. Governments could use this headroom to kick-start growth or

buffer themselves from future shocks, without resorting to debt, exhausting existing savings or being forced to revert to excessively painful austerity measures (Ball and Detter 2020).

Both assets and liabilities (including debt) are important for decision-makers. For example, the most important country-specific fiscal factor driving bond yields hence appears to be government net worth (Peppel-Srebrny 2018). The IMF not only continues to reinforce the need for governments to understand their real estate assets so as to achieve better management, but has also demonstrated how a better understanding would have an impact on the cost of capital (Koshima et al. 2021). Tools for measuring a sustainable economy and debt levels, using standard accrual accounting and budgeting techniques have been included in IMF manuals for more than two decades.

Yet, the debt sustainability framework does not reflect these insights. Furthermore, it does not recognize that, according to their public sector balance sheets, countries that invest the proceeds of borrowing are in stronger positions than those that use debt to finance consumption spending. The failure to reflect this difference, by focusing on debt (as in the case of DSA) rather than net worth, is problematic because the accrual accounting linking the public sector balance sheet and the budget would not be functioning under such circumstances. Without being able to budget appropriately and report on an accrual basis, the DSA not only fails to measure debt sustainability accurately, but is also misleading and has an anti-investment bias (Gallagher and Wang 2020). The DSA doesn't necessarily incentivize least developed countries (LDCs) to borrow and invest in public infrastructure, since the DSA does not distinguish borrowing for investment from borrowing for consumption. In other words, their borrowing for investment does not count!

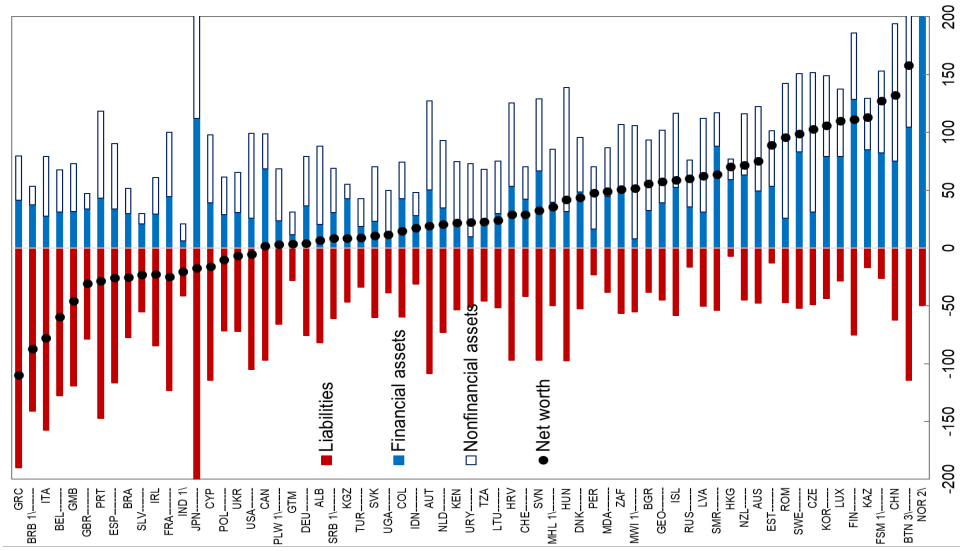
It is time for markets and rating agencies to look more kindly at the increase in public debt if there are productive assets on the other side of the balance sheet. IMF data on government assets shows that when governments know what they own, they can make better use of the assets for the well-being of all their citizens. Improved management of government assets may also have a positive impact on a country's sovereign credit rating, which affects its cost of borrowing. Clearly, the monetization of public assets generates receipts that can be used to pay down existing debt, to reduce the need for new borrowing or to build the government's financial buffers. A reduction in a government's debt load, or a slowdown in its pace of accumulation, and an increase in government financial assets directly improve key metrics that the three global rating agencies use in their sovereign rating models. In addition to assisting sovereign credit ratings, more efficiently managed assets would contribute to a higher rate of real GDP growth, generate dividends or other cash flows for the government budget, and lower operating costs, all a major benefit to society (Detter and Amin-Salem 2019).

The current research on public sector balance sheets, and on "what governments own and owe" is welcome since it emphasizes that it is "public sector net worth" that matters (see Figure 2.1).

This rationale applies to Africa as well. The following box, Public Assets — Key to Africa's Future Green Growth, show that public assets are a vastly under-estimated and untapped resource in Africa, especially considering the large land areas and green natural endowments, and the potential for urbanization and agglomeration, which can increase the value of real estate.

Singapore is a ready example of how the proper use of assets has boosted development. When Singapore and Jamaica achieved independence in the early 1960s, both island nations had roughly the same population, life expectancy and GDP per capita. Today, they are poles apart. Not only has Singapore's population grown three times faster than Jamaica's, but its per capita GDP is also 10 times bigger, and its average life expectancy is 9 years longer. Against all odds, the tiny Asian nation with no significant resources, not even basic utilities such as water or the capacity to generate electricity,

Figure 2.1 What Governments Own and Owe: Analyzing Public Wealth Using Balance Sheets Shows What Governments Own and What They Owe



Source: IMF Fiscal Monitor, Fall 2018.

Box 2.1 Public Assets — Key to Africa's Future Green Growth

Public assets are a vast unknown and untapped resource. The value of public commercial assets is twice that of global stock markets, and twice the global GDP (IMF 2018). The total value of public assets in Africa is most likely in excess of $5.2 trillion. If professionally managed inside a Public Wealth Fund (PWF), they could generate an additional $80 billion in revenues every year (or 3 percent of GDP annually), which is more than most countries collect in corporate taxes (IMF 2019).

Public commercial assets consist of both real estate assets and operational assets, such as transport assets and utilities, and, in some countries, financial institutions and other corporate assets.

Unlike listed equity assets, public wealth is unaudited, unsupervised, and often unregulated. Sometimes, it is even almost entirely unaccounted for. Poor transparency in the public sector remains an obstacle to accountability and oversight. Only a very minor part of the public portfolio is known and transparent through annual reports.

According to IMF research, government-owned operational assets are on average a third less productive than private firms' (IMF 2020).

The largest segment of any portfolio of public commercial assets is real estate. Government-owned commercial real estate assets account for a significant portion of each country's land. But governments typically know about only a fraction of these properties, since they do not have a comprehensive list of the assets nor even a proper underlying *cadastre* or land registry, a system that defines the dimensions, locations and titles of all land parcels.

Even in the United States, indicative valuations of public real estate in urban areas is substantial, with assets unknown to governments and stakeholders at a value that exceeds the economic output of the city. According to this research, the public sector in the US is the biggest property owner by far, owning a portfolio of real estate representing half of the total market value of the city (IMF 2018). In the case of Pittsburgh, for example, the difference between book value and indicative value was 70 fold. If properly accounted for and professionally managed, this real estate portfolio could generate additional income well beyond what a city raises in taxes today. Such information could also if visible and managed professionally, prevent cities and countries from going bankrupt and bond holders losing money. Thus, public assets, especially public real estate, should be estimated in African countries.

Source: Detter 2021.

has thrived thanks to innovative and bold thinking. There are many reasons why Singapore has performed so much better than its peers over the succeeding half-century, including the development of human capital and a strong rule of law. However, a major source of Singapore's economic attainment was the creation of robust economic institutions and the effective use of public assets. Proper use of public commercial assets has been a core component of Singapore's strategy to move the economy from "developing" to "developed" status in a single generation. Singapore's founders introduced an innovative and unorthodox separation of economic policy from the management of public assets (Detter and Amin-Salem 2019).

The following tables present some evidence that public sector assets, even though not carefully measured through accrual accounting, are still non-negligible. In other words, the asset and liability picture in Africa is not as dismal as when it is seen only from the DSA lens, which ignores the asset side. However, the data are not comprehensive and are far from adequate. As the text in Box 2.1 advocates, there is a great need for these countries to measure these assets carefully so that they can be better managed professionally.

Table 2.1 Cases of African Countries' Public Sector Balance Sheets

A. Tanzania: Public Sector Balance Sheet, 2014, Percentage of GDP

	General Government	Nonfinancial Public Corps	Consolidated Public Sector
TOTAL ASSETS	123.7	31.9	101.3
Of which: Nonfinancial Assets	99.7	14.4	73.5
Financial Assets	24.0	17.6	27.8
TOTAL LIABILITIES	77.9	31.9	96.2
Of which: Debt securities	6.6	—	4.7
NET FINANCIAL WORTH	-53.9	-14.2	-68.4
NET WORTH	**45.8**	**—**	**5.2**

Source: IMF 2018.

B. South Africa: Public Sector Balance Sheet, 2016, Percentage of GDP

	General Government	Nonfinancial Public Corps	Financial Public Corps	Consolidated Public Sector
TOTAL ASSETS	208.3	49.6	72.3	269.0
Of which: Nonfinancial Assets	156.7	44.6	2.5	203.7
Financial Assets	51.6	5.0	69.9	65.3
TOTAL LIABILITIES	56.8	49.6	72.3	117.5
Of which: Debt securities	47.4	7.2	1.8	41.8
NET FINANCIAL WORTH	-5.2	-44.6	—	-52.3
NET WORTH	**151.5**	**—**	**-2.5**	**151.5**

Source: IMF 2018

C. The Gambia: Public Sector Balance Sheet, 2016, Percentage of GDP

	General Government	Nonfinancial Public Corps	Financial Public Corps	Consolidated Public Sector
TOTAL ASSETS	47.3	35.8	26.1	61.0
Of which: Nonfinancial Assets	13.4	21.8	0.7	35.8
Financial Assets	33.9	14.0	25.4	25.2
TOTAL LIABILITIES	93.5	35.8	26.1	107/2
Of which: Debt securities	78.4	0.8	1.1	61.4
NET FINANCIAL WORTH	-59.5	-21.8	—	-82.0
NET WORTH	**-46.2**	**—**	**-0.7**	**-46.2**

Source: IMF 2018

D. Uganda: Public Sector Balance Sheet, 2016, Percentage of GDP

	General Government	Nonfinancial Public Corps	Financial Public Corps	Consolidated Public Sector
TOTAL ASSETS	109.3	32.1	—	126.2
Of which: Nonfinancial Assets	97.4	5.8	—	103.2
Financial Assets	11.9	26.3	—	22.9
TOTAL LIABILITIES	60.5	32.5	—	77.7
Of which: Debt securities	—	—	—	
NET FINANCIAL WORTH	-48.6	-6.2	—	-54.8
NET WORTH	**48.8**	**-0.4**	**—**	**48.5**

Source: Selected African countries based on IMF (2018). The data are inadequate on public sector balance sheets but properly designed asset mapping can help (See Detter 2021 on asset mapping).

DEBT VERSUS EQUITY: A FRAMEWORK DERVIED FROM CHINA'S EXPERIENCE

History has shown structural transformation to be an engine of growth and job generation. Yet, mainstream economics has paid little attention to structural transformation and industrialization for two decades. Too few resources have been invested in the economic and industrial infrastructure, causing deindustrialization in many countries (Lin and Wang 2017).

Over the last few decades, China could have been faced with a debt crisis as many low- and middle-income countries are today. However, the widely anticipted debt crisis and subsequent collapse did not materialize. This can be explained by the so-called reforms with Chinese characteristics, and growth-promoting policies that the country adopted. We summarize them here:

- Utilizing foreign direct investment (FDI) and Special Economic Zones (SEZs) more vigorously to catalyze innovation (Zeng 2021);
- Introducing original equipment manufacturers (OEM), first in SEZs and later in high-tech, green and renewable sectors to upgrade existing export sectors;

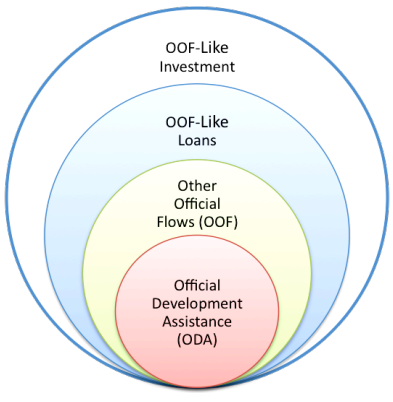
- Broadening the knowledge base and upgrading the skills of the labor force;
- Enhancing the capacity of private and public financial institutions, including national development banks; utilizing patient capital; relieving the shortage of foreign exchange by various measures including incentivizing export, attracting FDI, and macro-prudential capital flow management or capital controls (Lin and Wang 2017; Yu 2021).
- China's total net worth in 2019 was six time its GDP and the government sector had a net worth of 165 percent of GDP. China's debt is sustainable as net worth is total asset minus total liability. (See Annex 1, China's national balance sheet.)

Western aid programs have not — and will not — tell developing countries how to use industrial policies to develop manufacturing sectors and climb up the technology ladder, because of their own vested interests. In addition, industrial policies have been a taboo in many multilateral and bilateral development institutions (Lin and Wang 2017, 158). Since the 1960s, over $4.6 trillion (in constant 2007 dollars) in gross official development assistance (ODA) has been transferred to developing countries, including bilateral and multilateral aid. Despite this, a substantial amount of the world's population remains in extreme poverty and is experiencing stagnant growth. A recent study has found that the IMF structural adjustment programs, which require countries to undertake policy reforms in exchange for loans, undermine investor confidence and increase sovereign borrowing costs (Reinsberg et al. 2021).

In our view, there is a need to "go beyond aid" with a broader concept of South-South Development Cooperation. Differing from the OECD's definition of ODA, South-South Development Cooperation (SSDC) combines trade, aid, and public and private investment, utilizes the comparative advantages of each country, and helps to align the incentives among development partners and prevent "aid fatigue".

As Figure 3.1 proposes, we can expand definitions of development finance to include narrower concepts of aid and concessional lending, and broader concepts of trade finance, infrastructure loans and equity finance. Similar to the monetary policy instruments, M0, M1, M2, M3 and total social financing, we can define DF1, DF2, DF3 and DF4 in development finance. A new set of clearer definitions would facilitate transparency, accountability and selectivity by development partners, encourage Sovereign Wealth Funds (SWFs) and pension funds to invest in developing countries, and facilitate blended financing or Public-Private-Partnership (Lin and Wang 2017, 175).

Figure 3.1 Expanding the Definition of Development Finance



Source: Lin and Wang 2017, p. 175. The circles correspond to DF1= ODA; DF2=ODA+OOF; DF3=DF2+ OOF-like loans; and DF4=DF3+OOF-like investment. Another category could be added separately for SSDC that cannot be monetized.

Equity is certainly a new area of development finance. As the newly established US International Development Finance Corporation (DFC), which was established by the BUILD Act of 2018, shows, one of its new finance instruments is equity finance. The BUILD Act expanded funding authority of the DFC to $60 billion, and authorized new financial tools including equity financing, first-loss guarantees, technical assistance and feasibility studies. (See also in DFC 2021 the case of the USDFC helping Ecuador). There is a taxonomy of financial instruments for market access countries including equity (patient capital, discussed in the next section). This is perhaps an area of attention for African governments.

In the broader context of development financing, the patterns of new finances, debt (loans and bonds) versus equity, are linked. New national development banks and equity development funds are being established everywhere. For example, India recently established a new national infrastructure development bank, aiming to raise $41 billion in a few years (Business Insider 2021). Researchers have shown that about 147 developing countries/economies have new DFIs (Xu et al.'s study on the definitions of DFI and their database, 2019/2021). More generally, Public Wealth Funds (PWFs), including Urban Wealth Funds can be established to promote professionally managed public assets and achieve a higher rate of returns (see Section 4, subsection 1).

But can governments invest successfully in selected startups and corporations? Historical evidence indicates that the short answer is "yes", with two provisos. First, government ownership must be institutionalized according to the highest standards of corporate governance and structured as Public Wealth Funds (PWFs) that combine arm's-length independence from day-to-day politics with active and competent commercial management, as well as high-level transparency as if the fund were a listed holding company. Second, the creation of such funds should be accompanied by a wider rethink of public sector accounting to take into account both the assets and liabilities side of the public sector balance sheet, in just the same way as a private firm does. This is the approach that we develop over the course of this paper (Detter and Fölster 2020). In Box 3.1, we highlight/introduce the potential that SWFs and PWFs hold for public assets. A PWF acting as a holding company for public commercial assets offers a politically palatable way to shift state assets towards infrastructure in a way that could achieve three goals: increasing funding of infrastructure; putting infrastructure decisions on a sounder economic footing; and reducing government's direct and politically-motivated access to those assets. PWFs can help governments manage projects and encourage FDI by providing a window to international best practices and hands-on experience and management. With the same capacity to manage commercial risk as any private sector partner, any PPP would be on equal terms with any private sector partner. This would significantly reduce, or even eliminate, the risk of an undue transfer of value to the private sector, one of the common criticisms against PPPs.

SWFs are in a financial position to invest in large infrastructure projects, but their expertise is financial rather than structural and operational; one important question is whether they have the competence that successful infrastructure investments require. National infrastructure investment can be boosted and managed better by letting a PWF shift or sell state assets in other commercial holdings and invest in infrastructure consortia in their own country.

Box 3.1 Sovereign versus Public Wealth Funds

A Sovereign Wealth Fund (SWF) is primarily concerned with managing reserve liquidity, typically investing in securities traded on major mature markets. SWFs are designed to optimize a portfolio by trading securities to achieve balance between risk and returns.

- An example is GIC of Singapore.

A Public Wealth Fund (PWF) is an asset manager, concerned with active management of a portfolio of operational assets. PWFs seek to maximize the portfolio value through active management including the development, restructuring, and monetization of the individual assets.

- An example is Temasek of Singapore.

HOW CHINA HAS HELPED STRUCTURAL TRANSFORMATION IN AFRICA

The continued emergence of new COVID variants, together with the travel restrictions and trade / supply chain disruptions, have highlighted the risks that lie in global interdependence and the critical importance of tackling bottlenecks in infrastructure.

The first critical lesson of the pandemic is this: Development starts at home. Rather than depending on cross-border flows, countries must recognize and build on their own wealth — that is, the assets and endowments that lie within their borders. Produced capital, human capital, and natural capital are three basic capital assets key to development. African countries have a good level of produced capital, human capital and natural capital, indicating that the structure of their factor endowment is quite rich and appropriate for balanced growth.[3] By building its competitive advantage, each country can therefore increase its export and earn more income and foreign exchange. In other words, building on the foundation of all capital in various forms, these countries can target their respective advantages, which depend on their endowments. The countries rich in human capital can develop their human capital intensive export sectors such as garment, footwear and other light manufacturing sectors, while countries rich in natural capital can concentrate on agribusiness, forestry and mineral export or nature-friendly tourism. Furthermore, if the host country continues to invest in these three assets areas, the country's credit worthiness will become stronger.

Second, global supply-chain disruptions have clearly inflicted serious pain on the world, which highlight the critical importance of infrastructure bottlenecks. But for many low- and lower-middle-income countries, the pandemic has exposed even more fundamental deficiencies, such as a lack of health-care personnel and resources, from hospital beds to ventilators. For some, it is the inability to deliver clean water, electricity and sanitation that is choking the economy.

A core problem is that all that traditional North-South aid did not adequately address infrastructure bottlenecks. This partly explains why African countries have often welcomed Chinese investment. China has sponsored and completed projects that have addressed Africa's bottlenecks in economic transformation, which represent public sector assets, not just debt. In order to evaluate the veracity of this observation, we examine China-invested projects in Africa in the following sections and check whether they have address bottlenecks in African countries.

Identifying Africa's bottlenecks

First of all, to identify infrastructure bottlenecks in Africa, we examined a panel dataset of nine broad indicators of hard and soft infrastructure needs across all 54 African countries from 2000 to 2017 using data from the World Bank, the Institute for Health Metrics and Evaluation (IHME) and GlobalEconomy.com (Table 4.1).

For each indicator and country, we first calculated the average value over 2000-2017. We then separated the countries into two income groups: middle-income and lower-income. Second, for each country within its income group, we determined the ranked order (in percentiles) of each indicator. For most of the indicators, a higher ranking order (in percentiles) indicates better access within the income group and hence lower urgency for investment. The exception is the category of the environment, where a higher ranking order (percentile) indicates more emissions or greater deforestation within the income group, and hence more urgency for investment.

[3] Data on endowment are available via the World Bank "Changing Wealth of Nations" database, 2019.

Table 4.1 Step 1: Sectors and Indicators for Bottleneck Identification

Category	Indicator and Unit
Hard Infrastructure	**Hard Infrastructure**
1. Water 2. Energy 3. Road/Rail/Port/Air Transportation 4. Telecommunication 5. Internet Access	1. People using at least basic drinking water services (percent of population), 2000-2017 (Source: WDI). 2. Access to electricity (percent of population), 2000-2017 (Source: WDI). 3. Road quality, 2006-2017; Railroad infrastructure quality, 2009-2017; Port infrastructure quality, 2006-2017; Air transport infrastructure quality, 2006-2017, using the Borda's method[4] (Source: The Global Economy). 4. Mobile cellular subscriptions (per 100 people), 2000-2017 (Source: WDI). 5. Individuals using the Internet (percent of population), 2000-2017 (Source: WDI).
Soft Infrastructure	**Soft Infrastructure**
1. Education 2. Health 3. Environment 4. Government Effectiveness	1. Learning-Adjusted Years of School, 2017, and Literacy Rate, adult (total percent of people ages 15 and above), average of 2000-2017 using the Borda ranking method. (Source: WDI). 2. Healthcare Access and Quality Index, 2016 (Source: IHME). 3. CO2 emissions (metric tons per capita), average of 2000-2017, and Annual Deforestation (percent Of Change), average of 2000-2015 using the Borda method (Source: WDI). 4. Government Effectiveness of the Worldwide Governance Indicators, average of 2000-2017 (Source: WGI).

Source: Author.

For each country, we identified four out of five hard-infrastructure indicators and three out of four soft-infrastructure indicators as bottlenecks. We ordered these bottlenecks by the level of urgency from 1 (most urgent) to 4 (least urgent) for hard infrastructure and 1 to 3 (most to least urgent) for soft infrastructure. For each country, the lowest ranking hard or soft indicator within its income group was defined as "Bottleneck 1", that is, the bottleneck with the greatest needs, the second lowest ranking as "Bottleneck 2", and so on. The two highest ranking hard indicators and the highest ranking soft indicator for each country were not considered bottlenecks, since their urgency was minimal. This process can be expressed as:

$$\text{Bottleneck 1 for country } i = \min(R_{i,j}), \text{ where } j = 1, \ldots, 5$$

$$\text{Bottleneck 2 for country } i = \min(R_{i,-j^*}), \text{ where } j = 1, \ldots, 5$$

Figure 4.1 shows the results of the process of identifying bottlenecks. (For technical details, please see Lin and Wang, 2017, 124-129). We note that Africa's bottlenecks have evolved over a relatively long period of time, and that, for some indicators, what constitutes a bottleneck has changed with time. Most African countries have made progress throughout the last decade of development, in

[4] For certain sectors such as transport, an indicator may be missing for some countries and one single indicator won't be sufficient to approximate the reality so as to identify the bottlenecks. The Borda ranking procedure is thus employed by assigning each country a percentile ranking equal to its rank in each component criterion. Each country's percentile rankings over all the components are averaged, and these averages are used to re-rank the countries, resulting in one index. For more details regarding the Borda ranking techniques, see Thomas and Wang (1996).

both soft and hard infrastructure. For example, while access to the internet was not a major bottleneck for many countries in earlier years compared to the other sectors, it is now becoming a more urgent need for many. This also coincides with the global digital revolution trend in the past two decades.

Figure 4.1 Infrastructure Bottlenecks: All African Countries, 2000-2017

a. Hard Infrastructure Bottlenecks, All African Countries, 2000-2017

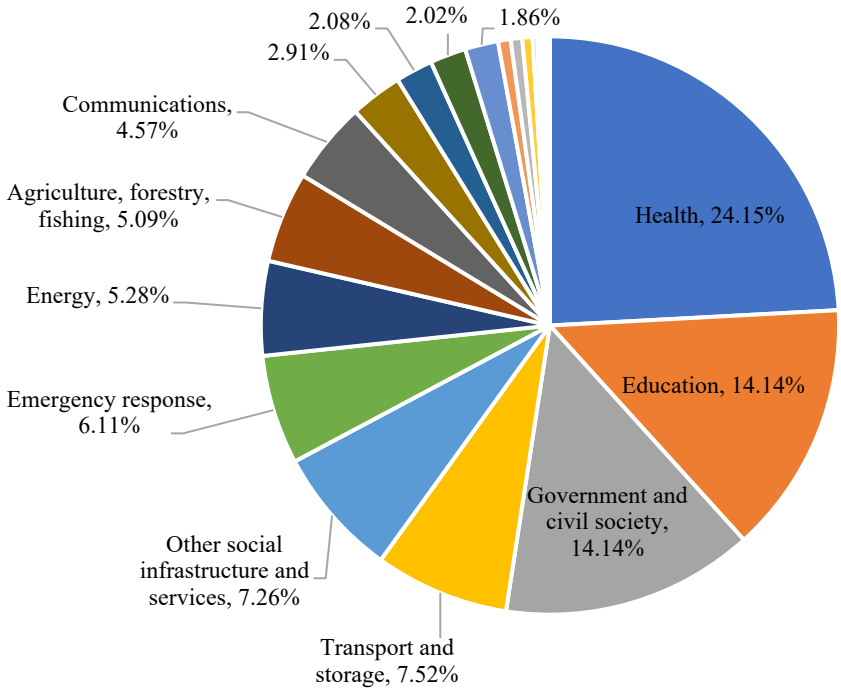
b. Soft Infrastructure bottlenecks, All African Countries, 2000-2017

Source: Authors. For methodology, see Step 1 in Lin and Wang 2017, 124-129.

Step 2: Infrastructure Projects in Africa financed/co-financed by China

The Global Chinese Development Finance Dataset, version 2.0, developed by AidData at the College of William & Mary, provides detailed information on projects financed or co-financed by China in each sector in 2000-2017. The dataset contains 13,427 projects in 165 countries. Here, we used a subset of the dataset by imposing criteria on the projects: We kept only those projects that were marked "completed", and those which were checked by a triangulation method to be "recommended for aggregates".[5] Our subset consisted of 3126 projects in Africa, all completed and "recommended for aggregates", that were distributed in 24 sectors: action relating to debt (58); agriculture, forestry, fishing (159); banking and financial services (2); business and other services (5); communications (143); developmental food aid/food security assistance (65); disaster prevention and preparedness (2); education (442); emergency response (191); energy (165); general budget support (8); general environmental protection (7); government and civil society (442); health (755); industry, mining, construction (63); other commodity assistance (18); other multisector (22); other social infrastructure and services (227); population policies/programmes and reproductive health (1); reconstruction relief and rehabilitation (1); trade policies and regulations (20); transport and storage (235); water supply and sanitation (91) and unallocated/unspecified (4). Figure 4.2 shows the distribution of the 1,326 projects into the broader sectors.

Figure 4.2 Decomposition of the 3126 Completed and "Recommended for Aggregates" Projects in Africa Financed or Co-financed by China in 2000-2017, by Sector



Source: Aiddata.org, accessed on 28 November 2021.

[5] This helps identify formally approved, active, and completed Chinese government-financed projects, and excludes all cancelled projects, suspended projects, and projects that never reached the formal approval (official commitment) stage. For details on methodology, see Custer et al. 2021.

Step 3: Did Infrastructure Projects Financed/Co-financed by China in Africa from 2000-2017 Address Bottlenecks During That Time?

To what extent did infrastructure projects financed/co-financed by China match up with Africa's bottlenecks? A short answer is that Chinese financed projects have matched up with African countries' bottlenecks for 76.1 percent of the 468 hard infrastructure and 73.4 percent of the 1246 soft infrastructure projects in 2000-2017.[6]

We merged the datasets on bottlenecks and Chinese financed projects by country code, which allowed us to see if the locations of the China-financed projects matched those of the bottlenecks in the period of 2000-2017, hitting the bottlenecks in recent years (see Figure 4.3). We also calculated some probabilities of projects "hitting" the bottlenecks, using the following method:

Probability of (hitting one of the 4 bottlenecks)
= (number of matches)/total projects
Probability of (hitting one of the bottleneck i)
= (# of projects hitting Bottleneck i)/total projects

The result is as follow:

- In hard infrastructure, the probability of hitting Bottleneck 1 to 4 was 17.5 percent; of hitting Bottleneck 2 was 19.9 percent; of hitting a Bottleneck 3 was 12.8 percent; and of hitting a Bottleneck 4 was 25.9 percent. The total probability of hitting one of four bottlenecks was 76.1 percent.
- In soft infrastructure, the probability of hitting Bottleneck 1 to 3 was 30.0 percent; Bottleneck 2, 21.3 percent; and Bottleneck 3, 27.1 percent. The total probability of hitting one of the three bottlenecks was 73.4 percent.

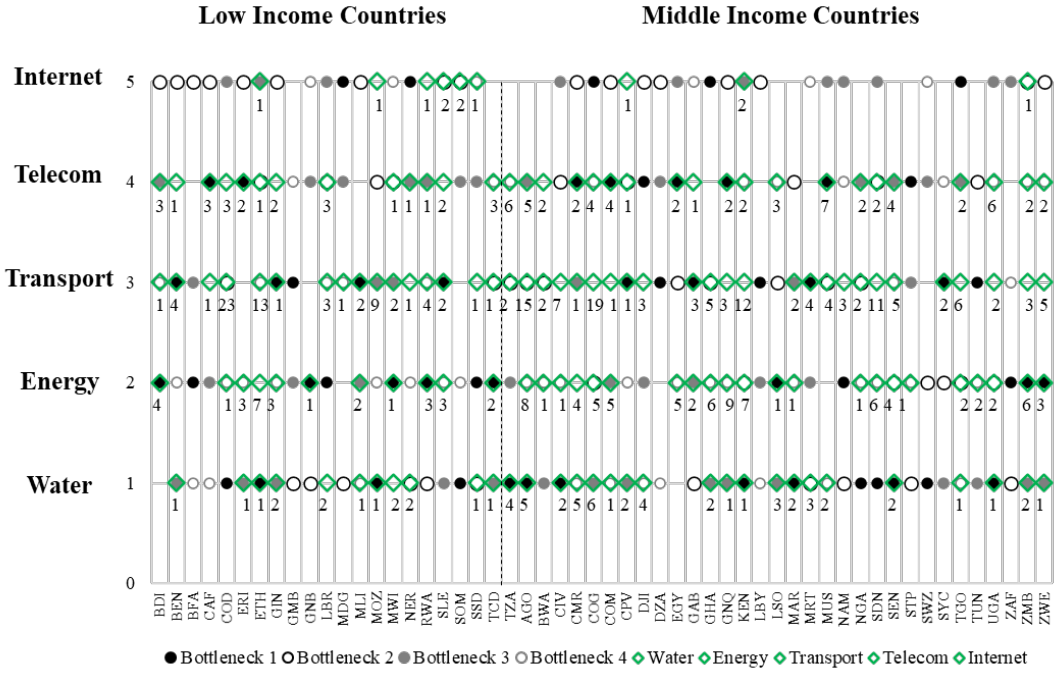
Infrastructure, such as hydropower stations, power grids, roads, ports and bridges, are assets of the public sector. These infrastructures can generate revenues and create jobs. If planned carefully, this can help generate economic growth, develop manufacturing, create jobs and reduce poverty. Infrastructure funding is of such strategic importance, and, in places, the funding gap is so large that it is necessary to encourage international investment fo fill it.

China has been actively helping African countries in targeting their respective comparative advantages. In the past 18 years, approximately 25 percent of all infrastructure development in Africa has been funded by the Chinese government, with the African government contributing an estimated 40 percent. There is little empirical evidence to support the accusation of "debt trap diplomacy" consequently made by the media.

[6] Here, we used aiddata.com version 2.0 and controlled for 3,126 completed and "Recommended For Aggregates" projects in Africa. We end up with 468 projects located in five sectors for hard infrastructure, and 1,246 projects located in four sectors for soft infrastructure, conducted in 48 African countries. No projects were found in six countries.

Figure 4.3 Infrastructure Projects Financed/Co-financed by ChinaMatched With Bottlenecks for 76 Percent of Hard Infrastructure Projects and 73 Percent of the Soft Infrastructure Projects in Africa During 2000-2017

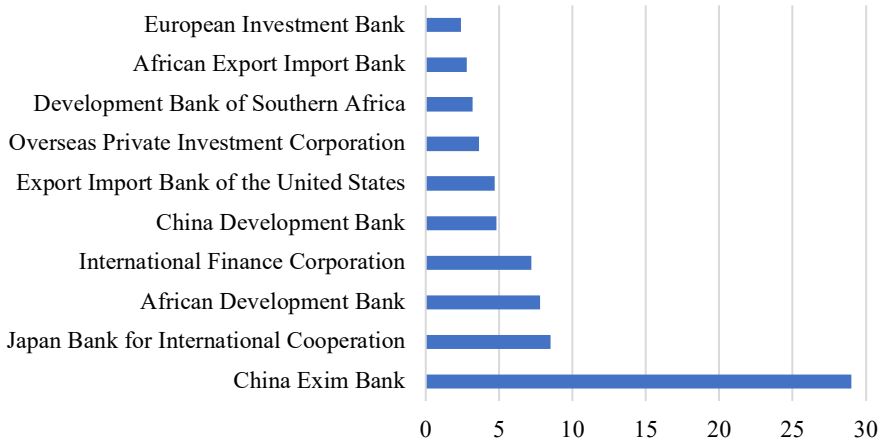
a. Hard Infrastructure: 76 percent of the projects matched bottlenecks in Africa, 2000-2017



b. Soft Infrastructure: 73 percent of the projects matched bottlenecks in Africa, 2000-2017

Source: Author and Yinyin Xu.
Note: the previous two steps were merged using country codes. The numbers below each row indicate the number of projects matched in that particular subsector/indicator.

Figure 4.4 Top Infrastructure Lenders in Africa, 2008-2020, US$ Billion



Source: Baker Mckenzie, 2021.

In sum, too little attention has been paid to the public assets financed and constructed by the Chinese investments jointly with the host countries. In Africa alone, Chinese companies have utilized various funds to help African countries build and upgrade more than 10,000 km of railways, nearly 100,000 km of highways, nearly 1,000 bridges and 100 ports, and 66,000 km of power transmission and distribution. They have also helped to install 120 gigawatts (GW) of power-generating capacity, a communications backbone network of 150,000 km and a network service covering nearly 700 million user terminals. Built and operated by Chinese companies, the Mombasa-Nairobi Railway was the first modern railway to be built in Kenya in 100 years.[7] It bears repeating that these completed projects have formed a part of African countries' public assets, and generated huge externalities that benefit all other sectors and other investors. Connectivity has been created across the continent and between the continent with the rest of the world. In the meantime, these investments in infrastructures have increased local employment and reduced illegal immigration to developed countries (Jin 2021).

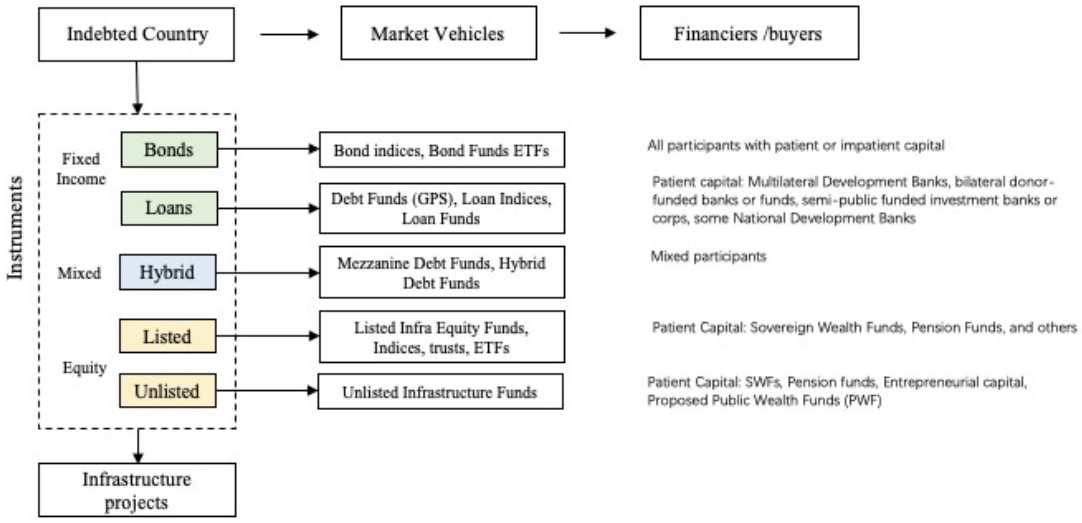
In addition, patient finance, or patient capital, is critical to mission-oriented development strategy including Green Transformation (Mazzucato 2015, 2021; Lin and Wang 2017). The Chinese savings rate remains high by global standards, reflecting a long-term orientation in Asian culture, and it has long been a significant factor in China's long-term economic growth. The high saving rate provides a solid foundation for sustained capital accumulation. Investigating the implications of Chinese patient capital in Latin America, Stephen B. Kaplan (2018) found that "Chinese state-to-state lending reduces governments' reliance on conditionality-linked Western financing, giving them more autonomy to use budget deficits to intervene in their economies." "These results suggest that Chinese financing could be a developmental opportunity, but only if governments invest wisely. Otherwise, by lending without policy conditions, China may be encouraging developing country governments to spend without bounds, sowing the seeds for future debt problems" (Kaplan 2018; Mazzucato 2015).

Figure 4.5 provides a taxonomy of infrastructural financing instruments, drawing on the OECD's "Institutional Investors and Long Term Investment" project. The coverage of instruments is comprehensive, spanning all forms of debt and equity and risk mitigation tools deployed by governments and agents. Under this framework, patient capital serves as the financier of infrastructure financing instruments with a long-term horizon. International multilateral financial organizations such as

[7] China's State Council Information Office released awhite paper titled "China and Africa in the New Era: A Partnership of Equals." http://www.news.cn/english/2021-11/26/c_1310333813.htm

the World Bank, regional development banks as well as bilateral donor-funded development banks/ funds play critical roles in turning domestic public savings into international long-term development funds. Furthermore, the unlisted equity-like instruments or unlisted infrastructure funds are also better suited for patient capital than the short-term debt instruments for impatient capital (such as hedge funds) that can be traded frequently (OECD 2015; Lin and Wang 2017).

Figure 4.5 A Taxonomy of Financial Instruments for Infrastructure Finance and Patient Capital Needed



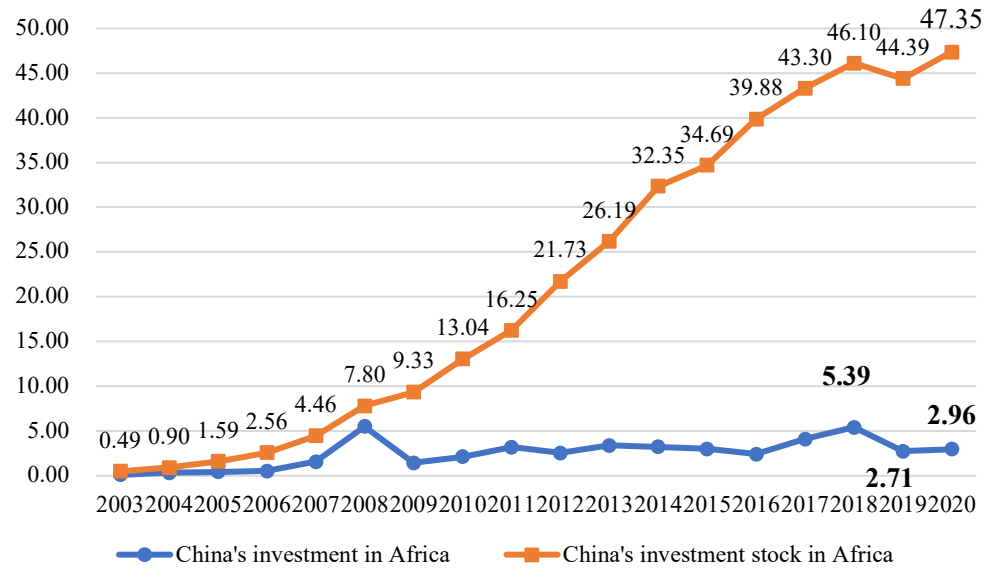
Source: Lin and Wang 2017 on patient capital, and OECD 2015.

Chinese investments (both public and private) have already played an important and vital role in accelerating African countries development. China's outward direct investment (another part of patient finance) in Africa has been expanding, even during the pandemic, increasing to $2.96 billion in 2020, with an estimated $47.35 billion in stock of Chinese direct investment in Africa. Data from the Ministry of Commerce of the People's Republic of China (MOFCOM) reveal that China's flow of outward direct investment in Africa increased by 9.2 percent as compared to $2.71 billion in 2019, despite the impact of COVID-19. The new investment covered 47 African countries. Investment in 19 countries increased by more than 10 percent, and was dominated by the private sector (see Figure 4.6). In particular, investments in scientific research, technical services, transport, warehousing, postal services, residential services, repairs, health and social work and other service sectors increased by more than 100 percent (MOFCOM, CABC 2021).

Futher, China's investments help create jobs in Africa. The established infrastructure has laid solid foundations for industrial development and attracted Chinese private/patient capitals (see Table 4.1, CABC 2021). An EY study for the period of 2016-2020, summarized in Table 4.2, shows that Chinese FDI has created more jobs because it was concentrated in labor-intensive industries [8].

[8] For instance, Huajian, a Chinese shoe producing company headed by Huarong Zhang, has been investing in Ethiopia's budding manufacturing sector since 2013, whose two factories have jointly provided direct jobs to more than 7,000 Ethiopians, with a productivity of about 5 million pairs of shoes annually. In 2019, Huajian invested up to US$ 0.1 billion in Ethiopia's Jimma Industrial Park to construct shoe manufacturing plants and coffee processing plants. The Park is expected to create up to 15,000 jobs for the locals.

Figure 4.6 China's Direct Investment in Africa, 2008-2020, in US$ Billion



Source: MOFCOM, CABC 2021.

Table 4.2 China's FDI Has Created More Jobs in Africa, 2016-2020

Country	Projects	Jobs created (,000)	Capital investment (US$ billion)
China	259	170.1	70.6
USA	401	54.0	23.7
France	346	46.2	19.5
UK	275	35.2	16.3
Germany	203	36.5	9.7
UAE	189	36.3	23.8
Switzerland	180	14.7	7.3
South Africa	133	12.1	8.2
Japan	115	38.5	8.9
Spain	101	10.1	4.8

Source: EY 2020.

POLICY RECOMMENDATIONS AND CONCLUSIONS

This paper argues Africa appears to be in grave debt distress when viewed using the DSA lens, but may be in better shape if viewed with the lens of a public sector balance sheet. China, which is sometimes portrayed as providing a "debt trap" that is detrimental to Africa's prospects, has actually contributed to the accumulation of public assets that have addressed key bottlenecks in Africa's transformation, as shown in Section 4. Moreover, when countries were in debt distress, China has been more apt to be accommodating than the conventional wisdom suggests.

China has been the largest contributor to the DSSI, and postponed debt repayment totaling over $2.1 billion under the initiative. The country has committed to lending $10 billion from its shares of SDRs to developing countries in debt distress. But more needs to be done. Chinese lenders should pay more attention to the macroeconomic and debt sustainability risk of the borrowing countries. Further, more knowledge and skills are to be acquired in handling debt restructuring. Finally, Chinese lenders should be fully aware of the need to have transparency in order to coordinate with all the other creditors in cases where there is a need for timely and orderly debt restructuring (Jin 2021). Box 5.1 summarizes information about China's various activities around debt relief, with a focus on Africa.

Box 5.1 Modalities of Chinese Debt Relief

The dataset consolidated by the China Africa Research Initiative at the Forum on China-Africa Cooperation (FOCAC) claims to have recorded about 60 percent of the total African debt relief reported in Chinese official figures for 2000 to 2012. Based on these figures, 94 cases of debt cancellation and 18 debt restructuring cases in Africa were reported. There is a total documented debt cancellation valued at about $2.2 billion. Most cases of debt cancellation were in 2001and 2006, and two-thirds of the debt cancellation cases were from 2000 to 2007. Zambia, Cameroon, Comoros, Ghana, Mali, Mozambique and Sudan are recorded as having more cases of debt cancellation than other countries.

Since the pandemic, China's debt relief has fallen into four distinct categories: (1) official bilateral creditor debt relief, as part of the G20 effort, which is more than $1.3 billion to 23 countries worldwide (16 of which are African countries); (2) under the FOCAC program, continued cancellation of interest-free loans to 15 African countries that matured in 2020; (3) ad-hoc debt relief provided by Chinese commercial banks such as the China Development Bank (CDB) and the Industrial and Commercial Bank of China (ICBC); and (4) $8 million contributions to the IMF's Catastrophe Containment and Relief Trust.

Source: Acker, K., Bräutigam, D. and Huang, Y. 2020.

Therefore, we propose the following policies be considered:

- Reform the DSA frameworks to include public assets, creating metrics such as the bottleneck exercise to scrutinize new debt in developing countries. The goal would be to ensure that such debt is invested in public assets that enhance long-run growth rather than short term speculative finance,
- In development finance, focus on equity as well as debt. Recognize that in some cases restructuring will still be inevitable and will require innovative approaches such as debt-for-equity and debt-for-nature swaps. We say more about these approaches below.

    1) *Debt-to-bond swaps*. The Brady bond type of transactions, in particular, can be structured for today's distressed debt resolutions specifically pertaining to China's loans to developing countries with modifications. Economists argue that 1990s general principles such as granting debt relief in exchange for greater assurance of collectability, linking debt relief with economic policy reforms, and making the resulting debt highly tradable, should still be applied in today's market conditions. Efforts are to be made together by the creditor and debtor countries, as well as in cooperation with multilateral institutions (Qian and Wang 2022).

    2) *Debt-to-green equity swaps and debt-to-nature swaps.* There is now over thirty years' experience with debt-for-nature swaps whereby countries in debt distress agree to invest a certain percentage of debt relief into natural assets. This can be applied not only to the heavily indebted countries, but to those of high risk as well. For countries that are not heavily indebted but have reduced fiscal space due to COVID-19,

debt to green equity swaps and debt-to-nature swaps would facilitate raising climate ambitions in the form of additional actions or investments in climate adaptation or mitigation. Moreover, this could be complemented by an incentive scheme for issuing new sustainability-aligned sovereign debt.[9]

3) *Innovative asset-based refinancing.* First, from the development finance perspective, African countries may consider borrowing less through the international bond market but rather trying to attract more equity investment (FDI), using Special Economic Zones or green corridors,[10] thereby enhancing their export capacity. Second, innovative green financing and refinancing may be designed based on already completed projects that are already a part of public assets.

- Completed projects constituting a part of public assets, can, if professionally managed, generate revenue, employment and spillover effects.

- If a country's government has repaid part, say 30 percent, of the loans for a completed project that is in operation, that project constitutes the government's equity in the public sector balance sheet. The government could add up several of these projects' equity shares (e.g., e1, e2 and e3), package them and ask for refinancing from Sovereign Wealth Funds, green funds, or multilateral, regional or national development banks and other long-term "patient" investors.

- Financial institutions should welcome opportunities to combine a loan "in distress" with a well-designed green energy/corridor project and provide asset+ based refinancing at a preferential interest rate, because it will add value to their effort in the overall goal of decarbonization. Here the experience of CDB with the Wuhu model may be applicable (see Lin and Wang 2017b on the Wuhu model). The reasoning is that, with urbanization and agglomeration, projects that are consistent with a country's comparative advantage would have spillover effects on such other sectors as real estate, construction and trade and services, and would promote growth and revenue generation. With prices and productivity rising, shifting from a single loan to a packaged portfolio may achieve "One plus one greater than two" over a longer time horizon.

- In the long term, a country may take completed projects already in operation with cash flows (e.g., a power generation plant or a railway) up for IPOs, divesting and diversifying from these completed projects and raising capital for other public infrastructural investment. That country might allocate a certain proportion of these shares to the country's public wealth funds (PWF), sovereign wealth funds (SWF) or national pension funds, so that all citizens could benefit. Examples include China's profitable high-speed rails from Beijing to Shanghai (and five other lines) which the government put up for IPOs, raising funds in the stock exchanges. In general, China's regulation requires that certain proportions of shares of state-owned listed companies be given to the National Social Security Funds/pension funds so that everyone can benefit from them, similar to Singapore's GIC

[9] Some have proposed adopting the Brady-type credit enhancement in exchange for a commitment to Paris-aligned Nationally Determined Contributions (NDCs) and to dedicate receipts to SDG-linked spending items, to be observed by the same monitoring mechanism as in the case of the restructured debt (Volz et al. 2020). In particular, for some middle-income countries, debt-for-climate swaps can help fund the energy transition, in exchange for accelerated coal closures and a shift to renewables (Simmons et al 2021). Viable options include taking the equity out of coal plants to refinance into clean energy and social adjustment (Bodnar et al. 2021).

[10] Green corridor projects should incorporate investment in soft health/vaccination infrastructure, eco-friendly tourism, green energy and hard infrastructure for sustainable development.

and Temasek) African countries can learn from these experiences of public asset management (see Box 3.1).

In general, a country whose public assets are more significant versus their liabilities is in a better position than a conventional DSA would suggest. That country could refinance public assets based on its equity share thus far to take on more debt. It might also decide to sell those public assets to pay down debts when public revenues are on a decline. The country can select from various potential buyers, such as SWFs, if they decide to do so.

We turn now to look again at issues and policies related to China's engagement in Africa's development. We note that targeted investment is needed to address African countries' bottlenecks. In the eigth FOCAC meeting in 2021, China committed to donating 10 billion vaccines to Africa, meeting that region's urgent needs. China will encourage its businesses to invest no less than $10 billion in Africa in the next three years, and will establish a platform for China-Africa private investment promotion. Also, China is ready to channel to African countries an additional $10 billion from its share of the IMF's new allocation of Special Drawing Rights.[11] Evidence has shown that there is still much room for improvement for program design. Targeting problems afflicted 22 percent of completed hard-infrastructure projects and 26 percent of soft-infrastructure projects, meaning that they were not genuinely demand-driven. Development cooperation must necessarily be demand-driven, addressing each country's specific needs.

We reiterate too that innovation is needed for both debt relief and green transformation. China has committed not to build any coal-fired power plants overseas, marking the beginning of its green transformation. In order to create such a virtuous cycle, creditor countries, including China, should utilize "tailored solutions" in the "debt distressed" countries. China, in particular, needs to enhance transparency and accountability. Part of that process would entail expediting the process of enacting a foreign aid law, while continuing to coordinate with the G20, the IMF and the Paris Club, and to follow international rules of the game (Sanderson and Forsythe 2013; Lin and Wang 2017).

In fact, China has already revealed its willingness for cooperation in this field, which can be seen in its Seven-Point Proposition to Upgrade China-Africa Cooperation[12]. In that document, China commits to stepping up multilateral cooperation with the continent in the field of health, industrial capacity building, regional connectivity enhancement, agriculture, digitalization and the environment.

China and other bilateral lenders need to work together to design tailored restructuring plans to help the African countries in easing their debt burden and expand fiscal space for a sustainable economic recovery (Qian and Wang 2022). Christine Lagarde, President of the European Central Bank, recently said, "As the pandemic passes, we need to shift focus from preserving the economy to transforming it. To do that, we must redirect investment towards the green and digital sectors."[13] We echo her view. In pursuit of achieving sustainable development goals in the post-pandemic era, African countries need to know what the government owns (assets) and owes (liabilities), to distinguish "patient capital" from "footloose" investors, and to separate long term (structural) and short term (liquidity) issues. In order to address the long-term structural issues, African countries need to work with patient capital holders such as MDBs and regional and national development banks by experimenting with innovative asset+ based refinancing and other approaches suggested in this paper.

[11] FOCAC, Keynote speech by Chinese President Xi Jinping at opening ceremony of 8th FOCAC ministerial conference. Available at: http://www.focac.org/eng/gdtp/202112/t20211202_10461080.htm.

[12] State Councilor and Foreign Minister Wang Yi, at a joint press availability with Tanzanian Foreign Minister Palamagamba Kabudi in Chato on 8 January 2021.

[13] Christine Lagarde, President of the European Central Bank. In a speech at the Brussels Economic Forum, June 30, 2021.

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Annex 1 China: National Balance Sheet, by Sector, 2019

2019, as % of GDP	Households		Non-financial sector		Financial sector		Government		Domestic		Foreign		Total	
	Asset	liability	Asset	liability	Asset	liability	Asset	liability	Asset	liability	Asset	liability	Asset	liability
Nonfinancial assets	253%		347%		3%		68%		671%				671%	671%
1. Fixed assets	253%		178%		2%		21%		454%				454%	454%
2. Inventory			121%				1%		122%				122%	122%
3. Other nonfinancial assets			48%		2%		45%		95%				95%	95%
Financial assets and liabilities	329%	63%	99%	445%	443%	447%	136%	49%	1007%	994%	40%	54%	1047%	1047%
1. Currency	6%		1%		1%	8%			8%	8%			8%	8%
2. Deposits	114%		63%		20%	231%	34%		231%	231%	3%	3%	234%	234%
3. Loans	1%	63%		120%	185%				186%	183%	6%	9%	192%	192%
4. Bank Acceptance Bill not yet discounted			3%	3%					3%	3%			3%	3%
5. Insurance	13%		6%			19%			19%	19%			19%	19%
6. Transactions between financial institutions					12%	12%			12%	12%			12%	12%
7. Reserves					24%	24%			24%	24%			24%	24%
8. Bonds	3%			24%	84%	84%	1%	38%	89%	91%	4%	2%	93%	93%
9. Equity Stocks	173%		6%	273%	34%	34%	86%		299%	302%	6%	3%	305%	305%
10. Shares in Security and investment funds	20%		3%		50%	50%	10%		82%	82%			82%	82%
11. Central bank loans					12%	12%			12%	12%			12%	12%
12. Other				5%			5%		5%	5%			5%	5%
13. Direct investment			15%	21%					15%	21%	21%	15%	36%	36%
14. International reserve assets					22%	22%			22%			22%	22%	22%
Net worth		**520%**						**165%**		**685%**		**-14%**		**671%**
Total Assets and Liabilities and net worth	583%	583%	445%	445%	447%	447%	204%	204%	1678%	1678%	40%	40%	1718%	1718%

Source: Annex to the "*China National Balance Sheet, 2000-2019*" (in Chinese), 2020, National Institution for Finance & Development, Chinese Academy of Social Sciences.

Note: China's GDP in 2019 was $14.28 trillion.

Annex 2 Hard Infrastructure Projects in Africa Financed and Completed by China: 50 Largest Projects by Dollar Amount

Project Title	Sector	Recipient Country	Year Completed
China Eximbank provides $2.003 billion buyer's credit loan for Phase 1 of Standard Gauge Railway Project	Transport	Kenya	2017
China Eximbank provides $1.098 billion USD buyer's credit loan for Khartoum-Port Sudan Railway Construction Project	Transport	Sudan	2014
China Eximbank provides $1.6 billon preferential buyer's credit for Phase 1 of the Standard Gauge Railway Project	Transport	Kenya	2017
China Eximbank loans 1.4 billion USD for Phase 2A of the Standard Gauge Railway Project	Transport	Kenya	2019
China Eximbank provides $608 million USD loan for 1250 MW Merowe Hydroelectric Power Plant Project	Energy	Sudan	2010
China Eximbank provides $1.2 billion loan for the Addis Ababa–Djibouti Railway Project	Transport	Ethiopia	2018
ICBC provides $825 million export credit facility for 600MW Morupule B Power Project	Energy	Botswana	2014
CMEC provides $551.5 million supplier's credit for Power Transmission Network Associated with the Imboulou Hydropower Plant Project	Energy	Congo	2012
China Eximbank provides $1 billion loan for Dolisie-Brazzavile Section of Pointe-Noire-Brazzaville Road (RN1) Construction Project	Transport	Congo	2015
China Eximbank provides $1.004 billion buyer's credit loan for 400kv Soyo-Kapary Power Transmission and Transformation Project	Energy	Angola	2017
CET and SGCC provide $1.002 billion supplier's credit for 500kV Power Transmission Line of the Great Ethiopian Renaissance Dam (GERD) Project	Energy	Ethiopia	2015
China Eximbank provides $981 million loan for the Addis Ababa–Djibouti Railway Project	Transport	Ethiopia	2018
China Development Bank provides $850 million loan for Western Corridor Gas Infrastructure Development Project	Energy	Ghana	2015
ICBC provides $837.47 million loan for 750MW Soyo I Combined Cycle Power Plant Construction Project	Energy	Angola	2017
China Eximbank provides $381.5 million USD seller's credit for Merowe Hydroelectric Dam Transmission Lines and Substations Project	Energy	Sudan	2009
China Eximbank provides $793.4 million USD preferential buyer's credit for Abidjan Autonomous Port Expansion and Modernization Project	Transport	Cote d'Ivoire	2020
China Eximbank provides $362 million loan for 1,344 km Benguela Railway Rehabilitation Project	Transport	Angola	2017
China Eximbank provided Mozambique $681.6 million buyer's credit loan for Maputo-Katembe Bridge Construction Project	Transport	Mozambique	2018
China Eximbank provides $690.7 million preferential buyer's credit for Thiès-Touba Toll Road Project	Transport	Senegal	2018

Project Title	Sector	Recipient Country	Year Completed
China Eximbank provides $429.71 million buyer's credit loan for Caxito-Nzeto Highway Rehabilitation Project	Transport	Angola	2016
China Eximbank provides $500 million preferential buyer's credit for Phase 1 (Abuja-Kaduna Section) of Nigerian Railway Modernization Project	Transport	Nigeria	2016
China Eximbank provides $541.6 million buyer's credit loan for Phase 1 of the Memve'ele Hydroelectric Power Plant Project in Cameroon	Energy	Cameroon	2016
CDB provides $531.8 million loan for Electrification and Home Connections Project in Luanda Province Project	Energy	Angola	2019
China Eximbank provides $524.6 million preferential buyer's credit for Phase 2 of Kribi Deep Sea Port Project	Transport	Cameroon	2018
CDB provides $400 million loan for Moçâmedes Railway Renovation Project	Transport	Angola	2012
China Eximbank provides $534.5 million preferential buyer's credit for Port Gentil-Omboue Road and Bridge Construction Project	Transport	Gabon	2020
China Eximbank provides $500 million preferential buyer's credit for Phase 1 of Abuja Light Rail Network Project	Transport	Nigeria	2018
ICBC provides $420.75 million buyer's credit loan for 1870MW Gilgel Gibe III Hydropower Project	Energy	Ethiopia	2016
China Eximbank provide $475 million loan for Addis Ababa Light Rail Project	Transport	Ethiopia	2015
CMEC provides $238 million supplier credit for 120MW Imboulou Hydropower Plant Project	Energy	Congo	2012
China Eximbank provides $509,433,034.27 buyer's credit loan for Package 5 of the N'Zeto-Soyo Highway Project	Transport	Angola	2017
China Eximbank provides $500 million USD preferential buyer's credit for 275MW Soubré Hydroelectric Dam Construction Project	Energy	Cote d'Ivoire	2017
China Eximbank provides $491.7 million buyer's credit loan for 100 km Ali Sabieh to Nagad Section of Addis Ababa–Djibouti Railway Project	Transport	Djibouti	2018
China Eximbank and Bank of China contribute $459 million to syndicated buyer's credit loan for EETC 500KV Transmission Lines Project	Energy	Egypt	2019
China Eximbank provides $482.57 million preferential buyer's credit for the 183MW Isimba Hydropower Station and the Isimba-Bujagali Interconnection Project in Uganda	Energy	Uganda	2019
China Eximbank provides $292 million buyer's credit loan for Bui Dam Construction Project	Energy	Ghana	2016
China Eximbank provides $349 million preferential buyer's credit for Addis Ababa-Adama Expressway Project	Transport	Ethiopia	2014
China Eximbank provides $423 million preferential buyer's credit for Phase 1 of Kribi Deep Sea Port Project	Transport	Cameroon	2014
China Eximbank provides $315 million loan for 360MW Kariba North Bank Hydropower Plant Expansion Project	Energy	Zambia	2014
China Eximbank provides RMB 2.1 billion government concessional loan for Bui Dam Construction Project	Energy	Ghana	2016
China Eximbank provides $300 million preferential buyer's credit for 160MW Grand Poubara Hydroelectric Dam Construction Project	Energy	Gabon	2014

Project Title	Sector	Recipient Country	Year Completed
China Eximbank provides $400.1 million loan for 55 km Blaise Diagne International Airport (AIBD)-Thiès-Mbour Project	Transport	Senegal	2019
China Eximbank loans 382.5 million USD for Drilling Services And Material for 80 Geothermal Wells at Olkaria Geothermal Project	Energy	Kenya	2016
China Eximbank provides RMB 2 billion government concessional loan for Phase 1 of Autonomous Port of Nouakchott Expansion Project	Transport	Mauritania	2014
China Eximbank provides $360 million preferential buyer's credit for 150MW Zongo II Hydroelectric Dam Construction and a 220 kV Transmission Line Project	Energy	Democratic Republic of the Congo	2018
China Eximbank provides $200 million preferential buyer's credit for NigComSat-1 Communications Satellite Project	Telecom	Nigeria	2007
China Eximbank provides $350 million preferential buyer's credit for Entebbe-Kampala Toll Road Construction Project in Uganda	Transport	Uganda	2018
China Eximbank provides $190.5 million buyer's credit loan for 357 km Quifangondo-Caxito-Uige-Negage Highway Rehabilitation Project	Transport	Angola	2008
China Eximbank provides $295.9 million loan for 254MW Genale Dawa III Hydroelectric Power Station Project	Energy	Ethiopia	2020
CDB provides $340 million loan for 400 KM Laúca-Huambo Power Transmission Line Project	Energy	Angola	2019

Source: The Global Chinese Development Finance Dataset, version 2.0 developed by Aiddata.
Note: We used AidData 2.0 and controlled for 3,126 completed and "Recommended For Aggregates" projects in Africa. We ended up with 468 projects located in five sectors for hard infrastructure. This table contains only the 50 largest and completed projects due to space limitations.

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