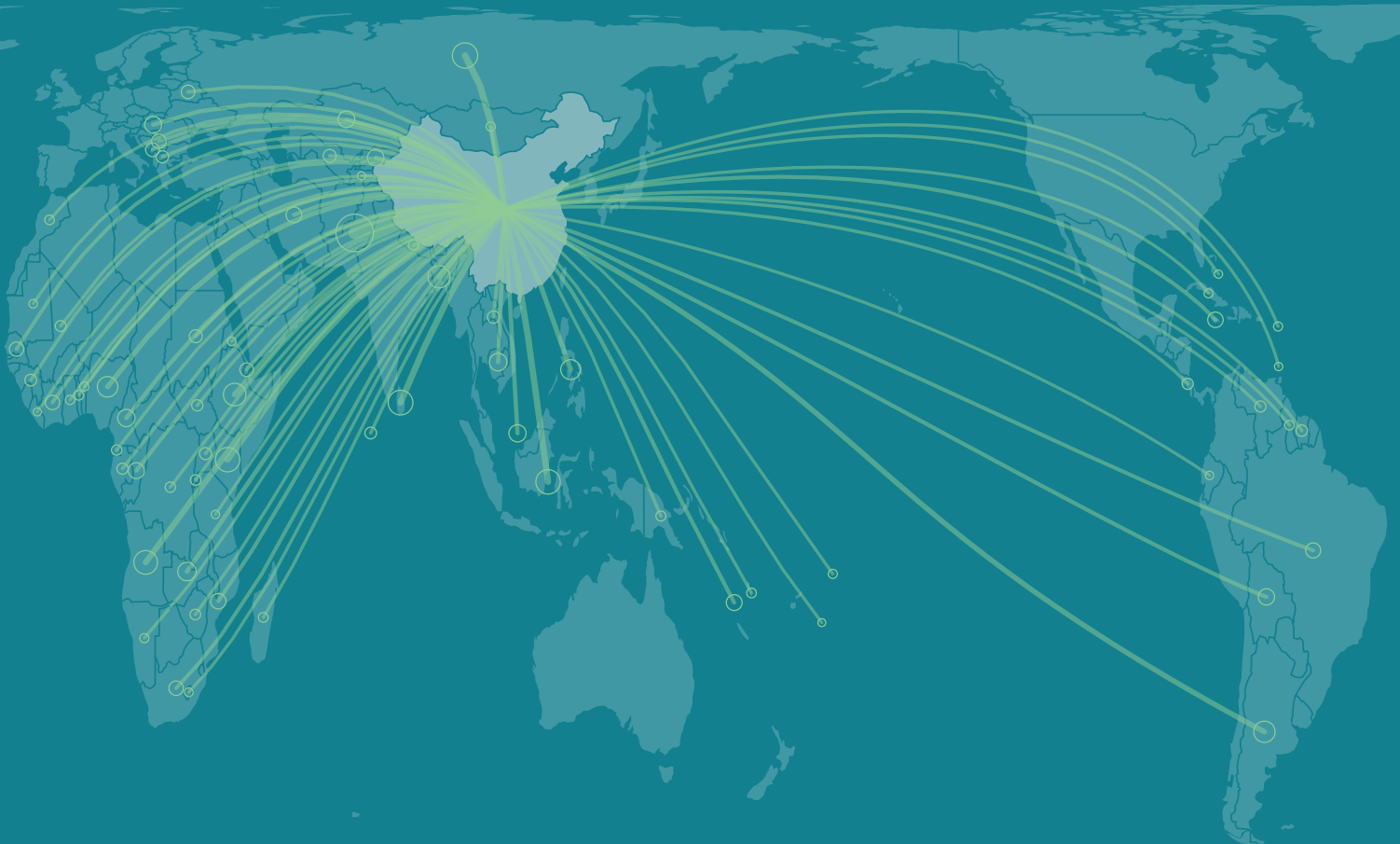


China's Overseas Lending for Transport Projects

Successes, Challenges, and
Recommendations



October 2021

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People-Oriented Cities

People-Oriented Cities is an advocacy and technical assistance organization that works to enhance sustainability, livability, and equity in cities, with a focus on transportation, strategic land use, and economic development.

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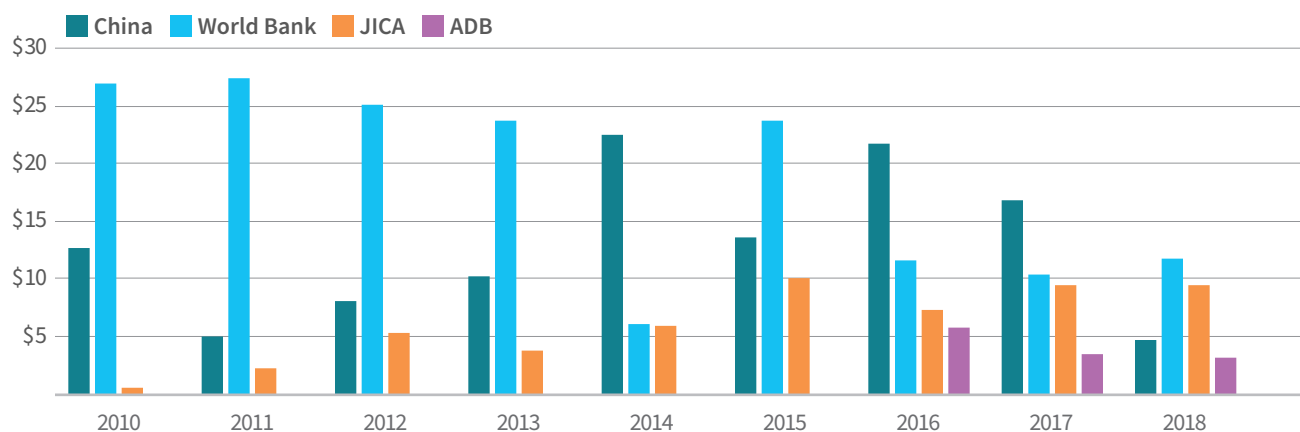
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Executive Summary

Figure 1. Annual Development Lending for Transport, Major Lenders, 2010 – 2018 (US\$ billions)



Between 2010 until 2020, China transformed from the single largest borrower of development loans for transport to a supplier of transport development loans second only to the World Bank. China became the pre-eminent source of intercity rail and intercity road loans, and an increasingly important lender for urban roads and urban rail transport. The impact of this lending is so large that whether the cities of the Global South grow towards sustainability or towards a permanent and damaging dependence on private motor vehicles depends in part on how China decides to wield this new-found influence.

This study reviews China's overseas transportation lending from the perspective of best practice in sustainable transportation. It then proposes recommendations for better aligning this lending with best practice.

China is not a party to the international agreements that help to ensure that overseas financing is executed in a transparent, socially, and environmentally-friendly manner. Instead, China's export credit is governed by its own internal policies. This has undermined the effectiveness of the international agreements governing export credit.

In the wake of the Covid-19 pandemic, because of the size of China's role as a lender, China has emerged as the major creditor for many countries. China, however, is not a

member of the Paris Club that traditionally manages debt negotiations. Lack of transparency about the level and terms of Chinese lending has complicated the ability of the IMF to manage developing country debt.

China has been very successful in several areas that other countries, in their overseas transport financing, have not. Chinese-financed projects have been completed remarkably quickly and with very low construction costs. China has also demonstrated a willingness to invest in projects with a long time horizon, such as a pan-African rail network.

Some challenges have emerged, however. Most critically, the scale of Chinese lending, sometimes for projects with weak economic and financial returns, has worsened the indebtedness of numerous countries, some of them critically. Large scale megaproject financing has crowded out more sustainable investments that would have accomplished more for less. Weaker environmental and social due diligence has made China a lender of last resort for projects with significant environmental and social externalities. Lack of transparency has raised concerns among civil society that the public interest is being sacrificed for private gain. Finally, the extensive use of Chinese labor has contributed to low cost, high-speed project delivery, sometimes embittering the local labor-force.

High profile projects, particularly in East Africa, illustrate these points. Ethiopia and Kenya have both fallen into debt in large measure due to Chinese railroad and highway loans, needlessly designed on new alignments, with weak economic and financial returns. Overbuilt intercity rail terminals sit empty on the distant outskirts of cities, far from where people need to go. Light rail systems have been funded where bus rapid transit would have done more for less. Urban roads have been redesigned as highways where they currently function as urban arterials, leading to dangerous conditions for pedestrians and cyclists, and limiting benefits for transit.

The following eight recommendations could help Chinese export credit agencies move forward:

- 1 Help debtor countries grow out of their debt:** The current Covid-19 related debt crisis is a chance for China to show their commitment to helping countries grow out of debt rather than hoping that austerity will ensure their banks get repaid.
- 2 Fully assess economic and financial impacts of transport projects:** Chinese export credit agencies should more carefully assess the likely financial and economic impacts of their loans to ensure that the current problems with debt repayment do not recur.
- 3 Perform an alternatives analysis and fund the option with the best return on investment:** Chinese megaprojects have crowded out investments that would have done more for less. A more careful appraisal of lower cost, higher impact alternatives should be required before a loan moves forward. These include:
 - Upgrade roads and/or railways on existing alignments before building on new alignments
 - Build more bus rapid transit and less light- and heavy rail.
 - Build urban roads with amenities for public transit, cyclists, and pedestrians
- 4 Coordinate better with other international donors:** China's ECAs should follow best practice international competitive bidding and procurement procedures, respect and participate in country-level debt caps, harmonize procedures for environmental and social due-diligence, and follow the same transparency guidelines as the MDBs and other ECAs.

- 5 Improve labor conditions and labor relations**
- 6 Increase in-house capacity to lead rather than follow project development**
- 7 Assist borrowers with resettlement following best practice**
- 8 Use project financing to promote Chinese best practices:** China has some of the best BRTs, waterfronts, bikeways, metros, public spaces, and other transportation amenities in the world and can build them fast and well. China could do more to promote loans in these more sustainable areas. China also has high functioning municipalities and could do more to build the municipal capacity of their borrowers.

The scale of China's transport lending to the Global South is so large that if directed responsibly to sustainable transport projects, it could be transformative. If mis-directed, however, it could ensnare developing countries into unsustainable levels of debt, as well as lock the rapidly growing cities of the Global South into motor-vehicle domination that diminishes the safety of residents and threatens the sustainability of the planet.

Acronyms

AACRA: Addis Ababa City Road Authority

ADB: Asian Development Bank

AFD: Agence Francaise de Development

AfDB: African Development Bank

AIIB: Asian Infrastructure Investment Bank

BRI: Belt and Road Initiative

BRT: Bus Rapid Transit

BSTDB: Black Sea Trade and Development Bank

CARI: China-Africa Research Institute of the Johns Hopkins School of Advanced International Studies

CRBC: China Road and Bridge Corporation

CREC: China Railway Engineering Company

CRRC: China's Rail Rollingstock Corporation

CSR: China South Locomotive and Rolling Stock Corporation, later acquired by CRRC

CDB: Chinese Development Bank

CHEXIM: Import Export Bank of China

DSSI: Debt Service Suspension Initiative

EBRD: European Bank for Reconstruction and Development

ECA: Export Credit Agency

EIB: European Investment Bank

ERC: Ethiopian Railway Corporation

ESIA: Environmental and Social Impact Assessment

EU: European Union

G7: Group of 7 Countries (Canada, France, Germany, Italy, Japan, the United Kingdom, the United States)

G20 FMCBG: The G20 Finance Ministers and Central Bank Governors

GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH

HDM: Highway Development and Management Model

ICB: International Competitive Bidding

ICBC: Industrial and Commercial Bank of China

IDB: Inter-American Development Bank

IMF: International Monetary Fund

JICA: Japan International Cooperation Agency

KfW: Kreditanstalt für Wiederaufbau (German ECA)

LRT: Light Rail Transit

MDB: Multilateral Development Bank

MRT: Metro Rail Transport

NGO: Non-Governmental Organization

NMT: Non-Motorized Transport

NCIP: Northern Corridor Integration Project

OECD: Organisation for Economic Co-operation and Development

O&M: Operate and Maintain

PFR: Program for Results loan

PPP: Public Private Partnership

PPHPD: Passengers per Hour in the Peak Direction

SGR: Standard Gauge Railway

SZMC: Shenzhen Metro Corporation

WB: World Bank

WTO: World Trade Organization

Introduction

In the 2010s, The People's Republic of China emerged as the largest international source of below-market rate loans for transportation infrastructure and rolling stock to developing countries. Late in the decade, many borrowers found themselves increasingly in debt, a problem significantly worsened by the Covid-19 pandemic. Since then, China's lending has slowed significantly.

China's foreign investments into infrastructure have been branded by China as the Belt and Road Initiative (BRI). The brand suggests an effort to recreate the Silk Road that in ancient China provided the key trade route between China and Europe. The BRI is mostly an aggregation of national-level investments, many of which predate the creation of the BRI.

While much has been written about the BRI from the perspective of the environment and human rights, this report uniquely focuses on the BRI's transportation investments from the perspective of best practice in the sustainable transportation field.

China's rise as the major lender for transport projects

Since World War II and until the 2010s, the main institutions providing concessional financing for transport projects in the developing world were the multilateral development banks (MDBs) – most notably the World Bank, the Asian Development Bank (ADB), the African Development Bank (AfDB), and the Inter-American Development Bank (IDB). These institutions are heavily influenced by the United States and, to a lesser extent, Japan, European countries, Canada, and Australia.

The other major forces in concessional financing are the export credit agencies (ECAs). Of the national ECAs, Japan's JICA was the most important lender to the transport sector. All of these institutions remain active in overseas financing for transport projects.

The rapid emergence of China's ECAs as the dominant players in transportation lending is historically unprecedented. Even into the 2010s, China was the largest consumer of World Bank loans, but by the latter half of the 2010s the BRI made China the single largest source of international concessional lending in the transport sector, surpassing even the World Bank. In the early part of the 2010s, most of these loans came from China's 'policy' banks, such as the Chinese Export Import Bank (CHEXIM) or the Chinese Development Bank (CDB). As the decade progressed, China began to rely more heavily on the Asian Infrastructure Investment Bank (AIIB), an MDB that China created, and its commercial-oriented state banks (e.g., Bank of China).

To some extent, China's emergence as the prominent source of international credit for transport is due simply to China's rise as a source of concessional lending more generally. However, it also reflects China's greater focus on infrastructure, compared to the MDBs which have increasingly focused on social sectors such as health.

China's growing role in financing transport infrastructure in developing countries has put competitive pressure on the United States and the Group of 7 (G-7) to invest more into

transport infrastructure.¹ After decades of scaling down involvement in infrastructure in developing countries, in June of 2021, President Biden, together with the G-7, announced a new initiative known as Build Back Better World, or B3W; an explicit response to China's BRI.² This sudden burst of globalist rhetoric from the new US Administration is rightly viewed with skepticism from commentators, but it nonetheless demonstrates the degree to which China has reshaped the landscape for transport lending in developing countries.

China's economy is different from that of most of the countries that have dominated transport development financing in the past. China's dominant companies are mostly state enterprises. China's commercial banks are also state-owned. This higher level of state involvement has led to a higher risk tolerance; a willingness to make longer-term bets; and a greater risk of political influence behind investment decisions. It also makes the Chinese state more of a political target for detractors.

What China is getting right

Chinese national and municipal governments have the capacity to execute high-quality transport projects quickly. As a result, China has competitive companies proficient at building buses and busways, bikes and bikeways, metro cars and metros, and locomotives and railways. When China finances these more sustainable modes of transport, Chinese companies stand to benefit. Indeed, China's investments into intercity rail have been the most serious investment into rail in developing countries in decades. This could have positive long-term economic and environmental consequences.

Over the last decade, China has proven that its export credit is capable of financing high-quality transport infrastructure abroad and building it quickly and cheaply. Often, Chinese projects have been completed when the projects financed by other institutions have languished for decades. Further, China has taken risks on projects where economic returns are unlikely in the near term. This is potentially a boon for developing countries. Developing countries now have another source of financing to turn to if they are willing to use Chinese companies and do not want to deal with the often-onerous requirements of the MDBs.

¹ H. French and D. Dollar, "How should the G7 respond to China's BRI?" *Brookings Podcast*, July 7, 2021. <https://www.brookings.edu/podcast-episode/how-should-the-g-7-respond-to-chinas-bri/>

² S. Holland and G. Faulconbridge, "G7 Rivals China with Grand Infrastructure Plan" *Reuters*, June 13, 2021. <https://www.reuters.com/world/g7-counter-chinas-belt-road-with-infrastructure-project-senior-us-official-2021-06-12/>

“Developing countries now have another source of financing to turn to if they want to avoid the onerous requirements of the MDBs.”

Of course, China is also emerging as a major competitor in the auto industry, and it is also competing to fund more auto-oriented transport investments. Therefore, Chinese export credit, paired with Chinese companies, will play a role whether a country chooses to build a sustainable and equitable transportation system or a highway through the center of a major city.

Cities in the developing world are growing rapidly. Whether they grow into sprawling car-oriented cities or people-oriented cities, will be heavily influenced by the role that China chooses to play. While decisions primarily rest with the governments of developing countries, it is important for the survival of the planet that China become a partner in the long-term sustainability of these emerging transportation systems.

Chinese transport lending and its pitfalls

Chinese lenders have also made some missteps. Many of these missteps are also being made by the MDBs and other ECAs. The problems that have emerged, both for the borrowers and for China, can be summarized as:

- **Worsening debt:** China's lending has worsened the debt problems for a number of poor countries by financing projects with dubious economic and financial benefits. This debt burden threatens growth in some of the poorest countries, while leaving China heavily financially exposed to bad debt.
- **Megaprojects instead of sustainable transport:** China's lending priorities were too focused on megaprojects that crowded out smaller, human-scale interventions which could have done more for less, while still benefiting Chinese companies.
- **Non-transparent procurement:** China's lending procedures are less transparent, and procurement less closely follows best practice, compared to the MDBs

“China itself has been damaged by the debt crisis that was exacerbated by insufficient economic and financial due diligence over its lending.”

and other export credit institutions. This has raised suspicions about China’s motives and embroiled China in corruption scandals, hurting its reputation.

- **Environmental and social costs:** Some China-funded projects have damaging ecological, social, or cultural externalities.
- **Labor issues:** China-funded projects have used less local labor content, causing some local resentment.³

How Chinese lending is viewed from the outside

China’s overseas role has become heavily politicized internationally, and while some of the criticism could be constructive, other criticism has been disingenuous.

Suspicious about China’s motives behind the BRI have been intentionally overblown by politicians from developed countries who are trying to score political points with a base that is hostile to China as a result of economic competition. The US media, and some politicians have accused China of ‘debt-trap diplomacy,’ or intentionally trapping developing countries into debt in order to secure low-cost access to their natural resources.⁴ These concerns have been echoed uncritically by much of the American press and amplified by African media as well. In some African countries, China has become the subject of highly contentious political debate. The China-Africa Research

Institute (CARI), Chatham House⁵, and other watchdog groups have done a good job debunking many of the most serious accusations.

Other concerns, however, are genuine and are reviewed in Chapters 3 and 4. While these should be presented to the leaders of the countries that borrowed the money from China, as they bear ultimate responsibility, nonetheless China’s economy and reputation have suffered because of the poor outcomes of some of the projects it has financed. In particular, China itself has been damaged by the debt crisis that was clearly exacerbated by insufficient economic and financial due diligence over its lending.

China should aim to redirect its future transport sector lending away from costly megaprojects with poor economic and financial outcomes, towards more carefully targeted, more economically, financially, and environmentally sustainable transport investments. In doing so its partners would thrive, its trade with these countries would grow sustainably, its reputation would be considerably enhanced, and some of the threat of climate change would be mitigated.

³ F. Chiyemura, “Chinese firms – and African Labor – are Building Africa’s Infrastructure,” *Washington Post*, April 2, 2021. <https://www.washingtonpost.com/politics/2021/04/02/chinese-firms-african-labor-are-building-africas-infrastructure/>

⁴ “U.S.’s Pompeo Says China Has Brought Bad Deals and Lawlessness to Sri Lanka,” *Reuters*, Oct. 28, 2020. <https://www.reuters.com/article/usa-asia-sri-lanka/u-s-s-pompeo-says-china-has-brought-bad-deals-and-lawlessness-to-sri-lanka-idINL8N2HJ0QB>

⁵ Lee Jones and Shahar Hameiri, “Debunking the Myth of Debt-Trap Diplomacy,” *Chatham House*, August 19, 2020. <https://www.chathamhouse.org/2020/08/debunking-myth-debt-trap-diplomacy>

China's Role in Global Export Credit Governance

As Chinese export credit has such a powerful impact over infrastructure development in developing countries, it is important for transportation professionals and activists who are not expert in development finance to understand how and why China's ECAs are governed differently from other ECAs. This chapter provides a primer on China's role in export credit governance.

How export credit agencies differ from multilateral development banks

Most of China's support to transport projects outside of its borders is in the form of export credit provided by two 'policy' banks: the Chinese Export Import Bank (CHEXIM) and the Chinese Development Bank (CDB). Policy banks are banks capitalized with government resources to pursue the economic policy of a given country. CHEXIM is an ECA, while the CDB is a development bank.⁶ In most ways, the two banks are similar, but the CDB does not give loans at interest rates significantly below commercial interest rates, and the CDB also lends money for projects inside China. In other ways, the CDB functions as an ECA and will be treated as such in this report.

Export credit is generally a loan provided by a government to another government to help finance the purchase of products and services primarily from the lending-countries' companies. The interest rates are generally below what would be provided by a commercial bank, making the use of that country's companies more attractive. Almost all developed countries have ECAs, and even some emerging economies have them. At last count there were about 48 countries with an ECA. As such, ECAs are primarily commercial institutions that exist to support the competitiveness of their own country's companies vis-à-vis other countries.

While most countries do not formally tie most of their export credit to purchases from companies from their own country, in practice the lending country's firms tend to win most of the contracts.

Multilateral Development Banks (MDBs), by contrast, have a broader development mandate, such as poverty reduction, environmental sustainability, and social justice. MDBs cannot tie loans to a particular country's contractors: the loans must be spent on goods and services that are subjected to internationally competitive bidding (ICB) among firms from all the bank's member states. One advantage of routing a project's financing through an MDB is that it is sure to have gone through competitive tendering which tends to improve project outcomes.

MDBs also require that their loans be part of a development strategy and subjected to a higher level of environmental and social due diligence than ECAs. This helps direct their lending towards their development goals. This review is not only more rigorous than that required by export credit institutions, but also more rigorous than that required by the laws of most of their borrowing countries.

The ECAs and the MDBs try to harmonize the way they do business. While there is healthy competition among and between the ECAs and the MDBs, this competition can also be destructive. For instance, the European Investment Bank (EIB), which originally only made loans inside the European Union, previously only required the level of environmental and social review required by the laws of the borrowing country, and they were not staffed with personnel experienced in performing such a review. This became problematic when the EIB began to lend extensively outside of the EU to countries with weaker environmental standards and social safeguards. The result was that borrowing countries would tend to ask the EIB to lend money to those projects which they did not believe would survive a more rigorous environmental and social review. This led the other MDBs to complain that it gave the EIB an unfair competitive advantage, and since 2010, the EIB has in large measure harmonized its environmental and social review procedures with that of the other MDBs.

This review process generally improves the quality of a project's outcomes, but it can be time consuming, expensive, and bureaucratic, and many borrowing countries don't like it.

⁶ For a more detailed discussion, see J. Jin, X. Ma, and K. Gallaher, "China's Global Development Finance: A Guidance Note for Global Development Policy Center Databases," Database Coding Manual, Boston University Global Development Policy Center, 2018.

The same process occurs between the MDBs and the ECAs. If a borrowing country believes a project may be controversial and hard to finance through an MDB, it may turn to export credit to get around the MDBs more stringent environmental and social review process. Thus, the way in which the ECAs regulate themselves is growing more important. China's sudden emergence as the dominant supplier of export credit has fundamentally changed this regulatory regime.

China's role in export credit governance

Chinese export credit has grown to the point where in some years it is the single largest source of export credit for transport investments in the world, greater than the Group of 7 (G7) countries combined (US, UK, Japan, France, Germany, Canada, Italy), outpacing even the World Bank in some years.⁷

Just as the MDBs have tried to harmonize their lending procedures, the ECAs have also tried to harmonize their procedures, for similar reasons. China, however, is not a party to the international agreements governing export credit. Having the largest supplier of export credit operating outside the rules governing export credit in fact undermines the entire regulatory regime. This has drawn increased international scrutiny from governments with competing economic interests, from environmentalists, and other civil society organizations.

China and the OECD arrangements that govern export credit

Since the 1970's the largest ECAs have agreed to follow a common set of norms in order to avoid certain problems. These norms are embedded primarily in two intergovernmental agreements, governed by the Organisation for Economic Co-operation and Development (OECD): *The OECD Arrangement on Officially Supported Export Credits*⁸ and the *Recommendation of the Council on Common Approaches for Officially Supported Export Credits and Environmental and Social Due Diligence*.⁹

China, however, is not a member of the OECD and is not a party to these arrangements which govern the ECAs.¹⁰ The OECD has frequently been called a 'rich man's club,' as only the developed countries are members. As an emergent economic power, China has yet to join.

The main reason that countries agreed to a common set of rules for their ECAs was to avoid trade distortion. When a company is bidding for a major project in another country, it is common for the company to seek the support of its own government's export credit institution to make its bid more competitive. The cost of financing can often be the most important element in overall project cost.

National export credit institutions generally raise capital from bond markets and then lend it to companies from its own country. If the rate at which the credit is offered to the company bidding on the project is lower than what it cost the government credit institution to raise the capital, this is a subsidy that directly or indirectly will be paid by the country's taxpayers. The provision of subsidized export credit to support the competitiveness of companies from a given member state can provide an unfair competitive advantage, thus posing a threat to the trade regime, and indeed such a subsidy is a violation of the World Trade Organization (WTO).

While China is a member of the WTO, policing export credit is difficult, and the WTO does not have the capacity to do it in a timely manner. In the 1970s, the member states with the largest ECAs decided to use the more flexible negotiating apparatus of the OECD to regulate the export credit activities of their member states. All of the member states have a vested interest in keeping a boundary on the amount of financing subsidy that any member state can offer to its companies. Without such boundaries, there is a risk that for every major project, the borrowing country could play the competing firms and their state backers against each other, making the deals profitable for none. For this reason, all the OECD countries agreed to abide by a set of rules negotiated through the OECD, an organization of primarily industrialized countries.

The OECD Arrangement on Officially Supported Export Credits

The establishment of the OECD rules was led by the United States, which at the time the rules were established in the 1970s was an undisputed economic hegemonic power. The *OECD Arrangement on Officially Supported Export Credits* ("Arrangement") has evolved since 1978 to its latest iteration which was issued in 2016.

⁷ Hopewell, K. 2020. *Clash of Powers: US-China Rivalry in Global Trade Governance* (Vancouver: University of British Columbia), p.210. Transport specific figures are our own calculations based on data explained later in the text.

⁸ <https://www.oecd.org/trade/topics/export-credits/arrangement-and-sector-understandings/>

⁹ TAD/ECG/(2016)3 07/04/2016 RECOMMENDATION OF THE COUNCIL ON COMMON APPROACHES FOR OFFICIALLY SUPPORTED EXPORT CREDITS AND ENVIRONMENTAL AND SOCIAL DUE DILIGENCE (THE "COMMON APPROACHES"). [https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclang=en&cote=tad/ecg\(2016\)3](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclang=en&cote=tad/ecg(2016)3)

¹⁰ This material and that which follows is predominantly taken from Hopewell, K. 2020. *Clash of Powers: US-China Rivalry in Global Trade Governance* (Vancouver: University of British Columbia).

It provides sector-specific guidelines on the terms and conditions of export credit, and it also mandates transparency. The terms and conditions of pending deals must be made public prior to signing. Publication of the pending loan gives other member states the opportunity to match the terms and conditions being offered, and it also gives the general public information about what is being financed. The Arrangement is not a treaty, so the member states are not legally bound by it; however, it is widely accepted by member states as the rules of the game, and there have rarely been violations or disputes. The gradual tightening of the rules over time has tended to eliminate very large subsidies in export credit, where a national ECA offers one of its countries credit at a rate that is below what it can buy the capital in the international bond markets.

The specific provisions can be summarized as follows:

- **Minimum interest rate:** the interest rate on the lending country's government bonds + 1%.
- **Minimum risk premium on the loan:** the OECD establishes a common risk premium on the borrowing country that significantly affects the total interest rate.
- **Maximum loan repayment:** 10 years for developing countries, 14 years for rail projects
- **No grace period:** (years when no repayment is required)
- **Minimum down payment:** 15%, maximum loan for 85% of the contract value
- **Tied aid:** (the funds must be used by companies from the country providing the credit): not allowed for lower-middle income countries or wealthier countries

China, as a member of the WTO but not of the OECD, is bound by the general principle of not subsidizing export credit, but it is not bound by the OECD Arrangement. While theoretically, a case could be brought against China to the WTO for not following the rules of the OECD Arrangement, the enforcement regime at the WTO is extremely cumbersome (a case can take 5 years) and requires demonstration of systemic violations, which are very difficult to prove particularly since the information is not transparent.

However, international commentators suggest that China primarily undercuts OECD export credit institutions in the form of not charging the OECD-established risk premium on the loan (which could add as much as 6% to the interest rate) and offering longer repayment periods and grace periods than the maximum provision.

One of the major beneficiaries of these attractive financing packages is China's state-owned manufacturer of rail equipment, CRRC Corp, which is now the world's second

“With China's rise to dominance of export credit, the OECD Arrangement, which does not include China, is no longer meaningful.”

largest industrial company behind General Electric. Loans for rail equipment to Pakistan and Argentina, for instance, were given at rates that were well below commercial rates if the risk premium were included in the interest rate offered (both countries are high default risk countries), and their repayment period was much longer than that allowed in the OECD agreement.

In 2014 alone, China supplied \$58 billion in export credit, more than the entire G7 countries combined. With the rise of China as a supplier of export credit, the OECD Arrangement without China is no longer meaningful.

A country need not be a member of the OECD to be a party to a specific agreement, and there have been efforts to bring China into this Arrangement. An international working group (IWG) was formed to do just this, but the talks have yielded no agreement after a decade.

The borrowing countries don't have any interest in forcing China to follow this Arrangement's rules: after all, it would just make credit more cumbersome and expensive for them. For China, however, not following the OECD risk premium for indebted countries no doubt contributed to the scale of lending to countries at significant risk of default, and has no doubt contributed to the current debt crisis, which will be discussed in the next section.

Environmental and social due diligence for export credit

Loans from MDBs are subject to environmental and social review that is consistent not only with a particular nation-state's own laws, but also to with international best practice. Thanks, in large measure, to pressure from international environmental NGOs these safeguards have gradually tightened over time. Recipient country governments tend not to like them, as they place conditions on the borrower that go above and beyond what is required under their own laws. They can lead to extremely slow and bureaucratic loan approval procedures and elevated

project costs, to the point where governments are increasingly loath to bring projects requiring, for example, significant land acquisition, to an MDB.

Partly to avoid these project-specific requirements, the World Bank has shifted to providing an increasing number of ‘policy loans’ which go directly to national government budget support but where the specific end-use of the funds is not subject to MDB environmental and social safeguards.

The environmental and social safeguards of the ECAs, by contrast, are somewhat more lenient. As export credit nominally makes no loftier claims than to promote a country’s own exports, it is held to a lower standard with respect to environmental and social safeguards. Export credit’s environmental and social safeguards are governed by an addendum to the OECD Arrangement called the *Recommendation of the Council on Common Approaches for Officially Supported Export Credits and Environmental and Social Due Diligence* (“Common Approaches”), first signed in 2003, and modified multiple times since. As with the OECD Arrangement, as China is not a member of the OECD, it is also not bound by the “Common Approaches.”

As with the Arrangement, the Common Approaches is intended to avoid a problem where one country’s companies have an unfair competitive advantage because they are held to a lower standard of environmental and social safeguards than another. Without such an agreement, there is a risk that competitive pressure among ECAs could lead to a ‘race to the bottom’ in terms of the level of environmental and social scrutiny.

The Common Approaches is similar to the environmental and social safeguard policies of the MDBs in the following ways:

- **Larger, more sensitive projects subject to greater scrutiny:** Member states must screen all their projects to determine if they:
 - a) involve more than \$10 million (in Strategic Drawing Rights, but roughly the same as US\$)
 - b) pass through sensitive areas; or
 - c) are likely to involve human rights abuses.

If the project meets ‘c’, or both ‘a’ and ‘b’, it is subject to an Environmental and Social Impact Assessment (ESIA).

- **Clearer environmental and social appraisal methodology:** Any ESIA must be benchmarked against host country standards, against one or more relevant environmental and social safeguards guidelines published

by the World Bank or the regional MDBs, and against the World Bank Group standards for involuntary resettlement, indigenous peoples, and cultural property.

- **Exceptions allowed:** While the loan must comply with these benchmarked standards, unlike with MDB loans, in exceptional circumstances, a loan may proceed even if it deviates from these standards. However, the deviation from these standards must be explained and disclosed.

In addition, for specific projects likely to inflict severe environmental consequences, the OECD has been used to add additional standards. The Obama Administration tried to initiate a multilateral process to phase out all export credit for coal-fired power plants except for projects in the lowest income countries. These efforts were compromised by China’s unwillingness to participate.¹¹

China’s national guidelines for foreign lending

China’s below-market interest loans are currently governed primarily by China’s own internal guidelines.

While China has not agreed to be bound by the OECD agreements governing export credit, it nonetheless has indicated a growing desire to ensure its projects have positive environmental and social outcomes.¹²

The Chinese Ministry of Ecology and Environment, together with other Chinese ministries, have promulgated several guidance documents for overseas investments and lending. Some of these are general and some are specific to the BRI.

The “Guidelines for Environmental Protection in Foreign Investment and Cooperation”¹³ indicate a clear desire on the part of China’s national government to ensure that Chinese companies communicate well with affected communities in the countries they work in, and respect local rights and customs, particularly with respect to indigenous peoples.

¹¹ Hopewell, K. 2020. Op.cit. p.268.

¹² This section relies mostly on “Safeguarding People and the Environment in Chinese Investments, a Reference Guide for Advocates.” 2019 (2nd Edition) (Ashville, NC: Inclusive Development International)

¹³ Notice from the Ministry of Commerce and the Ministry of Environmental Protection on the Publication and Distribution of the “Guideline on Environmental Protection in Foreign Investment and Cooperation”. https://www.followingthemoney.org/wp-content/uploads/2017/03/2013_MOF-COM-MEP_Guideline-on-Environmental-Protection-in-Foreign-Investment-and-Cooperation_E.pdf

China's below-market interest loans are governed by China's own internal guidelines.”

There are other guidelines for the BRI, such as “Guidance on Promoting the Belt and Road”¹⁴, and “The Belt and Road Ecological and Environmental Cooperation Plan.”¹⁵ These two documents indicate that China, while abiding by local ecological and environmental laws, will also turn to its sector-specific industry associations to develop industry-specific guidelines.

While China has developed sector specific guidelines for numerous sectors, including hydro-electric power, mining, agriculture, and rubber, thus far there are no specific guidelines for the transport sector. This could perhaps be an opening to develop a wider dialog.

In addition, the ministers of finance of 27 partner recipient countries involved in the BRI, including China, signed an agreement called “Guiding Principles on Financing the Development of the Belt and Road.”¹⁶ The most salient guiding principle with respect to this paper is:

“We underscore the need to strengthen social and environmental impact assessment and risk management of projects, improve cooperation on energy conservation and environmental protection, fulfil social responsibilities, promote local employment and ensure sustainable economic and social development. We also need to take into account debt sustainability in mobilizing finance.” (Paragraph 14)¹⁷

Meanwhile, China's policy banks, CHEXIM and the CDB have their own guidelines. CHEXIM's guidelines on environmental and social review are brief, and their own appraisals are not public. Their public documents indicate that their loan appraisal process simply requires that the project must follow the environmental and social appraisal procedures of the host country, and if these are minimal then the procedures of China or international procedures should be used.

It appears to be the case that CHEXIM has some discretion to raise environmental or social concerns through its lending and to mandate that these be complied with. This creates the possibility for local environmental groups to reach out to China's policy banks to express project-specific concerns even if they are being ignored by the host government. As the criteria, rules, and loan agreements are not transparent, however, it is difficult to know the degree to which CHEXIM raises such concerns. Interviews from the field suggest that CHEXIM and the CDB have limited staff presence in the countries and limited staff focused on these matters.

The CDB also claims to have its own internal environmental and social review policies, but they are not published and appear to be minimal.

Both the CDB and CHEXIM also signed the “Guidelines for Establishing the Green Financial System”¹⁸ promulgated by the People's Bank of China in 2016, but this document is primarily about supporting the financing of environmentally-friendly solutions like sustainable energy, rather than stopping environmentally harmful projects.

The CDB and CHEXIM guidelines do not necessarily conform to the ministries' guidance documents and are generally less stringent. However, if there are problems with specific Chinese overseas projects, one recourse is to contact the Ministry of Ecology and Environment's Department of International Cooperation. These will be taken more seriously if deriving from the nationals of the borrowing country as China is naturally concerned about its bilateral relations.

China's domestic environmental and social review process

As China's ECAs will first reference the borrowing country's own laws and regulations, and second China's own domestic environmental review process, here we review the environmental and social review process for major transportation projects within China.

In China, transportation projects are generally covered by the environmental review laws and guidelines for construction more generally.¹⁹ Urban rail, urban road, urban

¹⁴ Framework Provisions, Ministry of Ecology and Environment, Peoples Republic of China. *Guidance on Promoting Green Belt and Road* http://english.mee.gov.cn/Resources/Policies/policies/Frameworkp1/201706/t20170628_416864.shtml

¹⁵ Framework Provisions, Ministry of Ecology and Environment, Peoples Republic of China. *Guidance on the Belt and Road Ecological and Environmental Cooperation Plan*, June 2017. http://english.mee.gov.cn/Resources/Policies/policies/Frameworkp1/201706/t20170628_416869.shtml

¹⁶ Guiding Principles on Financing the Belt and Road, June 12, 2020 Xinhua Silk Road Database <https://en.imsilkroad.com/p/314204.html>

¹⁷ *ibid.*

¹⁸ “The People's Bank of China issued the Guidelines for Establishing the Green Financial System,” Partnership for Action on the Green Economy, August 2016. <https://www.un-page.org/people%E2%80%99s-bank-china-is-sued-%E2%80%9Cguidelines-establishing-green-financial-system%E2%80%9D>

¹⁹ “Environmental Impact Assessment Law of the People's Republic of China”, Revised and issued by the Standing Committee of the National People's Congress, Dec 2018 <http://www.mee.gov.cn/ywgz/fgbz/fl/201901/>

bridges and tunnels, must all conform to the procedures set out in the laws. The laws essentially stipulate that the construction unit in charge of the project must prepare the environmental impact assessment, which is then reviewed by the ecological department of the level of government in charge of the project, which in most cases is the municipality. Most major transportation projects are financed at the municipal government level, largely through funds raised through the appreciation of land value on land owned by the municipality. As a result, the municipal departments of environment are largely in control of environmental review of major transportation projects. These procedures include some element of public participation in the review process.

Resettlement issues are also largely addressed at the municipal level by the housing security and real estate bureaus of the municipal government.

China's resettlement policy has been increasingly brought into line with developed country norms. Particularly after 2004, China has tightened its resettlement policies after a period of protesting from farmers.²⁰ Currently 2011 national guidelines are in force.²¹ These guidelines essentially delegate the responsibility for management of involuntary relocation to the municipal level other than procedurally. In all cases, every effort is made to bring those being resettled into a voluntary agreement. Compensation offered must be published and those affected have 30 days to agree.

In Guangzhou, for instance, if more than half of those being expropriated believe that the compensation scheme is not in line with the provisions of the regulations, the housing expropriation department shall organize a hearing attended by those being expropriated and public representatives and modify the scheme according to the hearing.²² If the expropriated person or the housing expropriation department has any objection to the appraisal result, it shall apply to the original real estate price appraisal institution for reexamination and appraisal within 10 days from the date of receiving the appraisal report. For the implementation of the expropriation, the housing expropriation department shall sign the expropriation compensation agreement with the persons being expropriated within the signing period specified in the expropriation compensa-

tion plan. If the expropriated person is not satisfied with the compensation decision, s/he can apply for administrative reconsideration or bring an administrative lawsuit according to law.

Some case studies of resettlement conflicts from urban transportation projects are available on the internet in the Chinese language press that give a sense of how resettlement issues are handled. In all cases, the department promoting the construction, the authority responsible for housing, and those affected with resettlement, were brought into a dialog, and usually compensation issues were settled based on independent appraisals, though occasionally it goes to the courts.²³ None of this is particularly different from the US. Among the development banks, China enjoys a relatively positive reputation for dealing with resettlement issues domestically, in comparison to other emerging economies.

The differences between China's resettlement rules and those of the World Bank are reviewed in detail in Shi, et. al. 2012, which concludes:

“the resettlement policy of WB pays more attention to resettlement planning, plenary consultation and participation, social conformity, the resettlement of the vulnerable group, impacts on the residents in host area, monitoring and evaluation...”²⁴

In summary, at least in the last two decades, China has taken environmental impact assessment and resettlement issues quite seriously domestically, in order to avoid social instability.

China and international handling of debt negotiations

Many of the countries receiving CHEXIM and CDB loans now face an unsustainable level of debt. How this debt is managed is critically important to the future of these debtor countries. The governance of this debt is reviewed below.

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t20190111_689247.shtml, and “Regulations on the Management of Environmental Protection of Construction Projects Issued by the State Council of the people's Republic of China,” August 2017 http://www.gov.cn/zhengce/content/2017-08/01/content_5215255.htm

²⁰ Shi Guoqing, Yu Qingnian, and Zhou Jian, “Resettlement in China”, *Water Resources Development and Management Series, Impact of Large Dams, a Global Assessment*, 2012. (London: Springer)

²¹ “Regulations on Expropriation and compensation of houses on state owned land Issued by the State Council of the people's Republic of China,” January, 2011. http://www.gov.cn/zwggk/2011-01/21/content_1790111.htm

²² “Measures for the implementation of housing expropriation and compensation on state owned land in Guangzhou Issued by Guangzhou Municipal People's government,” November 2014, http://www.gz.gov.cn/zfjgzy/gzsrzmzfbgt/zfx-gkml/bmwj/qtwj/content/post_4436339.html

²³ Forced demolition in Wusheng Road Station of Wuhan Metro Line <http://news.cnhubei.com/xw/wuhan/201701/t3771137.shtml>, Demolition coordination of liuliancun station of Shenzhen metro line 16. https://www.sohu.com/a/300265822_760335

²⁴ Shi, et.al., 2012. Op. cit. p. 12

The Paris Club, the IMF and structural adjustment

The current debt crisis is not the first debt crisis faced by many of the world's poorest countries. Before China's rise as a creditor nation, debt crises were primarily negotiated through the Paris Club. The Paris Club is an informal body that represents government finance officials from roughly the same countries that constitute the OECD. The Paris Club was set up to resolve debt held by developing country governments and private companies that is guaranteed by the member states of the Paris Club, inclusive of ECA debt.

The Paris Club works closely with the IMF. It relies on the IMF to administer its decisions. Often, as part of a settlement, the Paris Club will provide loans from the IMF and MDBs that, in essence, allows the borrower to pay off the sovereign debt at a lower interest rate. As such, Paris Club agreements tend to require that debt owed to the IMF and the World Bank be paid off first before the debt of any of the ECAs or any private debt.

In the past, Paris Club agreements have tended to involve the debtor nation signing an agreement with the IMF that commits the government to taking certain austerity measures. In response to the debt crisis of the 1980s, for instance, the IMF and the World Bank cut back on infrastructure lending and began lending for 'structural adjustment' – loans primarily aimed at reducing the country's debt. Rather than focusing on increasing taxation on the wealthy, structural adjustment tended to result in cutbacks of government programs that tended to help the poor, privatization of state enterprises, and other elements of what is known as the 'Washington Consensus.'²⁵

"Structural adjustment" lending precipitated a global protest movement targeting the IMF and the World Bank. Today, there is less consensus among economists and even among the IMF, that austerity is the best way to resolve a debt crisis, with more economists believing that it is better to grow an economy out of debt.

Covid-19 and the G20 Finance Ministers and Central Bank Governors (G20-FMCG)

In May of 2020, at the urging of the World Bank and IMF, a Debt Service Suspension Initiative (DSSI) was approved whereby debt payments from the poorest countries would be temporarily suspended to cope with the economic consequences of Covid-19. China was a party to this agree-

ment. This initiative suspended about \$5 billion in debt payment, and \$1.3 billion of this was the result of China's agreements.

The DSSI proved insufficient, however, as the pandemic continued and many countries, including a growing list of middle-income countries, found themselves ever deeper in debt.

China is not a party to the Paris Club, its state-dominated economy does not follow the Washington Consensus, and given the scale of its lending, it does not necessarily want the IMF and the MDBs leading the negotiations, nor having the MDB debt paid off before its own ECAs. China has thus insisted on a different negotiating body: the G20 Finance Ministers and Central Bank Governors (FMCG). China is also negotiating debt relief through bilateral negotiations, the proceedings of which are not transparent. China is also said to be trying to link debt relief to agreements that its debts will be paid first, pitting its interests directly against that of the Paris Club.

This conflict over whose debts are paid first is potentially quite destructive to the debtor nations. Washington is now fearful that if it grants debt relief, the money will simply be used to pay off Beijing's debt. Beijing fears that if it offers debt relief, the MDBs and the IMF – both dominated by the US and other western nations – will be repaid before China. Both sides will need to compromise for the sake of the long-term economic health of the borrowing countries.

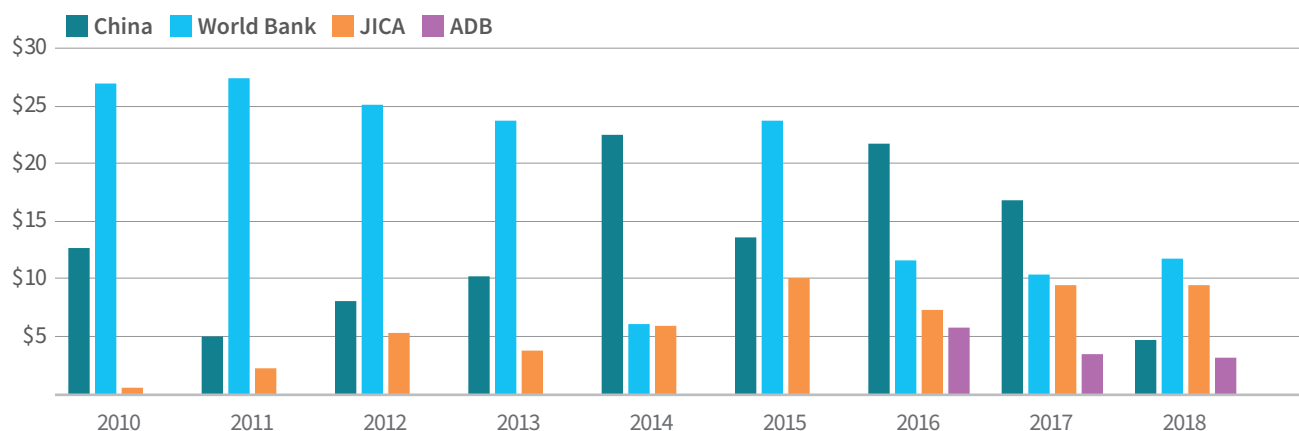
Another area of dispute is the issue of what constitutes a state export credit institution. The G20 FMCG is only negotiating the rescheduling of debt held by ECAs. China is arguing that the CDB is not a state ECA, but rather, a development bank, and therefore should not be covered by any agreement on debt rescheduling, while the Paris Club insists that the CDB is a state ECA and should be involved in the negotiations.

China's emergence as the largest creditor is thus likely to result in changes in how the Covid-related debt crisis will be addressed.

²⁵ https://en.wikipedia.org/wiki/Washington_Consensus

The Scale and Scope of China's Transport Sector Lending

Figure 1. Annual Development Lending for Transport, Major Lenders, 2010 – 2018 (US\$ billions)



In the mid-2010's, China's ECAs became the predominant lender for the transport sector globally. They were particularly predominant in select African and South Asian countries, and particularly in inter-city rail and national highways.

China's overall transport lending compared to other institutional lenders

From 2010-2018, Chinese below-market foreign transport sector loans totaled roughly \$106 billion, averaging around \$11.7 billion per year. Chinese concessional lending in the sector increased from 2010 until about 2016, then began falling sharply.

China is by no means the only country to lend money at concessional interest rates for transport projects. The US, for instance, uses the US Export Import Bank for transport projects, but it is almost entirely focused on supporting the sale of Boeing aircraft to emerging economies. European ECAs support Airbus in the same way. Outside of the airline industry, in the transportation sector, the most important sources of export credit are the Japanese International

Cooperation Agency (JICA), followed by France's AFD, Germany's KfW bank, and the Korean ECA. The Nordic ECA also plays a role in financing bus procurement, supporting Skania and Volvo. Since JICA is by far the largest, it is explored in greater depth here.

In the transport sector, these bilateral loans sometimes compete with, and sometimes complement, lending from the MDBs. Historically, export credit from a single country has been a relatively minor share of total funding for transport projects when compared to lending from the World Bank, the Asian Development Bank (ADB), the Inter-American Development Bank (IDB), the European Bank for Reconstruction and Development (EBRD), and the EIB.

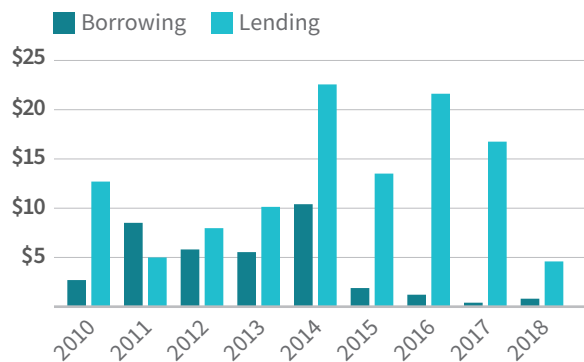
The total amounts of transport sector lending from Chinese ECAs, the World Bank, the ADB, and JICA provide a sense of the growing scale of Chinese lending activity in the sector.

Until 2010, China was primarily a borrower of capital from international financial institutions like the World Bank and the ADB. Between 2010 – 2018, however, there were three years when China's total bilateral transportation lending surpassed that of the World Bank. It also surpassed the lending of JICA in all years except 2018 and it surpassed lending for the ADB in all years for which data was comparable. From 2010 to 2018, total Chinese foreign transportation sector concessional lending averaged around \$11.7

billion per year, while the World Bank in the same period lent roughly \$14 billion per year, the ADB around \$6.5 billion, and JICA around \$6 billion per year.¹

The transition of China from a borrower of transport investment funds from the World Bank to a lender of transport funds can be seen in the figure below. The clear turning point was in 2014, when China's borrowing from the World Bank dropped sharply to marginal levels while its lending increased sharply.

Figure 2. China's transport sector borrowing from the World Bank compared to its transport sector lending (US\$ billions)

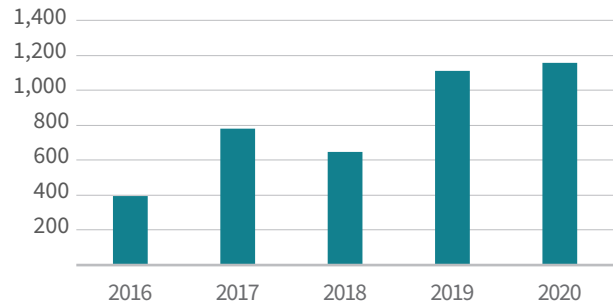


Rise of the Asian Infrastructure Investment Bank (AIIB)

As China's economic power grew, it tried to increase its membership share of the ADB. The ADB Board of Directors, dominated by the United States and Japan, balked. Unable to expand its influence at the ADB, China created a new MDB, the AIIB. The AIIB is a development bank that functions following roughly similar rules to the other MDBs and is staffed with many former World Bank staff. Voting rights for AIIB member countries are divided as follows: China: 25%, India: 8%, Russia: 6%. The rest of the votes are distributed among Asian and European governments. The Board does not include the US or Japan. China, as the largest shareholder, has a great deal of influence over the bank.

As lending from Chinese ECAs has fallen since 2016, lending from the AIIB has been increasing rapidly and steadily since its inception in 2016. The increase in AIIB lending, however, is not on the same scale as the drop in lending from the export credit banks.

Figure 3. Total AIIB transport sector lending 2010 – 2020 (US\$ billions)



Roughly 35% of its transport portfolio is for projects co-financed with other development banks – primarily the ADB, World Bank, EIB, EBRD, and the Black Sea Trade and Development Bank (BSTDB).

Chinese urban transport lending, year by year, compared

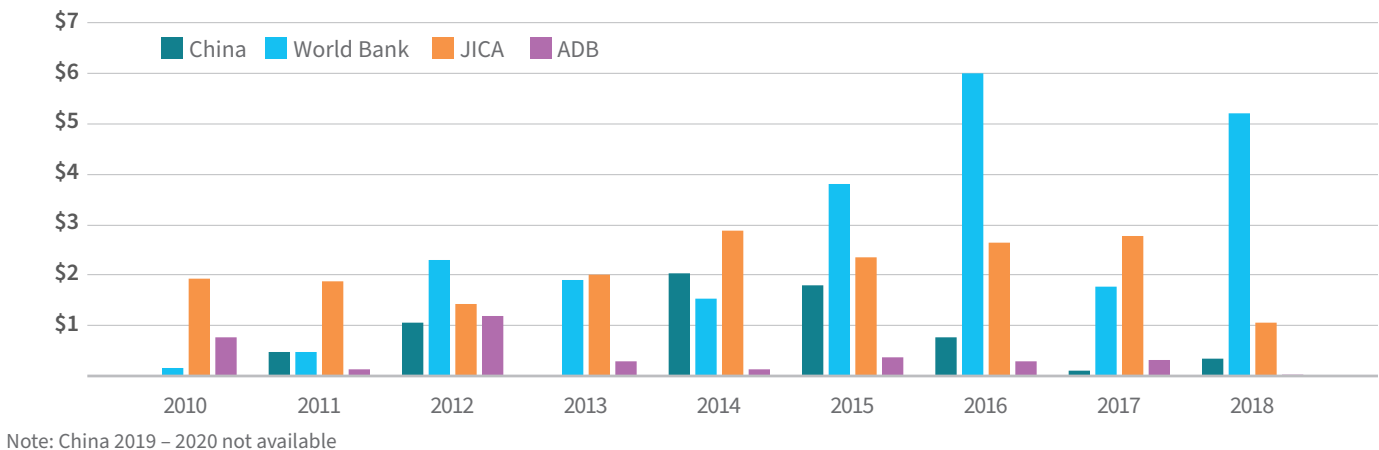
China's export credit to the urban transport sector represents less than 1/10 of China's concessionary lending to the transport sector, and its domination of transport financing is less pronounced in the urban sector. Nonetheless, China has still emerged as a significant player in urban transportation financing on the global stage. From 2010 to 2018, China has provided approximately \$9.6 billion for urban transportation projects, an average of around \$737 million annually.²

On average this is less than JICA at \$2.5 billion per year, or the World Bank which lends around \$2 billion per year to the urban transport sector. Chinese urban transport sector lending is more than that of the ADB which lends \$506 million per year on average to urban transport.

¹ Data was taken from Boston University's China's Development Finance Database <https://www.bu.edu/gdp/chinas-overseas-development-finance/>, supplemented with the Johns Hopkins University's School for Advanced International Studies' China-Africa Research Initiative's Chinese Loans to Africa Database <http://www.sais-cari.org/data>. Data for 2019 – 2020 was not yet available for China. World Bank data is for transport and flood damage repair, taken from <https://data.worldbank.org/topic/infrastructure>. JICA data is taken from their website: https://www2.jica.go.jp/en/yen_loan/index.php. ADB data is taken from their website: <https://data.adb.org/dataset/operational-procurement-database>. The ADB changed the way their data was presented in 2016, so comparable data was only available from 2016 on.

² Data from Boston University's China's Development Finance Database <https://www.bu.edu/gdp/chinas-overseas-development-finance/>, which includes the Johns Hopkins University's School for Advanced International Studies' China-Africa Research Initiative's Chinese Loans to Africa Database <http://www.sais-cari.org/data>. This data was painstakingly compiled from internet searches, interviews with ministries of finance in the host countries, and other sources.

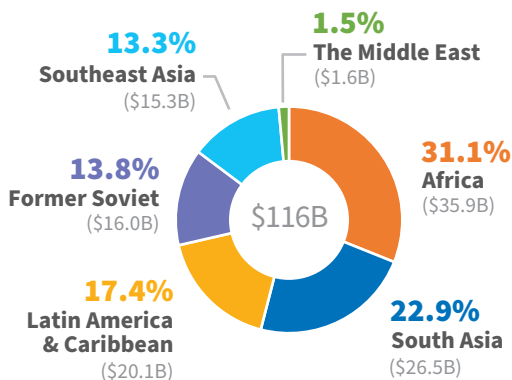
Figure 4. Urban transport sector lending by institution, 2010 – 2018 (US\$ billions)



Chinese transport lending by region, compared

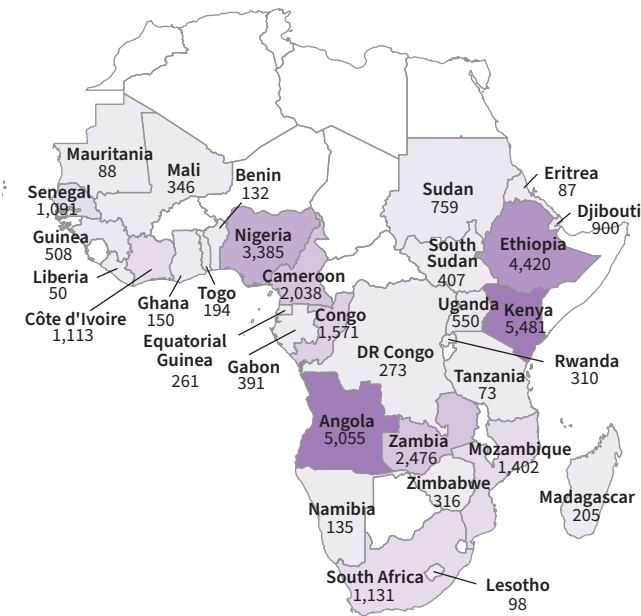
China’s export credit tends to be heavily targeted to a few countries, though in Africa it is somewhat more widely dispersed. Most of China’s export credit lending for transport has gone to Africa, followed by South Asia (Pakistan and Sri Lanka predominate), former Soviet countries (the BRI focused on former Silk Road countries of Central Asia), and Southeast Asia.

Figure 5. Chinese transport sector lending by region, 2010 – 2018



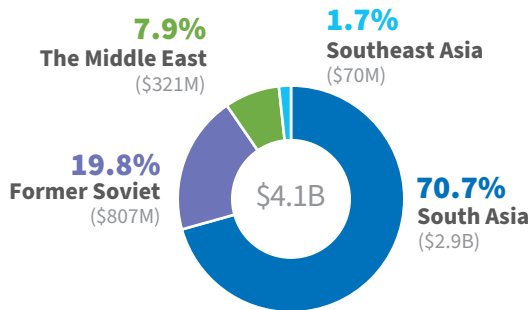
Within Africa, China’s lending is reasonably dispersed, but a few countries predominate: Angola and Kenya received the most, followed by Ethiopia and Nigeria, then Zambia, Sudan, and South Africa.

Figure 6. Chinese transport loans to Africa, 2010 – 2018 (millions of US\$)



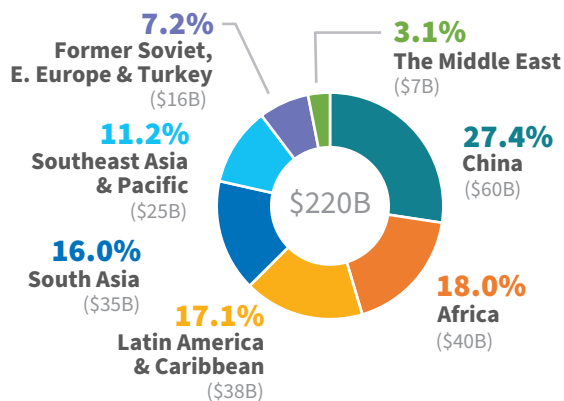
In South Asia, about 60% of Chinese transport funding went to Pakistan, another 20% to Sri Lanka, and the balance was divided between several other countries. China’s ECAs have not lent to India. However, there have been extensive AIIB loans to India, and Chinese companies have won many of the ICB tenders. The AIIB therefore represents a way in which China has been able to win contracts in India, a country that in general is resistant to awarding contracts to Chinese firms for geopolitical reasons.

Figure 7. AIIB lending by region, 2010 – 2020



South Asia accounts for 71% of AIIB lending, of which India accounts for 57%, worth about \$3.3 billion. If AIIB loans were included as part of China's bilateral development lending, India would rank third after Sri Lanka.

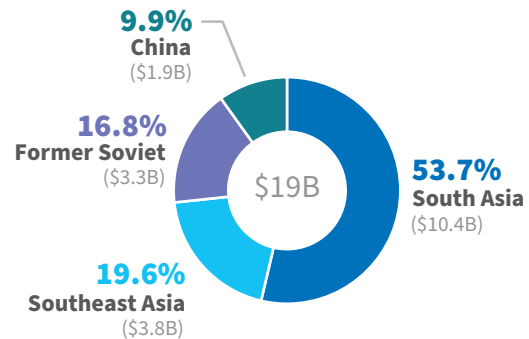
Figure 8. World Bank transport lending by region, 2010 – 2020



Curiously, China continued to be the largest single recipient of World Bank transport loans throughout the decade, followed by all of Africa, all of Latin America, all of South Asia, and all of Southeast Asia. The World Bank has a much stronger and more diversified presence than China in Latin America and Southeast Asia.

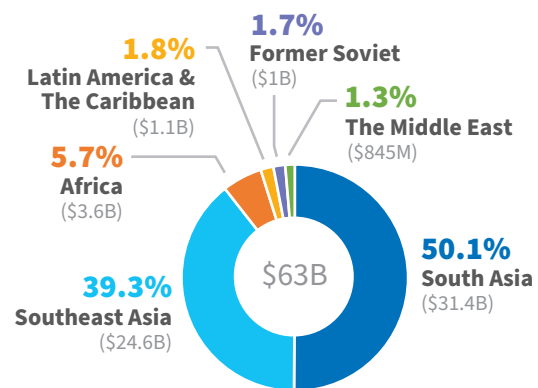
The ADB also continues to lend to China for transport. China borrowed \$1.9 billion from 2016 – 2021. The majority of ADB transport lending went to South Asia, with India being the most important (\$4.9 billion), followed by Bangladesh (\$2 billion), Pakistan (\$1.5 billion) and Sri Lanka (\$1 billion). The ADB was also a major lender to Afghanistan. The loans to Southeast Asia are dominated by the Philippines (\$1.6 billion). Otherwise, the loans are fairly widely dispersed across Asia.

Figure 9. ADB transport loans by region, 2016 – 2021



Japan's lending is more heavily concentrated in South Asia, with Southeast Asia second, and Africa a distant third.

Figure 10. JICA transport lending by region, 2010 – 2020



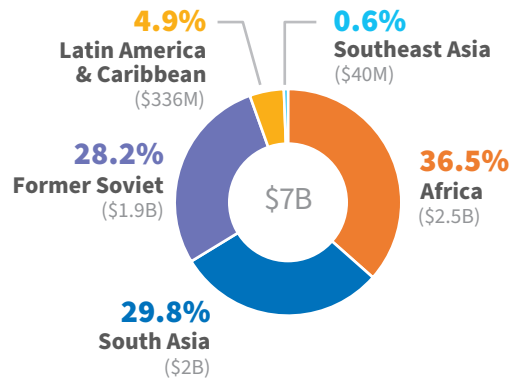
At the country level, roughly 33% of total Japanese lending, or \$20.6 billion from 2010 – 2020 went to India. Another 14% went to Bangladesh, 14% went to the Philippines, and 12% went to Vietnam.

In essence, geopolitics play some role. Japan has tended to support India, China's main competitor in the region, as well as Bangladesh, while China has supported its long-time ally Pakistan and other regional rival to India, Sri Lanka. Otherwise, Japan remains active in China's regional rival Vietnam, and other former Japanese co-prosperity countries of Southeast Asia, while in Southeast Asia, China has only been heavily active in Cambodia and Laos. The ADB and World Bank have been more neutral.

Chinese urban transport lending by region, compared

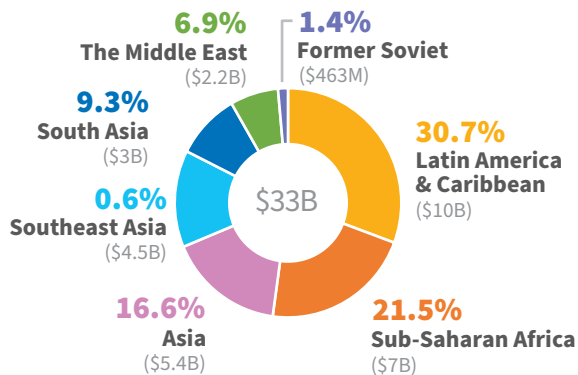
Like its overall transport investments, China's urban transport investments are also mostly directed to Africa, followed by South Asia and the former Soviet Union countries. China's urban transport sector lending is noticeably absent in Southeast Asia.

Figure 11. Chinese urban transport sector lending by region, 2010 – 2020



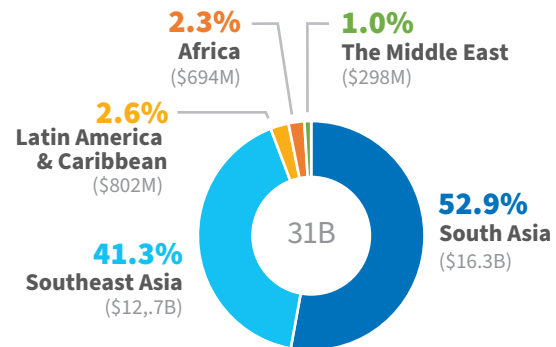
As one might expect, the World Bank's urban transport portfolio is broader. Its urban program is active in Latin America, Sub-Saharan Africa, Asia, South Asia, Southeast Asia, and the Middle East.

Figure 12. World Bank urban transport sector lending by region, 2010 – 2020



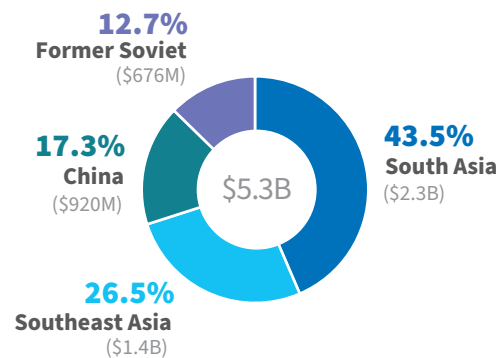
JICA's urban transport funding has a similar focus as its overall transport funding which is unsurprising since urban transport is a large share of their portfolio. JICA's urban transport portfolio includes little in Africa. Most its urban sector loans have been to South Asia (India, Bangladesh, and Sri Lanka) and Southeast Asia (Philippines, Vietnam, Indonesia, and others).

Figure 13. Japanese (JICA) urban transport sector lending by region, 2010 – 2020



The ADB's urban transport portfolio is dominated by lending to South Asia, followed by Southeast Asia, China, and the former Soviet republics of Central Asia. At the country level, India and Vietnam predominate, followed by China, which continues to receive ADB loans in the urban sector when it has a project that requires international technical support.

Figure 14. ADB urban transport sector lending by region, 2010 – 2020

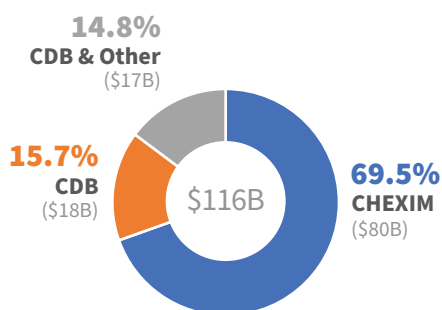


“Over the last decade, while China came to dominate transport lending worldwide, it remained the single largest recipient of World Bank transport loans.”

Sources of Chinese transport lending

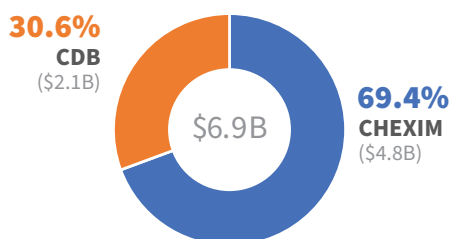
Most of China's loans have been made by CHEXIM, followed by the CDB. Most of the lending from China's commercial-oriented state banks was co-financed with the CDB.

Figure 15. China's ECA transport lending by Institution, 2010 – 2018



China's urban transport sector loans follow roughly the same pattern.

Figure 16. Urban transport sector lending by source, 2010 – 2018

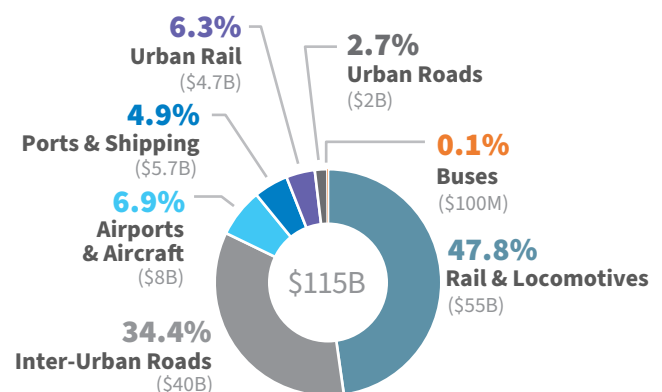


China's transport lending by mode, compared

China's transport lending by mode

China's loans in transport are dominated by intercity rail and locomotives (48%), followed by intercity highways (34%, many of them toll roads), followed by airports and aircrafts (7%), ports and shipping (5%) then urban rail (4%). Bus and bus rapid transit (BRT) investments are negligible, though there have been some efforts. China is, in fact, financing the procurement of buses but it is doing so primarily through commercially-oriented state banks, not its development banks.

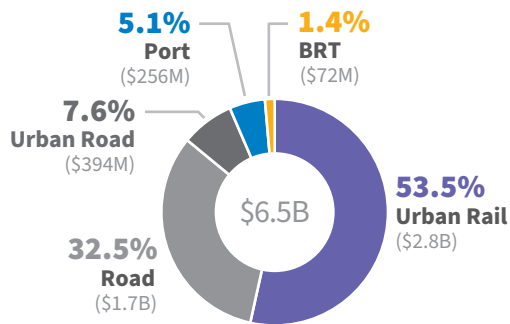
Figure 17. China's ECA transport lending by mode, 2010 – 2018



AIIB transport lending by mode

The AIIB lending is dominated by urban rail sector loans, followed by loans for intercity and urban roads. Some money has also gone to ports, and one loan went to BRT. Most of these have been co-financed with other MDBs. They have not made intercity rail loans.

Figure 18. AIIB transport lending by mode, 2016 – 2020

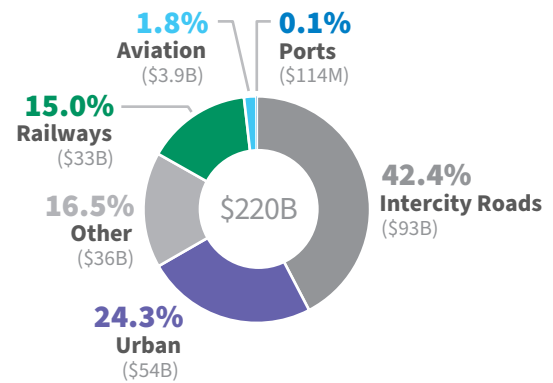


World Bank transport lending by mode

The World Bank's database classifies its loans into several types:

- **Investment project loans:** These are traditional World Bank transport loans for a specific road, railway, or other specific transport investment.
- **Policy loans:** These loans provide government budget support, dispersed against the achievement of various benchmark policy objectives. Because these loans go directly to the government, it is not possible to determine what they ultimately funded.
- **Program for Results and Specific Investment Loans (PFR):** These are loans targeted to specific sectors for specific programs. These may go to climate resilience, road safety, tourism promotion, or other economic or social objectives. The loans are also in the form of budget support for a portfolio of related investments.
- **Technical assistance loans:** These loans generally finance technical assistance and capacity building for a particular sector.

Figure 19. World Bank transport lending by mode, 2010 – 2020

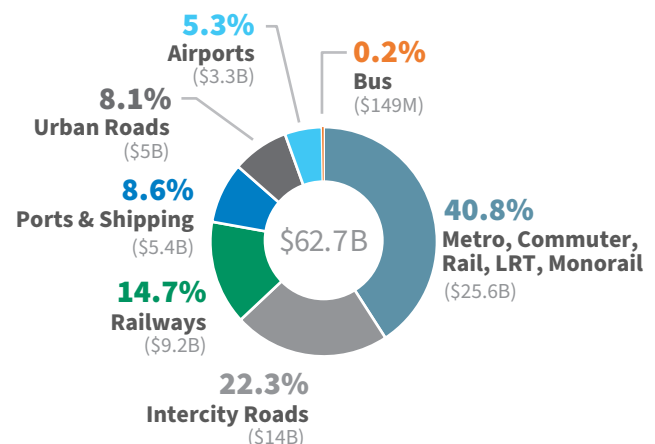


The World Bank continues to invest most of its transportation funds into inter-city and rural roads, which constitutes 42.4% of its total portfolio. In addition, there are more urban road projects within the loans categorized as 'urban' which are broken out in the next section. These constitute 24.3% of the total portfolio. The World Bank also finances intercity railways. The last category, 'other', includes most of the 'program-for-results' loans, 'specific investment' loans, and 'policy' loans, though it also includes some traditional investment projects where the reason for the 'other' classification was unclear.

JICA transport lending by mode

Japan's JICA portfolio, by contrast, is dominated by urban rail, (41%), followed by intercity roads (22%), intercity railways (15%), ports (9%), urban roads (8%) and airports (5%). Japan is also supporting some countries like Laos with used Japanese buses in the form of grants.

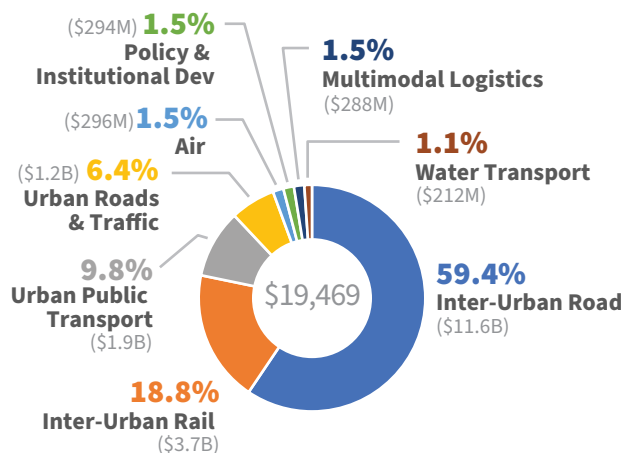
Figure 20. JICA transport lending by mode, 2010 – 2020



“Both Chinese and Japanese ECA lending for transport is more rail-oriented than the MDBs, which tend to be more road-oriented.”

ADB Transport Lending by Mode

Figure 21. ADB transport lending by mode, 2016 – 2021³



The ADB reports that from 2010 to 2017 about 71%, or \$25 billion of their loans went to intercity roads.⁴ From 2016 – 2021 this share fell to about 59%, but intercity roads remained the predominant mode. Intercity rail was the next most significant (19%), followed by urban public transit, the majority of which is urban rail (10%), and urban roads (6%).

As such, it is clear that both Chinese and Japanese ECA lending for transport is more rail-oriented than the MDBs, which tends to be more road-oriented.

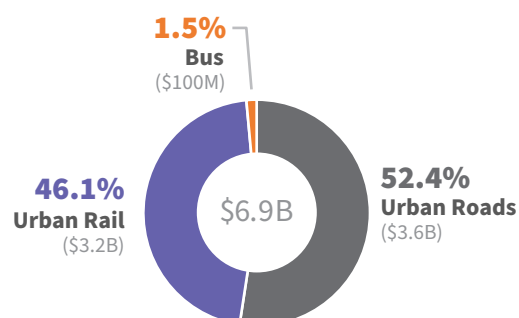
China's urban transport lending by mode compared with other MDBs

While most of China's transport sector lending is dominated by intercity rail and highways, here we compare China's lending to urban transport specifically, with the other MDBs and JICA.

Chinese urban transport lending

The modal breakdown of Chinese ECA lending to urban transport has been focused on rail-based public transport over the last decade, constituting some 69%, or \$4.7 billion. The next largest share goes to urban road projects, at 30%, or \$2 billion. Loans for other forms of urban transport were marginal.

Figure 22. Chinese ECA lending for urban transport by mode, 2010 – 2018



The rail projects include LRT projects in three cities: Abuja, Nigeria; Addis Ababa, Ethiopia (to be discussed in Chapter 4); and Astana, Kazakhstan. They also include a metro project in Lahore, Pakistan, and commuter rail cars for Argentina. China's lending for heavy rail metros has been modest, perhaps because the industry is fully engaged building metros domestically. If China follows the progression of Japan, there is likely to be a huge acceleration of metro lending outside the country in the years to come as Chinese cities' metro systems become fully built out and there is surplus metro construction capacity.

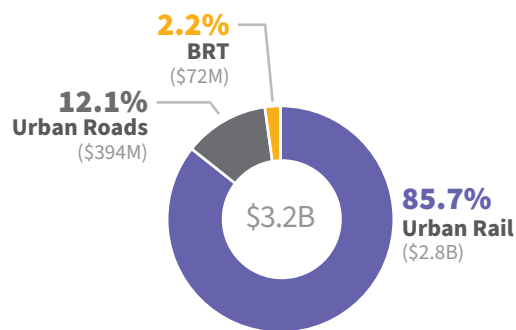
The urban road projects include the airport road in Ulaanbaatar, several urban ring roads (Addis Ababa, Maputo, Nairobi, etc.), and some smaller urban road projects, mostly in Africa.

The AIIB has also been heavily involved in urban transportation. Most of their urban loans have gone to urban rail projects, including the Bangalore Metro, commuter rails in Delhi (the Delhi – Meerhut line) and Mumbai, and the Izmir metro in Pakistan.

³ Data for 2010 – 2015 was not available in this format on the ADB web site.

⁴ T. Yokota, et.al. "Evaluation Approach Paper: Sector Wide Evaluation: ADB Support for the Transport Sector", January 2019, Asian Development Bank. <https://www.adb.org/sites/default/files/evaluation-document/487496/files/eap-se-transport.pdf>.

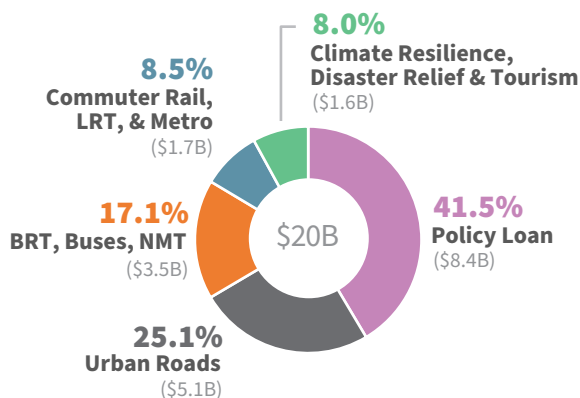
Figure 23. AIIB urban transport lending by mode, 2010 – 2018



The only BRT project funded by China to date is the Karachi Red Line, co-financed by the AIIB and the ADB. The Red Line BRT project, led by the ADB is a promising project. BRT is an area of urban transport where Chinese ECAs could become more active.

World Bank Urban Transport Lending

Figure 24. World Bank urban transport loans by mode, 2010 – 2020



Most World Bank urban transport lending for specific modes is made via its Project Loans. The World Bank as a matter of policy insists that at least 50% of the loans are project loans, as these are the loans where member countries can win contracts. In the urban transport sector, the largest share, or 41%, of total lending has gone to policy loans, where budget support is provided in exchange for meeting policy or capacity-building benchmarks.

Most project loans (25% of the total) have funded urban roads. Many of these loans have significant road safety goals and may provide better pedestrian, bike or public space infrastructure than would have otherwise been the

“There is likely be a significant acceleration of Chinese ECA lending for metros in the years to come, as China’s own metro systems become fully built out.”

case, but it is not easy to determine in aggregate. Whether these goals have been achieved requires a more in-depth investigation.

BRT, BRT-lite, and general bus-related loans have been responsible for about 17% of total World Bank urban transport lending. World Bank Project Loans were responsible for the rapid scale up of the BRTs in Colombia, Lima, and Dar es Salaam; the BRT-lite in Lagos; the BRTs under construction in Dakar and Abidjan; planned BRT in Beirut; and the planned BRT-lite in the Philippines and Vietnam. They have also funded a number of bus facilities and bus procurements, in China and Brazil. The World Bank has thus been, and continues to be, a key player in the financing of BRTs and bus facilities around the world.

Commuter rail, LRT, and MRT projects were responsible for about 8% of World Bank Project Loans. The World Bank funded a metro line in São Paulo, several in China, one in Quito, one in Lima, Peru, and one recently in Bogotá, Colombia. A loan for the LRT in Surabaya, Indonesia was prepared but the project never progressed to the implementation stage.

Exclusively non-motorized transport (NMT)-supporting loans were about 0.2% of the urban transport loans, but there are many NMT components in the road and sector loans that are not easy to isolate.

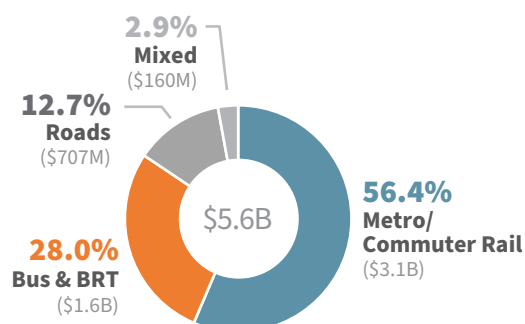
There are relatively few Program For Results loans in the urban sector, constituting about 8% of lending. This is because the World Bank will not provide PFR loans if there are any sub-projects which involve involuntary resettlement or have significant environmental sensitivities.

Many of these loans related to resilience or protecting critical infrastructure from storms and floods. Much of this likely goes to roads but would target those expenditures that make the infrastructure more resilient against floods or storms. A few (0.5%) PFR loans have gone to the tourism sector, usually where urban roads and possibly transit or NMT elements constitute a part of a package of investments aimed at promoting tourism. Again, because these loans go directly to the government, it is not possible to determine what they ultimately funded.

ADB urban transport lending

ADB lending is mostly project-based and hence the mode is easier to identify.

Figure 25. ADB urban transport lending by mode, 2010 – 2020



The majority of funds at the ADB went to a few large heavy rail metro projects: co-financing of the Bangalore metro with China; a metro in Jaipur, India; two lines in Dhaka, Bangladesh; and metros in both Hanoi and Ho Chi Minh City in Vietnam.

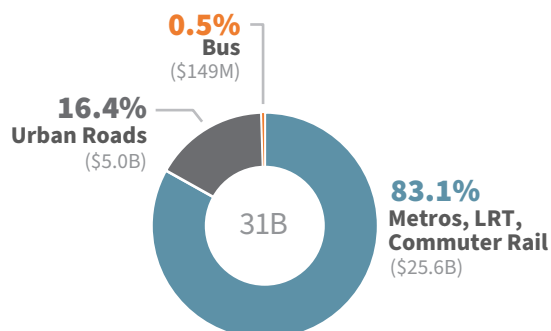
The ADB has also been a primary financier of BRT projects in Asia including: Yichang and Lanzhou, China; the Peshawar and Karachi Red Line in Pakistan; and several as yet unrealized BRTs in Ulaanbaatar, Vientiane, and Dhaka.

Many of these ADB urban transport projects are a best practice in terms of what is included in the loan, with complementary support for NMT improvements, travel demand management, traffic management, and other critical measures, though implementation sometimes lags behind ambition.

JICA urban transport lending

JICA's urban transport lending has predominantly been to heavy rail metros, with some commuter rail and LRT projects.

Figure 26. JICA urban transport lending by mode, 2010 – 2020



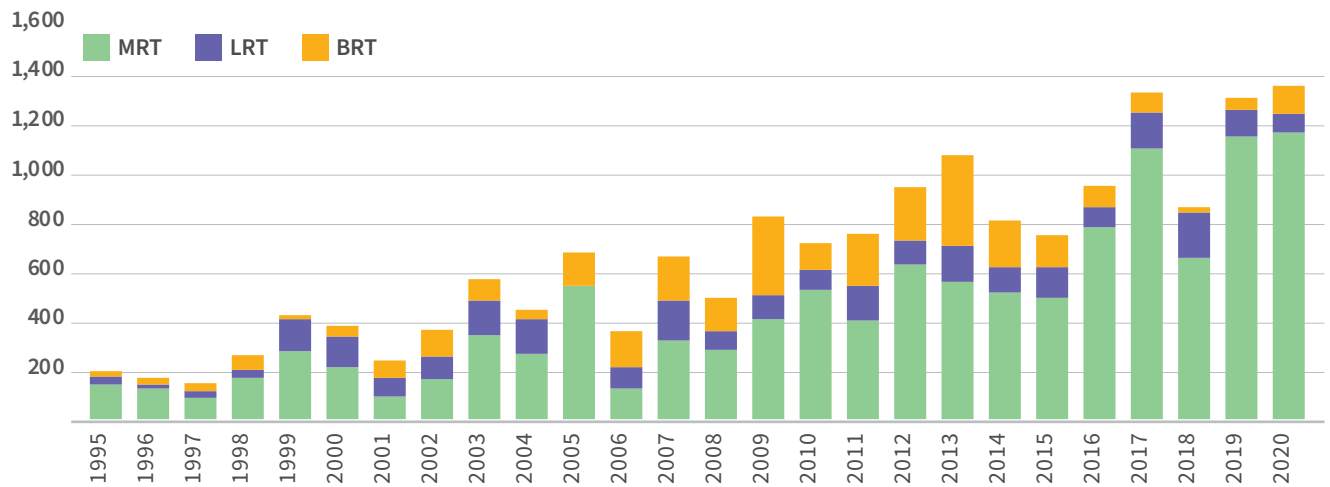
JICA is responsible for financing a huge number of metro projects, particularly in India, Vietnam, Bangladesh, and Jakarta, Indonesia. They have smaller MRT or commuter rail investments in Thailand and the Philippines. Japan has a huge domestic metro construction industry with nowhere to grow except outside the country, so the Japanese government has been supporting this expansion extensively through JICA. They also fund urban road projects in Vietnam, the Philippines, Myanmar, and they are funding some urban highway interchanges in several African cities, particularly in Kampala, Mombasa and Abidjan.

Other ECA urban transport lending

Compiling data on the activities of other ECAs is beyond the scope of this paper. Anecdotally, the German KfW bank, supported sometimes by GIZ, and the French AFD have been the main players in urban transport. The KfW and AFD have jointly funded a few metros in India such as the Nagpur Metro and the Bangalore Metro. KfW funded line 4 of the Mumbai metro. The AFD plans to finance a metro line in Pune, India, together with the EIB, and is also involved in a metro in Surat.

On the BRT side, AFD has been funding parts of projects in Amman, Jordan for instance, and in Agadir, Morocco. A BRT in Addis Ababa is being co-financed by the AFD and a second corridor by the Korean Export Import Bank. The AFD and the Korean Export Import Bank also financed some subway construction and trains to Cairo. The AFD is also a minor co-financier of the Karachi Red Line BRT, led by the ADB. The AFD also made a big push to fund LRT systems in India, but this has not been met with much support.

Figure 27. Annual kilometers of new rapid transit infrastructure added



Data: Hook, W, “Global Expansion of Rapid Transit Slows...Outside of China”. People-Oriented Cities, March 22, 2021.

The US Export Import Bank is not extensively involved in transport other than in the sale of aircraft and air traffic control equipment, which accounts for roughly 39% of its total portfolio. Other than this, the US is not a significant player in overseas transportation development.

Overall trends in Chinese transport lending

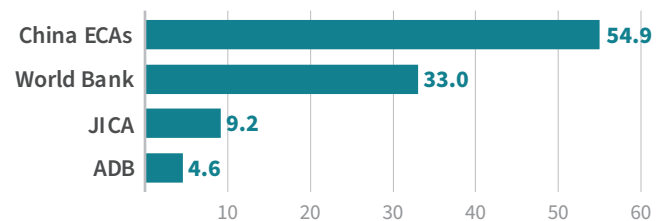
The aggregate effect of all urban transport lending globally has been to accelerate the increase in global kilometers of rapid transit until about 2014. After 2014, the increase slowed, with the exception of China which is building metro projects domestically at a historically unprecedented rate,⁵ and to a lesser extent India’s construction of metros which have been heavily financed from JICA, European export credit, and AIIB loans.

A significantly increased role for Chinese ECAs could be to expand rapid transit investment outside of China. While there will be a temptation to heavily invest in metros, more consideration of BRT should also be given for reasons explained in later chapters.

The comparison of China’s overseas transport sector lending against that of other ECAs and MDBs yields the following conclusions:

- 1. China dominates intercity rail lending:** China clearly dominates intercity rail lending and lends more for intercity rail than the MDBs or other ECAs by far.

Figure 28. Intercity rail lending 2010- 2018: China compared to WB, JICA, and the ADB⁶



Note: ADB figure are estimates only

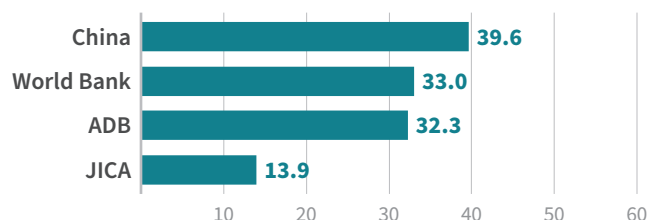
China’s domestic railway is the busiest in the world and China’s Rail Rollingstock Corporation (CRRC) is the largest manufacturer of rail equipment in the world. Rail is thus a major overseas market for China.

- 2. China dominates intercity road lending, though the MDBs remain important:** China is heavily involved in intercity road lending, providing almost \$40 billion in loans from 2010 – 2018. The MDBs and some other ECAs also remain heavily involved in road lending. Many of the roads funded by China are toll roads or other important national roads. The World Bank is more likely to fund rural roads, though it also funds major highways.

⁵ Hook, W, “Global Expansion of Rapid Transit Slows...Outside of China”. People-Oriented Cities, March 22, 2021. <https://reorientations.medium.com/global-expansion-of-rapid-transit-slows-outside-of-china-d02989695c00>

⁶ Data for China, World Bank and JICA as per previous data citation, data for the ADB estimated from T. Yokota, 2019, op.sit supplemented with ADB procurement data for 2016 – 2018 (op sit).

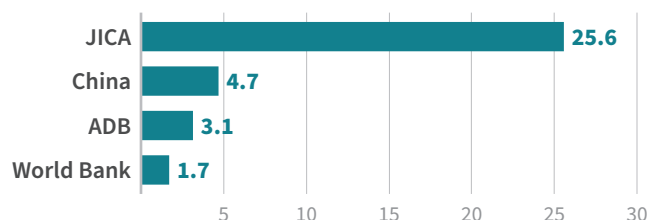
Figure 29. Intercity road lending 2010-2018: China compared with the World Bank, ADB, and JICA⁷



Note: ADB figure are estimates only

- 3. China is a distant 2nd to JICA in lending for urban rail:** China is also lending heavily for urban rail projects (LRT, Metro, Commuter Rail). Though its roughly \$5 billion in commitments is much greater than the World Bank's \$2 billion over the last decade, it is only 1/5 of JICA's \$25.5 billion. One should fully expect to see China moving heavily into this market in the coming decade as domestic metro construction slows.

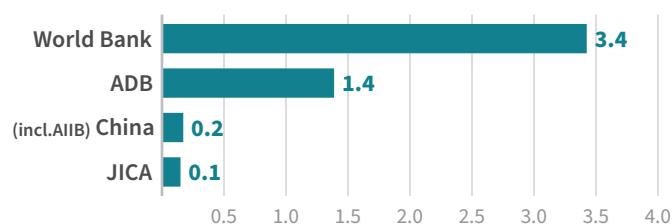
Figure 30. Urban Rail Lending 2010 – 2018: China compared with the World Bank, ADB, and JICA



Note: ADB figure are estimates only

- 4. China lags in BRT financing:** China's ECAs to date have not invested in BRT, though the AIIB has co-financed one project in Pakistan. The World Bank and the ADB have been much more focused on BRT and bus sector investments. Several of the ADB's BRT projects, particularly those in China and Pakistan are best practice gold-standard BRT systems. China has excellent BRT systems and its companies could do more overseas.

Figure 31. BRT and bus lending 2010 – 2018: China compared with the World Bank, ADB, and JICA



Note: ADB figure are estimates only

- 5. China's ECA lending to transport has decreased more sharply than the MDBs recently:** Recent trends indicate lending in the mid-2010s may not be sustained. China's overseas ECA transport lending has been dropping sharply since 2016. The other MDBs also saw a significant drop in their lending since 2016, but China's drop is sharper than that of the MDBs.

China watchers at the China Africa Project indicate that the days of easy Chinese money may be ending. According to them:

*"Chinese development finance lending in Africa and elsewhere throughout the Global South has cratered in recent years and it appears that Beijing has, at least for now, lost interest in loaning vast sums of money to poor countries to build infrastructure. To be sure, Chinese creditors are still making loans, just that they're a lot smaller, less risky, and demand air-tight feasibility studies that almost guarantee they'll get their money back."*⁸

The CARI program at SAIS comes to the same conclusion. Overall, China's concessional lending dropped by 30% between 2018 and 2019. They attribute it to two principal factors: increasing wariness about bad debt, and a growing role of China's commercial credit institutions. Loans from CHEXIM have been steadily falling since 2013, while those of the Chinese Development Bank, which are nearly at commercial interest rates, and those of China's other banks at commercial rates, have been increasing to fill the gap.⁹

⁷ Ibid.

⁸ E. Olander. "An Update on Chinese Lending in Africa (Its not good news)" The China Africa Project, Podcast June 18, 2021. <https://chinaafricaproject.com/podcasts/an-update-on-chinese-lending-in-africa-its-not-good-news/>

⁹ Brautigam D. and Acker, K. 2021. Twenty Years of Data on China's Africa Lending. China Africa Research Initiative, Briefing Paper #4. <https://static1.squarespace.com/static/5652847de4b033f56d2bdc29/t/605cb1891cb0ff5747b12167/1616687497984/BP+4+-+Acker%2C+Brautigam+-+20+Years+of+Data+on+Africa+Lending.pdf>

Challenges with Chinese Overseas Lending

China has been extremely successful in quickly scaling up overseas transport lending. It has demonstrated success in the following areas, as compared to the MDBs and ECAs of other countries:

- **Fast, on-time project delivery:** Chinese-financed projects have a better track record of finishing projects on or before deadlines
- **Low project cost:** Chinese-financed projects tend to be completed at a relatively low cost.
- **Long-term view:** China has been willing to take long term risks and invest in projects other donors will not.

However, China faces several challenges which result in problems for the borrowing countries, problems for China, and a weakened image of its lending practices:

- **Debt problems:** Chinese transport loans have significantly contributed to debt problems in some countries
- **Too focused on megaprojects:** Chinese loans have prioritized megaprojects, often with insufficient planning and weak economic returns, and these projects have crowded out smaller investments with higher returns.
- **Non-transparency in procurement practices:** Chinese development has shied away from international competitive bidding, which results in lack of transparency and has raised questions of corruption.
- **Financing of environmentally- and socially-sensitive projects:** Chinese environmental and social due diligence is weaker than other development institutions
- **Labor issues:** Chinese-financed projects hire less local labor and pay lower wages

In this chapter, we describe the challenges in detail. In Chapter 4, we will present a series of case studies which highlight both the successes and challenges discussed here.

Debt problems

Until 2017, the scale of Chinese lending for transport megaprojects was so large in some developing countries that Chinese transport loans alone were a significant cause of debt distress. In many other countries, transport loans were part of a larger package of Chinese loans that together contributed to significant debt distress. While the current debt distress faced by many poor countries was made worse by the Covid-19 pandemic, the debt problems in most cases predate the pandemic.¹

Some of the reasons why Chinese transport loans have contributed to developing country debt crises are unique to China, and other reasons are similar to mistakes made by the MDBs in the past.

Chinese lending, like its domestic spending, tends to move in fits and starts. In periods of expansionary fiscal policy, China is likely to approve many loans with only limited financial and economic due diligence. According to one ADB evaluator,

“Approximately half of all BRI projects generate no economic value, and of the projects that do generate some positive economic value, only around 1 in 10 will generate enough revenue to break even, let alone be profitable.”²

An extensive World Bank analysis goes farther and explicitly attributes the debt problems to BRI lending:

“Of 43 economies analyzed, 12 are expected to increase their debt vulnerability as a result of BRI investment over the medium term.”³

¹ D. Cash. “A looming Debt Crunch Demands New Thinking” Open Society Foundation Voices, June 7, 2021. <https://www.opensocietyfoundations.org/voices/a-looming-debt-crunch-demands-new-thinking>

² J. Lane. 2020. “Re-evaluating the economic benefits of the Lao PDR – PRC Highspeed Rail and Its Implications for Fiscal Stability of the Lao PDR”. ADB Working Paper Series No. 1181. <https://www.adb.org/sites/default/files/publication/634766/adb-wp1181.pdf>

³ Belt and Road Economics: Opportunities and Risks of Transport Corridors. World Bank, 2019, p. 99. <https://www.worldbank.org/en/topic/regional-integration/publication/belt-and-road-economics-opportunities-and-risks-of-transport-corridors>

China does not follow IMF guidance regarding overall lending caps to indebted countries. The IMF in some cases does not know about key elements of Chinese loans, undermining the effectiveness of IMF debt regulation more generally.⁴

The MDBs, by contrast, require rigorous economic and financial due diligence on the loans which will tend to weed out the worst white elephants. They also limit their lending to a cap set by the IMF based on the overall indebtedness of the country.

The MDBs, however, continue to treat road sector loans differently from rail and transit sector loans. While rail and transit sector loans are subject to a financial and an economic appraisal, their road sector loans are only subject to an economic appraisal. As a result, there is a reasonable risk that the road sector loans from the MDBs are also contributing to indebtedness.

A financially successful transportation infrastructure investment must:

- **Grow the economy:** the investment should stimulate economic growth; and
- **Increase government revenue:** the growth should generate more tax revenue than is required to service the debt.

The former is supposed to be measured by economic appraisal, and the latter by financial appraisal.

The MDBs continue to hold the sanguine belief that building transportation infrastructure, particularly roads, will automatically translate into economic development and rising government revenue. This economic development boost, it is believed, will automatically generate more than enough additional government revenue to pay off the loan. This, despite the fact, that researchers have known since the 1980s that this simply isn't true. Governments rarely have the means of collecting revenue from road users that can then be reliably invested in ongoing maintenance.

One analysis of Zambia done by the World Bank indicated that in the early 1990s, road-related debt and shortfalls in maintenance requirements consumed about 17% of total government revenue,⁵ while the government had no mechanism like a road fund for capturing any revenue from road users.

“Road sector loans from the MDBs are also contributing to indebtedness.”

As such, in the last several decades, the MDBs have financed relatively few projects with poor financial returns in the rail or public transit sectors, while China has been willing to lend for projects with very poor financial and economic returns.

In the road sector, on the other hand, China has mainly funded toll roads which, though unlikely to recoup their investment should at least raise enough revenue to cover ongoing maintenance. The MDBs, by contrast, have financed many toll-free highways and rural roads with relatively light traffic, where road fund revenues are insufficient to handle existing ongoing maintenance needs, and these loans are likely to have contributed to the country's debt problems as well.

Megaprojects

China has focused on building big new roads and railways on entirely new rights of way, when upgrading the road or railway on the existing right of way – or simply addressing traffic bottlenecks through traffic management – would have cost a lot less and had many more beneficiaries. It also financed several LRT projects when BRT projects would have done more for less.

In the best of all worlds, MDBs and ECAs would focus on projects that did the most to grow the borrower's economy, alleviate the most poverty, and do so in an environmentally sustainable way. Development experts have a reasonable sense of what such a loan portfolio might look like.

In a best-case scenario, a government would use its scarce transportation investment funds where they would yield the best economic and financial results. Having the procedures in place to prioritize transportation investments at the national level is thus the first priority. A few rules of thumb could guide the prioritization process.

Intercity transport projects should be prioritized as follows:

- **Fix-it first:** Maintenance of existing transport assets (roads, rail tracks, etc.) should be the first priority, and usually yields the best economic results. If a government has a backlog of unmet maintenance needs, new

⁴ S. Horn, C. Reinhart, and C. Trebesch, “China's Overseas Lending” NBER Working Paper Series, 26050, July, 2019 (NBER: Cambridge, MA). https://www.nber.org/system/files/working_papers/w26050/revisions/w26050.rev0.pdf

⁵ For a more in-depth treatment of the issue, see Hook, W. and J. Howe, *Transport and the Millennium Development Goals*, 2005. (New York, ITDP) p. 16 – 18.

“New urban arterials should be safe and comfortable for use by all modes, including cycling and walking, and prioritize public transit.”

infrastructure may be ill-advised. Within the roads sector, rehabilitation of the roads most heavily used, particularly by trucks, and where these roads are in the worst shape, should be prioritized. This can usually be done with regular road audits by engineers, and economic appraisal using the World Bank's HDM model will provide a reasonable indication of whether the project makes sense.

- **Intercity rail should prioritize long-haul heavy cargo:** Intercity rail freight investments make sense if heavy cargo is being transported a long distance from a few discrete locations (a mine to a port, an industrial area to a port, a major city logistics center to another major city, etc.). Freight must be moved from the rail line to the end-user, and this is expensive. The expense can only be justified if the cargo is very heavy as heavy goods are expensive to ship by truck. Intercity passenger rail is only likely to be feasible where it connects dense urban downtowns and is supported by a dense municipal public transit network on either end.
- **Focus on bottlenecks:** Intercity road capacity expansion projects should prioritize the segments of roads with the most traffic; the greatest congestion delay; and/or the worst road safety problems. Where the problem is caused by poor traffic management rather than insufficient road capacity, the traffic management problem should be resolved before investing in new capacity.

To avoid economic distortions, these roads, to the greatest extent possible should be financed from road users, in any form feasible, such as tolls, fuel levies, vehicle registration fees, parking fees, etc. to ensure that the government can repay the loan, and that the beneficiaries are the ones who pay for the investment. The equity ramifications of this are normally insignificant, as the poorest people tend to not own motor vehicles in poor countries, and the benefits of major road projects tend to be disproportionately captured by wealthier businesses and private vehicle owners.

Urban transport investments meanwhile should be prioritized as follows:

- **Complete Streets:** All major urban arterials should be safe and comfortable for use by all modes, including cycling and walking.
- **Demand Management:** Before investing in new urban roads, congestion charging, parking reform, and better traffic management should all be considered.
- **Public transport priority:** Redesigning roads to optimize the performance of public transport through such measures as Bus Rapid Transit should be prioritized on any major arterial where existing or potential transit ridership is desired.
- **BRT before LRT or MRT:** Heavy or light rail urban transit investments should only be considered for dense urban areas where the project shows a reasonable rate of economic and financial return, where no lower cost BRT alternative could achieve the same rate of return (capacity and speed), or where the country is wealthy enough to afford a rail line even if there are options with a higher rate of return.

From these perspectives, China is lagging behind the MDBs while performing similarly to the other ECAs.

Transparency in procurement practices

In general, the procurement procedures at the MDBs tend to encourage cleaner, more transparent project outcomes than those managed by the procurement rules of the ECAs. Among ECAs those who are signatories to the *OECD Arrangement* tend to have better project outcomes than those that are not.

The MDBs tend to separate project preparation from project implementation contractors. The government, together with a group of firms and experts, develop the project. Those that developed the project are typically not allowed to bid on the project itself. Then, the selection of the firm to build and operate the project is handled through a reasonably transparent process. For large projects, the companies are selected through international competitive bidding (ICB). The tenders, the agreements, and other project documents are posted on the MDB websites. Though far from perfect, the MDBs' ICB process tends to give the borrowing government the best chance to define the project and to select the lowest cost, highest quality company to implement the project. As the tender is public, it is also a key source of information available to the public for project scrutiny. Critically, though it will not fully solve the problem, a transparent ICB process tends to place a check on corruption in the procurement process.

All the ECAs are supposed to use ICB for at least a significant percentage of their lending, though in practice they are all adept at writing the tenders in such a way as to ensure that they favor their own nationals. They do tend to release information about the tender publicly, however.

China's lending from its policy banks is notably less open to ICB and less transparent than the other ECAs, though in some CHEXIM projects, Chinese companies won an ICB.

Some lending countries also have stronger anti-corruption measures than China. Back in 1977, the US passed the Foreign Corrupt Practices Act which makes it illegal for US companies to engage in corruption overseas. This law has been reasonably tightly enforced. Since then, most European countries have passed similar or even tighter laws, but enforcement is said to be more or less lax depending on the country. Since 2010, China also has laws prohibiting the bribing of foreign officials, but by 2018, there had been no cases of enforcement actions.⁶

As a result, Chinese state enterprises have been somewhat more prone to becoming embroiled in corruption scandals. Frequently, the problem is that China is dealing with a regime where corruption is rife and any business deal requires becoming involved with some form of corruption either directly or through local subsidiaries. The example of China's involvement in the Zuma/Guptas scandal in South Africa and in a scandal in Malaysia are discussed in the Chapter 4.

Financing of environmentally- and socially-sensitive projects

China has also come under criticism for continuing to finance some inherently bad projects that other countries won't touch, like coal-fired power plants, many of them with fairly weak emissions controls. While China is hardly alone in this, the environmental consequences are clearly alarming. A recent review by Boston University indicates that China is the largest source of concessional lending for coal-fired powerplants overseas, but Japan, Russia, and Korea are also heavily involved in state-backed financing for coal-fired power plants. In terms of total financing

for coal-fired powerplants, including private commercial lending and equity investments, the United States through institutional investors dominates.⁷

The Johns Hopkins School of Advanced International Studies China Africa Research Institute and the Boston University Global Development Policy Center built a nearly exhaustive database of CDB and CHEXIM-financed projects, and flagged those that pass through critical habitats, nationally protected areas, or through indigenous people's lands. Hundreds of intercity road and rail projects pass through one of these three designations of sensitive lands. There are particularly large concentrations of road or rail projects through sensitive lands in countries with the heaviest CHEXIM lending, such as Angola, Bolivia, Cambodia, the Republic of the Congo, the Democratic Republic of the Congo, Djibouti, Ethiopia, Kenya, Laos, Madagascar, Maldives, Pakistan, Zambia, etc. In Chapter 4, we discuss the Nairobi Southern Bypass road which passes through a sliver of the Nairobi National Park; something it is doubtful the MDBs would have financed.⁸

A book about some of the localized effects of the BRI, *Belt and Road through my Village*, has been compiled.⁹ It is, of course, possible that a similar review of MDB funded projects may yield similar results. However, it does appear, from several examples, that China is being selected as the creditor of choice for a number of major transport infrastructure projects precisely because of its weaker level of environmental and social review.

Resettlement issues

Interviews with donor agencies indicate that China is more likely than MDBs or other countries' ECAs to proceed with a project absent adequate compensation for the victims of involuntary resettlement. Many of the criticisms of the China-Laos Railway Project, for instance, involve questions about whether those people involuntarily relocated have been properly compensated.¹⁰ This is something that the MDBs are extremely cautious about. Any transport project financed by an MDB that involves involuntary resettlement is subject to exhaustive review which goes well above and beyond what is required by the national government. This has certainly helped to ensure that victims of involuntary resettlement are paid properly. Interviews and literature

⁶ J. Tso. "Its Time to Show China's Foreign Bribery Law is Not a Paper Tiger". GAB: The Global Anti-Corruption Blog. May 14, 2018. <https://globalanticorruptionblog.com/2018/05/14/its-time-for-china-to-show-its-foreign-bribery-law-is-not-a-paper-tiger/>

⁷ X. Ma & K. Gallagher. "Who Funds Overseas Coal Plants? The Need for Transparency and Accountability. Boston University Global Development Policy Center, Policy Brief 008 07/21. https://www.bu.edu/gdp/files/2021/07/GCI_PB_008_FIN.pdf

⁸ China's Overseas Development Finance: Geospatial Data for Analysis of Biodiversity and Indigenous Lands. Boston University, Global Development Policy Center. <https://www.bu.edu/gdp/chinas-overseas-development-finance/>

⁹ *Belt and Road Through My Village*: <https://www.brivillage.asia/>

¹⁰ DiCarlo, J. Dec. 2020. *Mind the Gap: Grounding Development Finance and Safeguards through Land Compensation on the Laos-China Belt and Road Corridor*. (Boston: Boston University Global Development Policy Center. GCI Working Paper 13)

“Transparency and environmental and social due diligence are in China’s long-term interest.”

review indicated several cases where Chinese-financed projects were less rigorous in ensuring that involuntary resettlement was properly handled.

On the other hand, the resettlement process at the MDBs is so slow, cumbersome, expensive, and subject to abuse, that projects are often delayed for years and project costs can escalate dramatically. While Chinese companies also tend to avoid managing resettlement issues, they tend to leave the job to the host country. Sometimes, the host country mismanages the resettlement which results in project delays and cost overruns. With the Kampala-Entebbe toll road, the frustration of the Chinese companies is palpable:

‘In China we plan for everything. . . it is hard for Chinese to understand why the Ugandan government failed to even make a 5-year plan.’¹¹

China handles infrastructure-related involuntary resettlement domestically reasonably well since relatively recent reforms. As such, while China needs to take the resettlement issues of its projects more seriously, it might also be able to improve upon the overly cumbersome process currently used by the MDBs.

Environmental and social due diligence are all in China’s long-term interest. Financing projects with severe environmental or social consequences when other MDBs and ECAs will not, could turn China into an international pariah. While China should not, like the MDBs, become so afraid of involuntary resettlement that it is inhibited from financing any number of worthwhile transport projects, at the same time China needs to take more responsibility to pro-actively help a weak government to ensure that those involuntarily resettled are properly compensated or it is likely to become the target of local resentment.

Labor issues

When talking to the residents of countries where there are large Chinese-funded projects, the issue that most commonly arises is the use of Chinese labor at the expense of local labor. Unique among most development institu-

tions, Chinese ECA-funded projects always use Chinese companies, and these companies tend to bring in a lot more Chinese labor than companies from other countries. Chinese project managers say they are put under tight project deadlines, and it is easier and faster to use their own workers who are inexpensive, efficient and have a lot of experience. While all construction companies rely on some foreign technical experts, few if any bring in as much manual and semi-skilled labor for project delivery.

Anecdotal reports from Laos, for instance, indicate that the Chinese projects did not live up to their promised number of local laborers, or how much they would be paid. Lao laborers felt they should be paid more but whether they had the required skills is impossible to assess. On the other hand, anecdotal comments from experts from the former Soviet regions, where prevailing wages are probably higher than in China, say that Chinese laborers are paid meager wages, are living in unsanitary work camps, and are dressed in rags. In this case, the use of cheaper Chinese labor is dragging down the wage rate for local workers. This, more than other issues, seems to be generating resentment from the population of many countries.¹²

Chinese-financed projects are generating a lot of employment for both Chinese and local people. There are currently around 200,000 Chinese workers in Africa. Chinese companies often expect levels of labor commitment higher than companies from other countries, and tend to pay less, and this is passed on to local labor. While Chinese companies use less local labor than companies from other countries, Chinese companies do use a significant amount of local labor. In Ethiopia, which places limits on the amount of expatriate labor that can be used, about 90% of the labor in Chinese companies is Ethiopian, and in countries like Angola without such laws, it is about 75%, with a continent-wide average of about 85%.

As wages rise in China, the tendency to use more local labor is increasing.¹³ Nonetheless, Chinese ECAs will need to be more cognizant of the local impression that their labor practices have on their reputation and establish exemplary labor standards.

¹¹ Goodfellow and Huang, op. cit. p.666.

¹² DiCarlo, J. 2020. “Mind the Gap: Grounding Development Finance and Safeguards through Land Compensation on the Laos-China Belt and Road Corridor; Boston University Global China Initiative Working Paper 013. Interview with the ADB <https://chinaafricaproject.com/podcasts/the-bitter-life-for-chinese-migrant-workers-in-ethiopia/>

¹³ F. Chiyamura. “Chinese firms – and African labor- are building Africa’s Infrastructure. Washington Post. April 2, 2021. <https://www.washingtonpost.com/politics/2021/04/02/chinese-firms-african-labor-are-building-africas-infrastructure/>

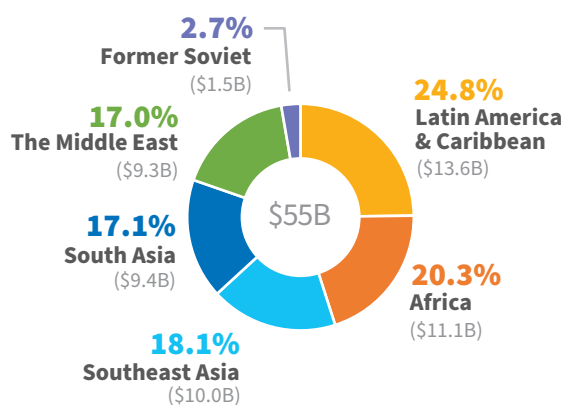
Case Studies of Chinese Investments into Rail, Roads, and Public Transit

The problems described in Chapter 3 have been observed in a number of Chinese investments internationally. This chapter provides an on-the-ground look, mode by mode, at how these challenges have manifested themselves in specific projects, and how many of the pitfalls could have been avoided in each case.

Inter-city rail megaprojects

The projects which caused the biggest debt problems and crowded out lower cost, higher impact investments, were mostly the intercity rail projects. While the lending was fairly evenly dispersed between Africa, former Soviet countries, Latin America (mostly Argentina), and Southeast Asia, the rail projects that had the most significant debt impacts were those to Africa.

Figure 32. China's intercity rail lending by region, 2010 – 2018



The loans to intercity rail in Africa were of such a size in relation to the countries' economies, and were such large-scale financial failures, that the loans themselves became central to those countries' debt crises.

In 2013, Kenya, Uganda, and Rwanda joined together to form the Northern Corridor Integration Project (NCIP). South Sudan joined in 2015. Ethiopia, Tanzania, Burundi, and the DR Congo also participate as observers. The

purpose is to coordinate international infrastructure development initiatives aimed at promoting regional connectivity.

One such initiative is the Standard Gauge Railway (SGR) project. East African railroads, including those in Ethiopia, Kenya, Uganda, and Tanzania, were all originally built at narrow gauge (1 meter) during the colonial period. Most of these railways are badly deteriorated and many have stopped operating altogether. Reasonably, since all the modern major manufacturers of rail equipment use standard gauge (1.435m), the leaders of the NCIP, and the observers, initially agreed to convert to standard gauge.

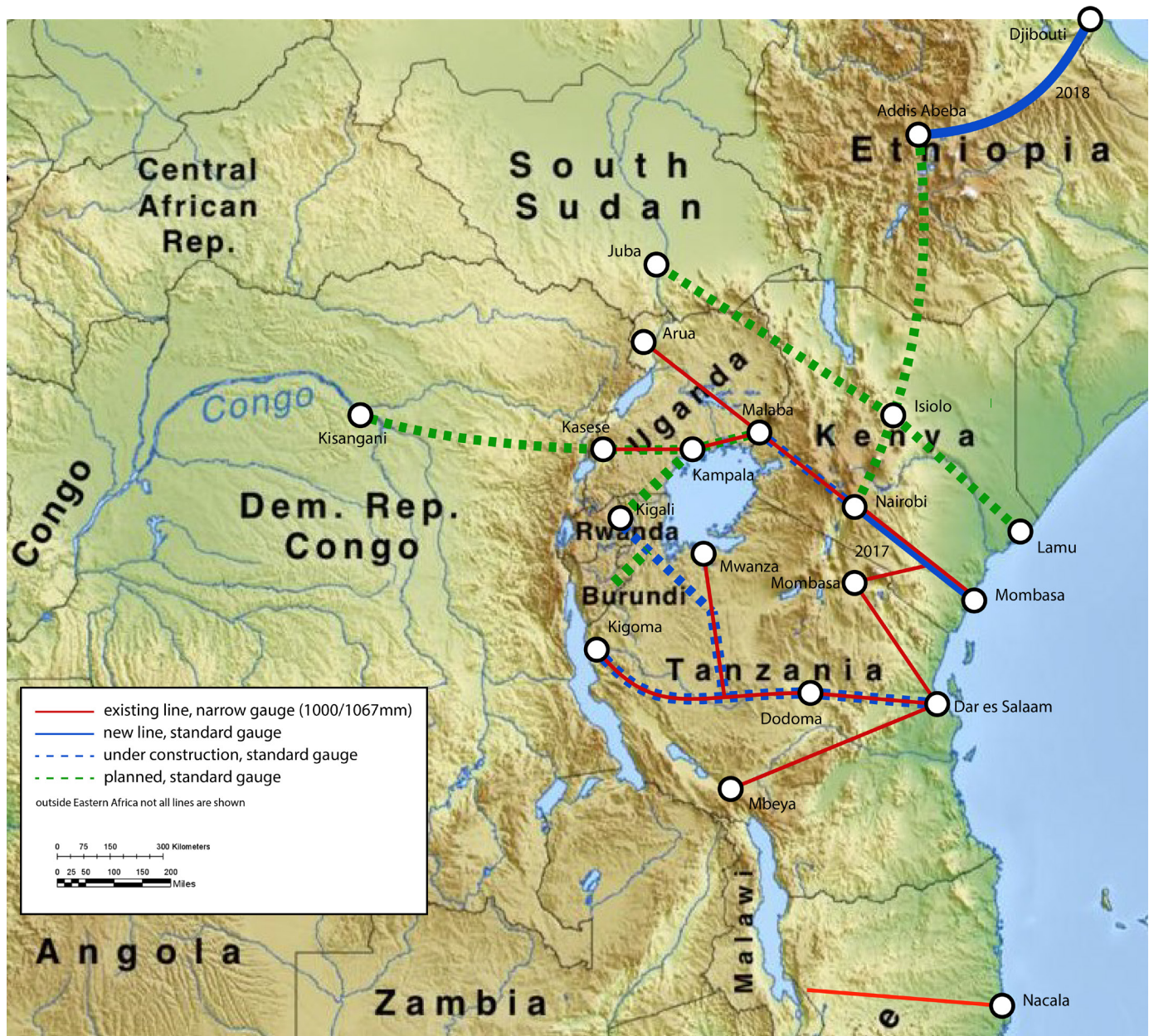
For international railway links in East Africa to become economically and financially feasible, the country on the other side of the border must also build a railroad of the same gauge to meet it, and the border crossing issues must be sorted out, so the coordination among the countries was encouraging to donors.

China's Rail Rollingstock Corporation (CRRC) is the world's largest manufacturer of rail equipment, and China's largest construction companies have experience building railways, so China has a competitive advantage for its firms in railways.

China's CHEXIM stepped forward to become the predominant lender for many of the East African projects, although the Turkish Exim Bank is involved in a few, and the MDBs have also expressed interest. The links between major cities and ports are being built first, while the international connections will come later.

“China's loans to intercity rail in Africa were so large, and such financial failures, that the loans were central to a new debt crisis.”

Figure 33. Map of proposed Northern Corridor Integration Plan



Source: [Classical geographer](#) (Wikimedia Commons) CC BY-SA 4.0

Kenya is the single largest recipient of Chinese railway loans in East Africa. The Malaba–Nairobi–Mombasa Railway is the single largest project and has already received at least \$5.09 billion in Chinese loans. Ethiopia received at least \$2.9 billion for the Addis-Djibouti Railway, while Djibouti received another \$492 million. The costs of the projects escalated so the precise loan amounts are unknown. Tanzania signed a \$1.32 billion contract in January of 2021 with two Chinese companies to construct the second phase of the Dar es Salaam – Mwanza railway, though it is not yet clear who is financing it. Uganda and

Rwanda have yet to borrow money for railways, though Uganda has been in negotiations since at least 2018, and a deal with Uganda was recently announced.¹⁴

The possibility of China financing the integration of the East African economies by rail for the first time in history is exciting and potentially transformative. A functioning rail system would keep millions of tons of heavy freight off of African roads, with potential economic and environmental benefits. East Africa had been growing robustly for a decade and the time seemed right for some transformative south-south economic cooperation. In all the

¹⁴ Otiatio Opali, “Uganda Seals Deal to Rehabilitate Malaba-Kampala Railway,” *China Daily*, May 20, 2021. <http://www.chinadaily.com.cn/a/202105/20/WS60a614c9a31024ad0bac0545.html>

years of support from the MDBs and the OECD countries to East Africa, little progress had been made to knit these economies together and link them to the global economy, so China's role in making this vision approach reality is exciting. Their comparatively low construction costs were what made this possible.

Unfortunately, along the way, this bold vision has encumbered several of these countries with debts that threaten their economic growth in the years ahead.

Ethiopia

The Addis Ababa–Djibouti railway is a segment of a planned Trans-East Africa Railway, but it is not slated to connect to the railways in Kenya or Sudan for years into the future. The railway was built as a standard gauge, with most of its rolling stock electric. While an old narrow-gauge railway previously existed in this corridor, the new standard gauge railway was built on a different alignment. The loans were approved in 2013, and the railway was completed in 2018, which is impressive speed for a major project in Africa.

Figure 34. Addis-Djibouti Railway



Source: Skilla1st (Wikimedia Commons)

While CHEXIM's loans totaled around \$2.5 billion, total project costs escalated to over \$4.5 billion. The financial performance, however, has been poor. In 2019, its freight service earned about \$38.8 million and its passenger service earned \$1.2 million, but the railroad costs about \$70 million per year to operate, before including the infrastructure and rolling stock investment.¹⁵ The passenger service is barely functional, operating only once every two

days pre-Covid, and since the pandemic, only once every four days. The service carries only 84,000 passengers per year, less than most urban rail lines carry in a single day.

Both Ethiopia and Djibouti sought and received a rescheduling of the debt, mainly extending the repayment schedule. Sinosure, which frequently insures CHEXIM debt, has already lost \$1 billion on the deal.

The economic crisis related to Covid-19 has worsened matters, and the Tigray War has further led to an overall economic contraction; however, the project was in trouble even before the pandemic and the war.

In retrospect, the decision to electrify the railway line was a big gamble that didn't pay off. From the perspective of the Ethiopian government, which pushed for electrification, it seemed to make sense. Ethiopia is building a new dam on the Blue Nile (the Grand Ethiopian Renaissance Dam) that it is hoped will make electricity in Ethiopia cheap and plentiful. The dam has been mired in controversy¹⁶ and remains unfinished. The existing power grid is neither sufficient nor reliable. Since the railway began operation, there have been 6,478 power outages, including 1,736 incidents on the rail power lines themselves. This has resulted in 48,000 hours of service disruption. The average time required to fix the problem is 3 hours, with it sometimes taking more than a day for power to return. This can sometimes happen when a train is on a slope, creating dangerous operating conditions.

Complicating matters, there have also been 573 incidents of theft reported. Equipment has been stolen, as well as rail fastenings which creates a risk of derailment. There have been costly derailments. There has also been a problem with maintenance of the locomotives. In 2019, eight of the 35 electric locomotives, and two of the six diesel locomotives were out of service because of lack of ongoing maintenance or supply of spare parts.¹⁷ All of these problems have been extremely damaging to the Ethiopian industries that rely on the railway for freight movement.

Experts say that a lot of the critical infrastructure necessary for transshipping between the railway and port or trucks appears to be missing. On the passenger side, overbuilt railway stations sit on the outskirts of Addis Ababa, Dire Dawa, and the city of Djibouti, far from town centers. Even if the service were reliable, passengers need to transfer to another mode for the last 10 km or more of their journeys, so most choose to just take a minibus for the entire trip. While there are plans to connect both the Addis Ababa BRT Line 2, and the LRT to the railway station, neither of these extensions are near completion.

¹⁵ B. Fikade. "Power disruptions hobble Ethiopia's Railway Lines" The Reporter: Ethiopia. Dec. 28, 2019. https://www.thereporterethiopia.com/article/power-disruptions-hobble-ethiopias-railway-lines?__cf_chl_jschl_tk__=p-md_07dd90386b8db0bf17a042a227073a4f79df8693-1626537612-0-ggNtZG-zNAiKjcnBszQbi; Wikipedia, Addis Ababa - Djibouti Railway: https://en.wikipedia.org/wiki/Addis_Ababa%E2%80%93Djibouti_Railway

¹⁶ John Mukum Mbaku. "The controversy over the Grand Ethiopian Renaissance Dam," Brookings Institution, August 5, 2020. <https://www.brookings.edu/blog/africa-in-focus/2020/08/05/the-controversy-over-the-grand-ethiopian-renaissance-dam/>.

¹⁷ B. Fikade, op. cit.

“While it would have been more difficult to build railway stations in city centers, the success of passenger rail depends on it.”

Parts of China’s bureaucracy is clearly aware of the problem:

“Wang Wen, the chief economist at Sinosure, said the planning behind many of China’s major infrastructure projects abroad had been ‘downright inadequate,’ leading to huge financial losses. ‘Chinese developers and financiers of projects in developing nations need to step up their risk management to avoid disaster. We can clearly see the mistake that has happened on the Addis-Djibouti Railway line, which has since cost Sinosure \$1 billion,’ Mr Wang said.”¹⁸

In retrospect, while the choice of corridor was reasonable, electrifying the line was premature. As a minimum, a larger share of the fleet of locomotives should have been diesel. In addition, it would no doubt have been cheaper to replace the old narrow-gauge railway with standard gauge but on its old alignment. Further, while it may have been more expensive to build stations in the city centers, the passenger rail cannot be profitable otherwise. A detailed financial analysis could have better elucidated these costs and benefits.

China is not the only country to find misadventure in Ethiopian rail loans. The other modern national railroad, between Awash (on the Addis-Djibouti Railway) and Weldiya (en route to the Tigray capital) received a loan for \$1.16 billion from an EU-Turkish consortium. This railroad, which is nearly complete but not yet operational, began construction in 2015 and was supposed to be finished in 2017, with stiff penalties for non-completion within three and a half years (2018). It is still not operational and faces even more dire economic prospects. Not being operational, it brings in even less revenue than the Addis-Djibouti Railway and serves an area currently facing civil war. The quality of the construction is said to be somewhat better than on the Addis-Djibouti line (it uses continuous casting on its rails), and the locomotives are interoperable between the two lines, but the signaling systems are not, which will create complexity for interoperability.

¹⁸ Kenya fails to secure \$3.6 billion from China for third phase of SGR. The East African, Apr 27, 2019. <https://www.theeastafrican.co.ke/business/Kenya-fails-to-secure-loan-from-China-for-third-phase-of-SGR/2560-5090192-2o0y9j/index.html>

Figure 35. Furi Lebu railway station, outskirts of Addis Ababa



Source: CREC

Kenya

Mombasa-Nairobi Standard Gauge Railway

The new \$3.6 billion standard gauge railway between Mombasa and Nairobi was completed in 2015. The Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works in Kenya claims that the system was expected to turn a profit within a few years, but in the first three years of operation it lost \$200 million, with operating costs of \$430 million and revenue around \$230 million.¹⁹ This was before Covid-19. Before the pandemic, freight traffic was picking up on the railway, but since the pandemic, it has been losing about \$9 million a month. In the summer of 2020, Kenya defaulted on a \$350 million debt payment for the loan. Kenya is in negotiations for rescheduling the debt.

In 2014, the World Bank funded a study on the East African Railway in Kenya where four alternatives were considered.²⁰

1. Rehabilitate the existing narrow-gauge railway, at \$0.18 million/km;
2. Modernize the existing railway using narrow-gauge, at \$0.5 million/km,

¹⁹ C. Mureithi. “Kenya’s expensive Chinese-built railway is racking up losses even as loans fall due” Quartz, Africa. May 3, 2021. <https://qz.com/africa/1915399/kenyas-chinese-built-sgr-railway-racks-up-losses-as-loans-due/>

²⁰ World Bank 2013. *The Economics of Rail Gauge in the East Africa Community*. Washington DC: World Bank-Africa Transportation Unit. <https://africog.org/wp-content/uploads/2017/06/World-bank-Report-on-the-Standard-Gauge-Railway.pdf>

3. Transition to standard gauge on the existing rail right-of-way, at \$1.5 million/km; or
4. Create an entirely new standard gauge railway on a new alignment, at \$3.25 million/km.

This economic appraisal concluded that there was not enough rail freight demand to justify the conversion to standard gauge even on its own alignment (Option 3), let alone what Kenya did, with China's backing, which was to build an entirely new alignment (Option 4).

The decision to change to standard gauge was made at the regional level and given that most railway rolling stock manufacturers produce for standard gauge, it seemed a reasonable decision. Less clear, however, was the economic justification for building it along an entirely new alignment. As the decision-making process was non-transparent it is not clear why the new alignment approach was selected by the Kenyan government.

The freight railway brings freight from the Port of Mombasa to an intermodal terminal far from Nairobi, so all freight going from Mombasa to Nairobi must be moved onto a truck outside of Nairobi for the final trip into Nairobi. When these combined costs are added together, it is cheaper to simply truck the goods the entire way.

Additionally, the railway does not have the capacity to carry the amount of freight that would allow it to earn a profit.

Passenger rail makes little more sense. The passenger terminals are far from downtown Nairobi and far from downtown Mombasa. After factoring in local transport, it is much faster and not much more expensive to simply fly.

Evidently, the only feasibility study done on the project by China did not include a financial evaluation, only an assertion of 'financial accumulation ability'. The economic appraisal estimated the net present value as high as \$2.6 billion, but this is well below the \$3.2 billion in lending it cost to construct. If any economic or financial appraisal was done by CHEXIM, it has not been made public.²¹

Leading Kenyan economists who evaluated the project's financial feasibility raised serious questions about the project's viability from its inception. In short, it does not seem like the project would have survived an MDB economic appraisal.

“Construction of a standard gauge link from Nairobi to Naivasha should not have proceeded until there was an agreement by Uganda to build the Kampala link in standard gauge.”

Nairobi-Naivasha Rail Line

If the railroad between Mombasa and Nairobi was having trouble, the railroad between Nairobi and Naivasha made even less sense. The Nairobi-Naivasha link is a small piece of what was one day to be a longer railway linking Nairobi with Kampala, the Ugandan capital. The Nairobi to Naivasha link was completed in 2019 with the help of a \$1.5 billion loan from CHEXIM.

For the railway between Nairobi and Kampala to make sense, Uganda would need to build the link from the Kenyan border to Kampala in standard gauge. There is typically a huge back-up of trucks at the Kenyan – Uganda border (Uganda is also land-locked), so there is clearly freight demand, though the bottleneck may be more related to customs processing than the highway infrastructure. Thus, there might be demand for the rail link if Uganda and Kenya both built their sections, the border issues could be sorted out, and the railroad proves competitive with trucking alternatives. Formal requests from Kampala to build this link came only after China had gotten burned by its loans to Kenya and Ethiopia, and China only agreed to proceed if the loan could be secured by oil revenues from oil wells that Uganda is developing, and Uganda refused to accept these terms.²² When this deal fell apart, the economic case for the link between Nairobi and the Ugandan border collapsed.

As a result, in 2019, China cancelled the loan to finish the Kenyan SGR to the Ugandan border.

Most recently, given the economic difficulties, it seems that both Kenya and Uganda are planning instead to upgrade the existing narrow (1 meter) gauge railway between Naivasha and Kampala. This means that any shipment going by rail from Nairobi to Kampala will need to be transferred from SGR to narrow gauge at Naivasha.²³

²¹ Ndii, D. “SGI by the numbers: some unpleasant arithmetic” The Elephant, July 21, 2018. <https://www.theelephant.info/op-eds/2018/07/21/sgr-by-the-numbers-some-unpleasant-arithmetic/>

²² “Uganda declined China request to repay sgr loan with oil cash,” The Independent. <https://www.independent.co.ug/uganda-declined-chinas-request-to-repay-sgr-loan-with-oil-revenue/>

²³ Otatio Opali, “Uganda Seals Deal to Rehabilitate Malaba-Kampala Railway,” China Daily, May 20, 2021. <http://www.chinadaily.com.cn/a/202105/20/WS60a614c9a31024ad0bac0545.html>

Clearly construction of a standard gauge link from Nairobi to Naivasha should not have proceeded until there was an agreement by Uganda to build the Kampala link to the Kenyan border in standard gauge.

South Africa

Loans to South Africa for the purchase of Chinese locomotives embroiled China in a high-profile corruption scandal. Over \$1.5 billion in loans from the CDB, the Bank of China, and ICBC to South Africa's freight railway Transnet, which later escalated by another \$1 billion, have been mired in controversy. The loans were for hundreds of freight locomotives to be supplied by CRRC.

On the face of it, South Africa indeed needed new locomotives. Its economy is heavily dominated by mining, which depends on rail. Its power sector is dominated by coal, which is also shipped by rail. Their aging fleet of locomotives needed modernizing and expansion to move as much of this heavy freight off the road as possible.

The loans were made under Jacob Zuma, the former President, who has since been jailed for corruption. Under Zuma, the Gupta family, which had close ties to Zuma, 'captured'²⁴ several state agencies including Transnet, a large South African state-owned enterprise involved in rail, port and pipeline operations. An investigation by the State Capture Commission of Inquiry found irregularities in the Transnet locomotive deals. An estimated 21% of the contract value was found to be routed to Gupta-owned shell companies. The Guptas have since fled the country. The locomotives were also delivered late and were reportedly of poor quality.²⁵

*"At the inquiry, a former strategic manager at Transnet also described how Molefe unilaterally rejected his team's recommendation to buy Japanese locomotives designed for hauling coal, and instead favoured CSR [later acquired by CRRC – the China Railway Rolling Stock Corporation], even though its locomotives were not entirely suitable for that purpose. [The CSR locomotive in question was] not designed for the coal line,' Francis Callard said."*²⁶

CRRC was not acting alone. The contracts had local content requirements, and these elements of the contract were handled by partnerships with Bombardier and General Electric.²⁷

In conclusion, China's large rail sector loans seem to make general economic sense in larger countries that already have an established and competitive rail industry. In countries where the rail industry needs to be built up virtually from scratch, Chinese policy banks seem to have underestimated the costs of bringing these services online and overestimated the ability of the government to pay for it. Meanwhile, lack of transparency in several deals made with leaders, some of whom have since been ousted or imprisoned, tarnished China's reputation.

Road sector megaprojects

China's road lending played a smaller, but still significant, role in the debt problems of a few deeply indebted countries. In a few countries where China has deep economic ties, loans have funded almost everything in the road sector. In other countries, China has focused primarily on high-profile toll roads. In both cases, Chinese road sector loans have contributed to national debt problems, but not to the same degree as their railway loans, and again China was not the only international lender involved.

China has long and deep economic ties with Angola. China's ECAs have provided \$3.15 billion in loans for a wide range of road investments, from municipal road upgrading to intercity highways. Other countries have also received large scale financing for a wide variety of road projects from China's ECAs, including Sri Lanka (\$2.86 billion), Zambia (\$1.9 billion), Cambodia (\$1.25 billion), and the Democratic Republic of the Congo (\$333 million). In these countries, China is lending for extensive road rehabilitation and upgrading, as well as new highways. While the quality of these investments is difficult to judge, they clearly contributed to significant debt problems in Angola, Sri Lanka, Zambia and the DRC.²⁸

²⁴ The term "state capture" was first coined by the World Bank to describe systematic corruption where a state agency's primary function is to divert public resources into the hands of private profiteers.

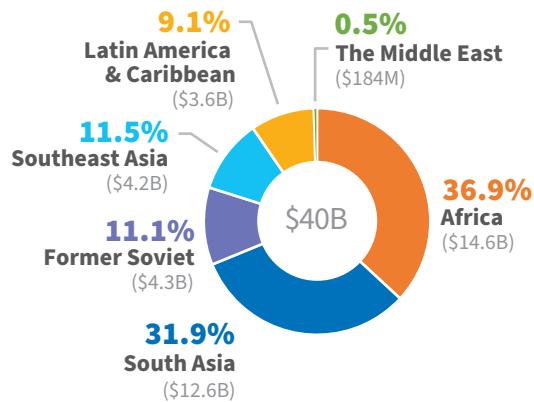
²⁵ O. Secrets. "The Chinese Railway Rolling Stock Corporation: China Inc. Boards the State Capture Train." Daily Maverick. March 30, 2021. <https://www.dailymaverick.co.za/article/2021-03-30-the-chinese-railway-rolling-stock-corporation-china-inc-boards-the-state-capture-train/>

²⁶ C. Erasmus. "Chinese rail deal under scrutiny in state-capture corruption probe." *South China Morning Post*. June 9, 2019. <https://www.scmp.com/news/world/africa/article/3013712/chinese-rail-deal-under-scrutiny-south-africa-state-capture>

²⁷ W. Roelf. South Africa's Transnet mulls lifting Chinese engine contract suspension. Reuters. Sept. 10, 2020. <https://www.reuters.com/article/ozabs-uk-safri-ca-transnet-trains-idAFKBN2611JZ-OZABS>

²⁸ Transport project preparatory facility RRP SRI 44350 "Development Coordination: Major Development Partners Asian Development Bank. <https://www.adb.org/sites/default/files/linked-documents/44350-013-dc.pdf>

Figure 36. China's road sector lending by region, 2010 – 2020



In other countries, China has tended to finance high profile intercity highway and toll road megaprojects. These projects include reasonable links between major cities that other donors also clearly support, where China has performed admirably, delivering the project quickly and at reasonable cost. They also include more economically dubious projects with more geopolitical, than economic, justification.

Ethiopia

Ethiopia borrowed \$867 million from CHEXIM for inter-city highways. These funds went to:

- **Toll roads:** Addis Ababa–Adama Expressway and Dire Dawa-Dewele Toll Road,
- **Urban roads in Addis Ababa:** Inner and outer ring roads, critical interchanges, airport road
- **Mombasa-Nairobi-Addis Ababa road corridor:** also being financed by the World Bank, the AfDB, and Korean ExIm.

Toll roads

China loaned Ethiopia about \$350 million in 2013 for the Addis Ababa–Adama Expressway. It was already finished by 2014. After 5 years it has earned back only about \$30 million in toll revenue, well short of expectations. Ethiopia built the toll road parallel to an existing free highway, and a lot of the traffic has remained on the old road. As such, the road has contributed to Ethiopia's indebtedness. However, it should be noted that most roads are not constructed as toll roads, and thus are even less likely to pay for the cost of their construction.

Ethiopia does have a road fund which is intended to be used for road maintenance. According to the World Bank, however, currently the road fund only receives about 50% of what is needed to maintain the existing roads, let alone pay for any new road construction and maintenance. As such, unsustainable toll roads as well as non-toll roads are contributing even more to the level of debt.²⁹

The other toll road in Ethiopia is the \$187 million Dire Dawa-Dewele Toll Road, which connects the town of Dire Dawa to the Djibouti border crossing. It opened in 2019 but was formally inaugurated only in 2021 so there is no revenue data yet. It cut travel times between Dire Dawa and the Djibouti border dramatically. Thus far, there is not much traffic on the road, which leads through the desert and has almost no services or other urban settlements along it. This highway could become financially viable by providing a faster link between Addis Ababa and Djibouti, but only when the missing sections between Adama-Awash-Mieso-Dire Dawa are built. While the AfDB and the WB are preparing financing for some of these missing sections, Chinese financing of the Dire Dawa-Dewele section was premature.

Urban roads in Addis Ababa

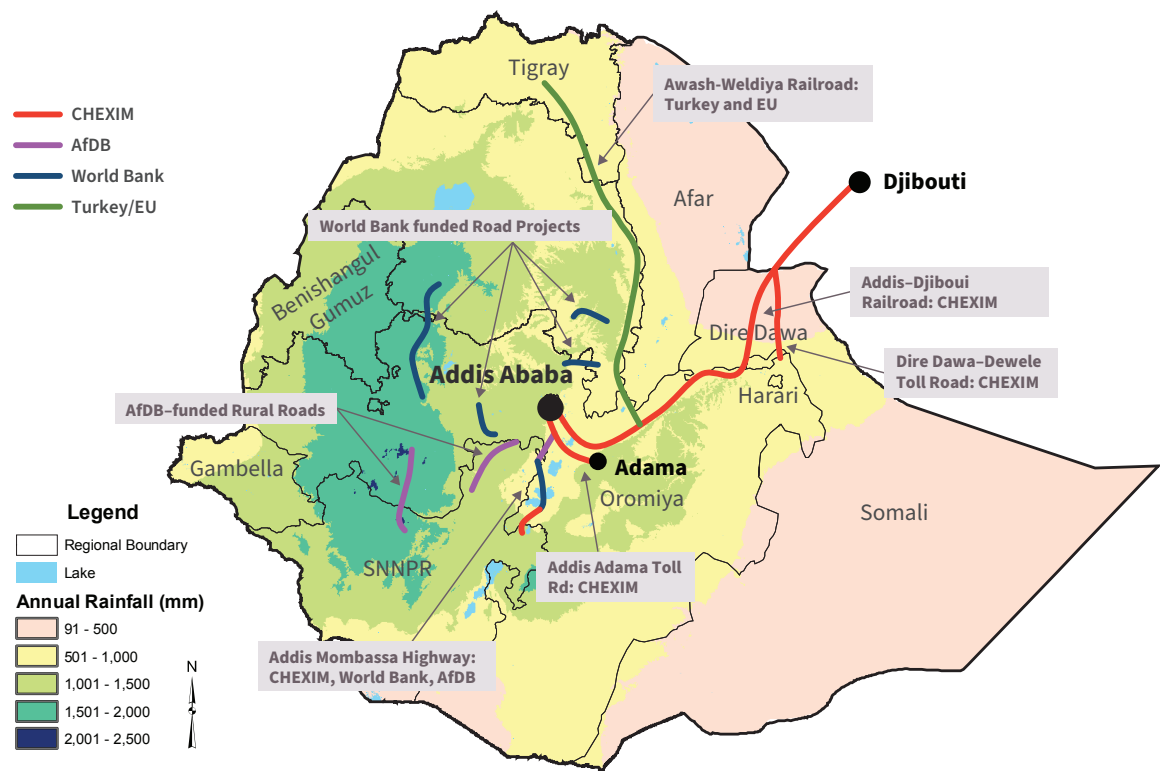
China has been heavily involved in the development of the Addis Ababa road network since 1998. Addis Ababa is urbanizing rapidly, and the city is quickly sprawling around new urban highways. China's first involvement was the Addis Ababa Ring Road. China Road and Bridge Corporation (CRBC) won a competitive tender by the Addis Ababa City Roads Authority (AACRA) worth about \$86 million for a 32km ring road already back in 1998. CRBC did not design the road, it was planned by AACRA and designed by British engineers under contract to AACRA.³⁰

The road was designed with a highway cross-section appropriate for long distance travel. It had limited facilities for cyclists, pedestrians, no dedicated facilities for public transit, and was difficult to cross. The road is heavily utilized and appreciated by motorists. At the time of its construction, most of the road was on the edge of the city limits. Nonetheless, when the road was built there was considerable acrimonious resettlement of small farmers, handled by the Government of Ethiopia. Very rapidly, the city grew up along the road, and the highway-style road helped inaugurate an automobile-dominated urban form with non-motorized trips between neighborhoods severed by the high speed and dangerous roadway.

²⁹ Expressway Development Support Project, 2015. World Bank. PAD1135.

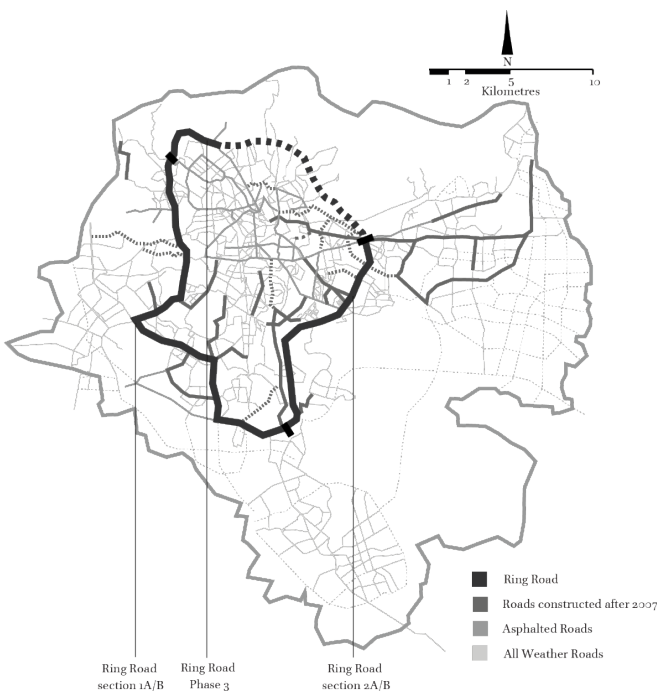
³⁰ Peng Mo, Ryan Orr, and Jianzhong Lu, "Addis Ababa Ring Road Project: A Case Study of a Chinese Construction Project in Ethiopia," *International Conference on Multinational Construction Projects, Securing High Performance through Cultural Awareness and Dispute Avoidance*, Shanghai, China, November 21-23, 2008.

Figure 37. Map of major transportation investments in Ethiopia by donor agency.



Source: UN OCHA 2006 with project labels by the author

Figure 38. Addis Ring Road, financed by China



Source: Delz, Sascha. (2018). Towards an Integrative Approach to Spatial Transformation: Addressing Contextual and Spatial Indifference in Design, Urban Planning and International Cooperation: A Case Study from Addis Ababa. *Revue internationale de politique de développement*. 10 | 2018. 188-212. 10.4000/poldev.2695.

Today the road is being re-engineered in a manner more appropriate to an urban arterial, and while China did not play much of a role in the re-design, Chinese construction companies are also bidding on those tenders. Thus far, the new designs are still car-oriented, building inconvenient pedestrian overpasses rather than at-grade intersections that would be easier for pedestrians and cyclists to cross, but things are generally improving.

Figure 39. Efforts to retrofit the Ring Road with pedestrian overpasses are something of an afterthought, expensive, and inconvenient for pedestrians



Source: Addis Ababa Traffic Management

More recently, CHEXIM financed the Outer Ring Road that connects the Addis Ababa – Adama Expressway to the eastern part of downtown Addis. When the land for this road was taken, they took 60 meters of right of way so that if they needed to widen the road they would not need to again go through the land acquisition process. A large median has been left for future widening, but it could also be used for future BRT, as it is the location of planned BRT Corridor B12. Anticipating the rapid urbanization that is indeed occurring along the road, the road has been designed with much better pedestrian facilities than the inner ring road, but it is still a high speed road that is very difficult to cross.

Figure 40. The recently constructed Outer Ring Road financed by CHEXIM includes nice sidewalks along it in anticipation of future urbanization of the corridor.



Source: CCCC

CHEXIM also invested \$103 million into two highway interchanges connecting the Outer Ring Road with the Addis Ababa-Adama Expressway. These do not appear to have accommodated pedestrians and cyclists and no doubt contribute to severance problems.

By contrast, a new three-way flyover, the Gotera-Pushkin Square interchange, is being built to accommodate three planned BRT lines that all intersect there, the B2 (under construction with AFD financing), B3 and B6 (also under construction with Korean ExIm financing), as well as decently integrated facilities for non-motorized travel. This is being financed by China's Agency for International Economic Cooperation within China's Ministry of Commerce, with an interest-free loan.

Chinese engineers do not appear to have played a significant role in the conceptual design of the interchange. The BRT facilities that have been incorporated into the design have largely been designed by the consultants to the AFD, with input from ITDP Africa, and the main role of the Chinese firm building the road was to follow the designs made by other consultants.

The trajectory indicates significant improvement on the part of Chinese-financed urban road projects over the course of the decade, with considerable progress still to be

“If China and the MDBs had improved the existing highway and added bypass roads, rather than building an entirely new highway, they could have allowed long-haul trucks to bypass the towns, while also improving traffic conditions and road safety in the towns along the way.”

made, but this improvement appears to result primarily from the increasing sophistication of the Ethiopian government authorities rather than from any push from the Chinese ECAs or Chinese companies.

The Highway between Addis Ababa and Mombasa (Arsi Negele to Hawassa Section)

The highway from Arsi Negele to Hawassa is a piece of the Mombasa to Addis Ababa road corridor financed by CHEXIM. Other sections were financed by the AfDB, the Korean ExIm Bank, and the World Bank. The entire road is planned as a toll road. The road is not finished so its financial impacts are not known.

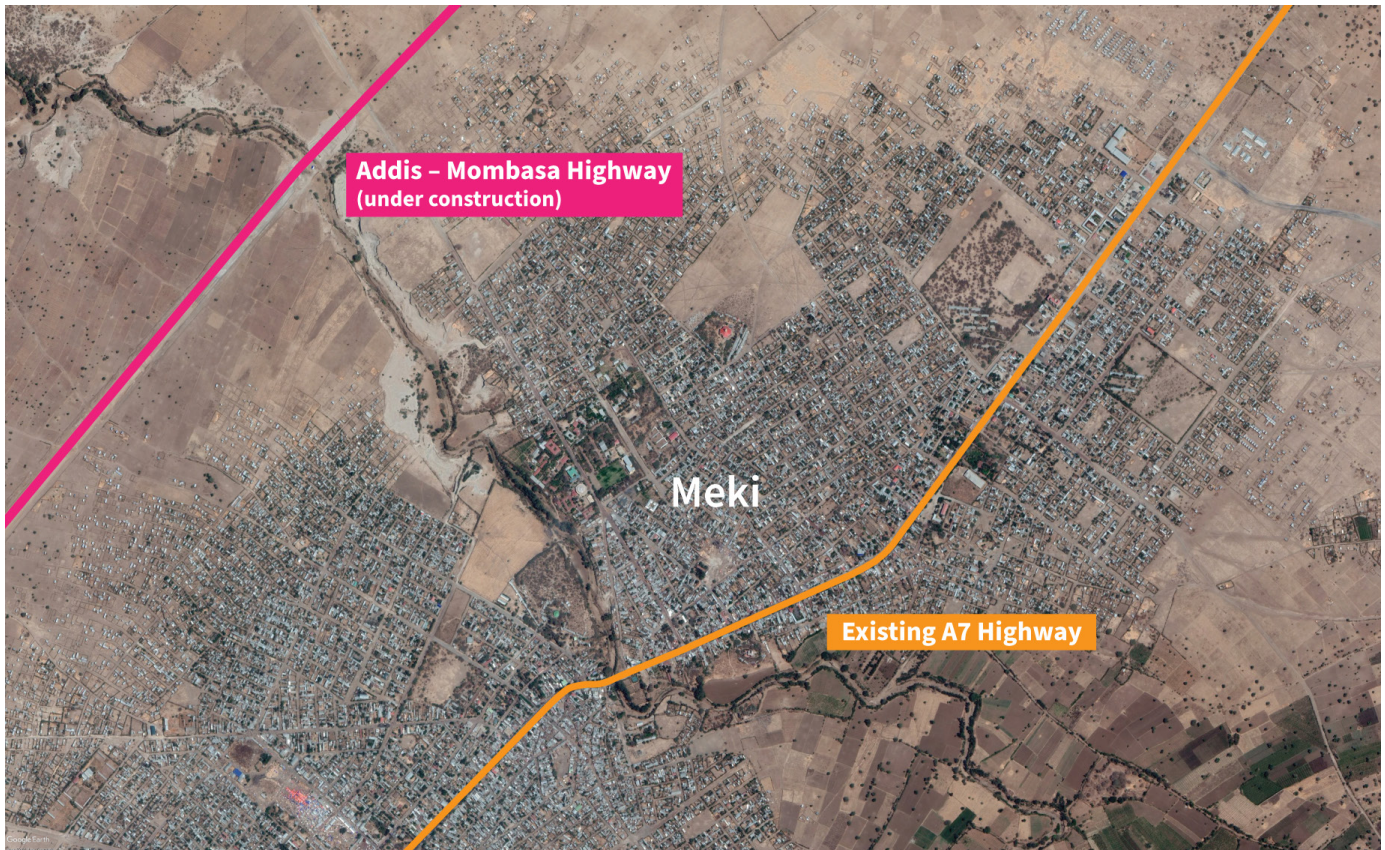
As with the Addis Ababa–Adama Expressway, the new road parallels the old road. While the old road goes from town to town, passing through them, the new road is on a new right of way quite distant from any of the towns that the old highway connects.

The World Bank did an alternatives analysis which considered an alternative to upgrade the old road where it is, while building bypass roads around some of the towns the highway passes through.

The alternatives analysis showed the option to improve the old road to be superior to the new road alternative. Nonetheless, the World Bank recommended the new road, giving the following reasons:

“The widening of the existing road to dual carriageway standard (Option 3), the lowest-cost option, comes at a very high social cost and safety risk. Animal drawn carts and pedestrians heavily use the existing road, requiring separate lanes on both sides for non-vehicular traffic use. When

Figure 41. New Highway between Addis Ababa and Kenya on a new alignment (left); Old highway, at Meki, Ethiopia (right)



Source: Google Earth satellite image (Maxar Technologies), labelled by the author.

the cost of the additional lanes is added, the total cost of the construction could be similar to the other options. Bypasses would constrain the future expansion of the towns and give rise to high resettlement requirements that makes this an undesirable option.”³¹

In fact, if the Addis Ababa-Adama Expressway is any indication, much of the traffic is likely to remain on the old road which is free of charge and goes more directly to likely destinations. The old road will be left to deteriorate, and the main safety problems will remain unaddressed. Meanwhile, the new toll road which bypasses all the towns along the way, will serve only long-distance trips by wealthy motorists and trucking companies. If they had rebuilt the existing road with bypass roads, they could have pulled the trucks out of the towns while also spending some of the money improving the traffic conditions and the road safety in the towns along the way.

Furthermore, the project PAD says the following:

“Service providers in smaller towns along the existing road would consider they will lose business.”³²

Indeed, building a new road that entirely bypasses a town, even a bypass road, can sometimes have adverse consequences for the town’s economy.

In this case, China’s ECAs do not appear to have been in the lead. Rather, the project seems to have been led by the AfDB and the World Bank, with China coming in to finance a segment.

Rural Roads and Maintenance

China has not focused on rural roads. The World Bank and the AfDB, by contrast have spent a lot on rural roads. These rural roads may do more from a poverty alleviation perspective, but they have relatively light traffic so their economic and financial impacts may be worse than the projects financed by China’s ECAs. They are also harder to monitor. Based on Google Earth, about half of the rural roads financed by the World Bank appear to have been built, while we could not find any visual evidence that the rural roads financed by the AfDB were built.

³¹ Expressway Development Support Project, 2015. World Bank. PAD1135, p. 15.

³² Expressway Development Support Project, Op. Sit.

The World Bank has also put a lot of effort into improving road maintenance with some success. Nonetheless, the Ethiopian Road Fund typically receives about \$65 million in revenue every year, but to maintain even the road network it currently has in a state of good repair requires \$100 – \$150 million a year. The ECAs and MDBs therefore need to push Ethiopia to raise more revenue from road users to ensure that the new infrastructure being built is properly maintained.

In summary, China's intercity road loans to Ethiopia have fared poorly financially. The toll roads did not earn as much revenue as anticipated and contributed to Ethiopia's debt problems. Chinese lending would have done better to upgrade the existing highways on their existing alignments, while building bypasses around the major towns. This would have been cheaper and had more beneficiaries. The money could have been recouped through increases in fuel taxation or tolling of these existing roads.

China was hardly alone in these issues, however. Some of these roads were co-financed by the MDBs, and other road loans from the MDBs also contributed to Ethiopian debt.

The Chinese-financed roads around Addis Ababa seem to be carrying extensive traffic and hence appear to be reasonable from a short-term economic perspective. The initial set of urban road loans, however, contributed to a car-oriented urban environment, doing little for more sustainable modes of travel and severing adjacent neighborhoods. However, significant improvement is seen in more recent Chinese loans, where BRT and better NMT facilities are being integrated into the projects, mostly at the initiation of the Government of Ethiopia.

Kenya

In Kenya, China has focused its efforts on urban roads in Nairobi. Traffic congestion is terrible in Nairobi, so many of the projects have been welcomed by the public, though they have done little to improve public transportation, safety for pedestrians and cyclists, and public space. As in Ethiopia, the Government of Kenya has been sensitized to the possibilities of BRT and non-motorized transport by NGOs and supportive development banks.

Thika Highway

The first major highway to be built in Nairobi using Chinese loans was the Thika Highway. The most sensitive part of the highway – the part that enters downtown Nairobi – was financed by the AfDB. China built the section on the outskirts of Nairobi from the Kenyatta University to the industrial town of Thika. This road was intended to have BRT on it, but the BRT was never built, and the AfDB never insisted, nor did China. Today, the Government of Kenya is

retrofitting the road with BRT, but it is of poor quality and movement has been extremely slow as there is no longer any foreign finance involved. There is a discontinuous bike lane along the highway, but crossings are few and difficult. The highway has no special amenities for minibuses or buses, despite being in the center of Nairobi.

Southern Bypass

China's next major project in Nairobi was the Southern Bypass. This road is working reasonably well from a transportation perspective. For the most part it doesn't pass through built-up areas so its design as a limited access freeway caused fewer severance problems for the surrounding community. It was controversial with environmental groups for being built on a small piece of Nairobi National Park, and a very large section of the Ngong Road Forest Sanctuary. The road has no amenities for rapid transit, cyclists, or pedestrians who are often seen walking on the road, but it is heavily used.

Figure 42. Nairobi Southern Bypass was built through the middle of the Ngong Road Forest Sanctuary, and along a small strip of Nairobi National Park



Source: Google Earth Satellite Image (Maxar Technologies)

Figure 43. The Southern Bypass Road has no facilities or cyclists or pedestrians who are frequently on the roadway



Source: ITDP Africa

Western Bypass

China is also financing the Western Bypass. This road is more problematic as it passes through a rapidly developing urban area and properties have direct access onto a service road along the highway. There are only a few pedestrian facilities in some but not all built-up areas, few easy crossings, and no cycling facilities along the road. The properties being developed along it are all car-oriented. No public transit provision has been included.

Nairobi Expressway

China's most important and controversial project in Nairobi is the Nairobi Expressway, connecting Jomo Kenyatta International Airport to the neighborhood of Rironi, and passing through downtown Nairobi.

This project was originally planned to be financed by the World Bank. The World Bank committed to including a BRT on the highway to ensure that the BRT was integral to the highway design. This is critical as it represents the most important matatu (minibus) corridor in the country. However, the BRT designs by the World Bank's original consultants, even according to World Bank staff, were poor. While unable to change everything about the BRT design, cooperation between ITDP Africa, project consultants and KeNHA led to significant improvements, particularly in the BRT designs on critical sections between downtown and the airport.³³

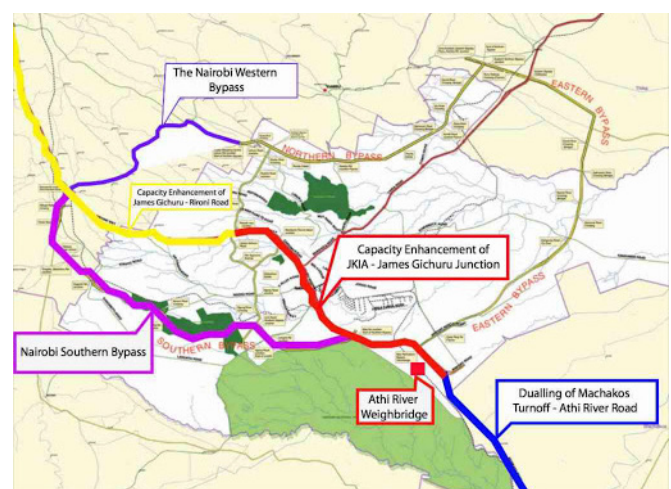
The worsening of Kenyan debt, however, in part due to China's railway loans, increased the IMF's concern about Kenyan debt exposure, so the World Bank was no longer

able to finance the complete highway. The Government of Kenya then turned to China to finance the road as a public-private partnership (PPP) toll highway. China had recently pulled out of financing the last section of the SGR to the Ugandan border as debt problems worsened, so as a consolation to the government of Kenya, agreed to finance the Nairobi Expressway in its entirety. The previous World Bank-sponsored designs were dropped and new plans for a toll road were drawn up by the China Road and Bridge Corp.

Unlike the other road projects discussed, the Nairobi Expressway is not being financed by one of China's ECAs. Rather China Road and Bridge Corp is financing the highway as a PPP: they hope to cover the cost by collecting toll revenue, but as the PPP agreement is not public, it is not clear whether the Chinese or Kenyan government will end up owing China Road and Bridge Corp if in the end the government fails to implement tolls on the highway for fear of a political backlash, or if the toll revenue does not materialize for other reasons.

The new designs also dropped the original BRT designs, and other shortcuts may have also been taken on details such as drainage, as the project was developed in great haste. After public pressure mounted due to the BRT elements being dropped, the Government of Kenya then asked the same company to retrofit the designs to accommodate a BRT. Because the designs are a retrofit rather than integral to the design, the BRT will be badly compromised if it ever materializes. Because the road flyover was not split, leaving a space in the middle for the BRT to continue down the central verge on the surface, the BRT lanes cross awkwardly back and forth between the median and curb, and eventually end up in the congested curb lane, which will compromise the service significantly.

Figure 44. Image of Nairobi bypass roads



Source: C. Wekesa. "Work on Nairobi Sh17.3 billion Western Bypass to Begin" Star (Kenya). June 4, 2016.

³³ Interview with Chris Kost, Director, ITDP Africa

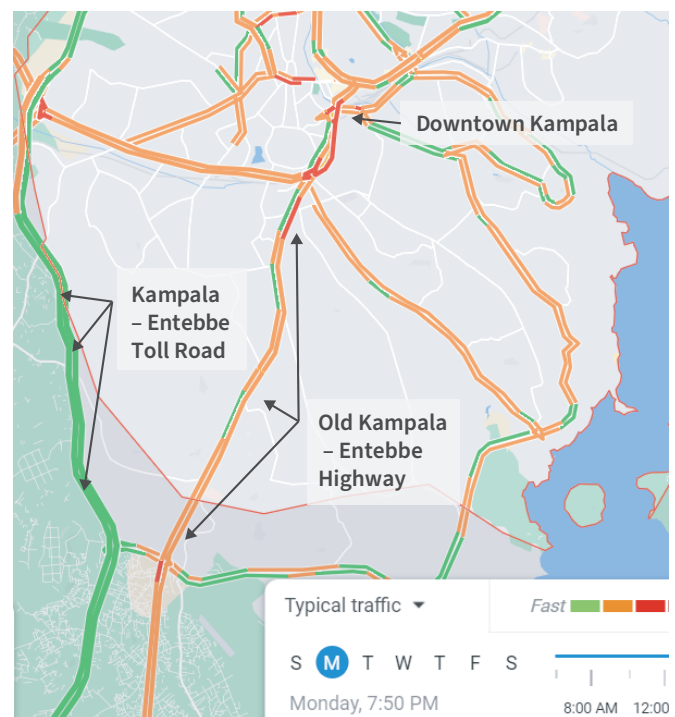
In summary, the Chinese-financed road projects in Kenya likely contributed to Kenya's indebtedness. When the IMF started to place limits on new borrowing, the World Bank and the other MDBs slowed their lending, while China continued to lend money, finding new ways such as PPP financing that create longer term debt risks for the country. The Chinese involvement in the Nairobi Expressway undermined some better designs originally developed under the World Bank. Better coordination with the other development institutions and greater transparency might have avoided some of these mistakes.

Uganda

Another example is the Kampala to Entebbe toll road in Uganda. This 50km road between Entebbe and Kampala, serves one of the most important economic corridors in Uganda, connecting two cities and the main international airport. The trip commonly takes up to 3 hours, much of it spent inhaling toxic fumes and deadly particulates. Uganda had been planning to build the road for some time, and in 2009 the China Communications Construction Corporation proposed to build the road and secured CHEXIM backing. By 2011 they had the approval of Parliament. By 2018 the road was completed. It was originally supposed to cost \$475 million, of which CHEXIM would finance \$350 million. The road is designed as a toll road, and as of 2021 a company had just been contracted to manage the toll collection process.

“The +\$475 million new toll road ultimately fails to address the main traffic bottleneck, caused almost entirely by a few saturated roundabouts and double-parked vehicles at a popular market.”

Figure 45. Peak period traffic conditions between Kampala and Entebbe. The old road is still badly congested, while the new road is uncongested



Source: Google Maps, typical peak hour traffic conditions

While it is too early to tell how successful the road will be financially, the road is currently underutilized, and the tolls have yet to be imposed. While some trips from Kampala to Entebbe have seen significant reductions in travel time, the road ultimately fails to alleviate the main traffic bottlenecks that affect most trips from the city center. The new road does not reach downtown – it only connects to the Northern Bypass which is also difficult to reach from downtown during the peak traffic period. It does, however, provide a good connection between the international airport, the President's Palace in Entebbe, and the Munyonyo Resort on the lake where President Museveni entertains foreign dignitaries.

“A BRT would have easily accommodated the pre-Covid demand volume, and any future demand, and would have cost half as much.”

ITDP Africa did an analysis of the traffic problem on the old Entebbe – Kampala highway, and the traffic bottleneck was almost entirely caused by a few saturated roundabouts and double-parked vehicles at a critical market. To solve this problem, it was clearly not necessary to spend \$475 million.

JICA is rebuilding two of these roundabouts with flyovers. The one at Clock Tower (in the direction of Entebbe) is flawed. It is in a built-up area and has been designed in a way that forces crossing pedestrians to use an inconvenient pedestrian overpass. The second roundabout at Centenary Park was vetted extensively with NGOs and is now reasonably well designed, taking on board concerns about non-motorized movement through the intersection. Meanwhile, the entirety of the matatus and most of the traffic between Entebbe and downtown Kampala continues to take the old road which remains badly congested. During the off-peak period, the traffic on the old road is not bad, so even fewer people will take the new road in the off-peak once the tolls are imposed. This does not auger well for the financial feasibility of the road. The road also lacks many connections to other roads and faced significant cost overruns, the old road has thus been left in its current state, hostile to pedestrians, cyclists, etc.

Uganda has big problems handling resettlement. Uganda has fairly robust legal protections for citizens facing involuntary resettlement, and the government is not particularly adept at managing the process. China's project managers faced great challenges with resettlement:³⁴

‘in China we plan for everything. . .it is hard for Chinese to understand why the Ugandan government failed to even make a 5-year plan’. They also note that China does not, on principle, undertake urban and regional planning for African governments, instead working in alignment with governments’ own plans. In the case of the Expressway, however, there was no effective plan in place for Wakiso District, which the Expressway now carves into two.’³⁵

³⁴ Goodfellow and Huang, Op. cit. p. 665

³⁵ Goodfellow and Huang, op. cit. p. 666

Urban public transport

Metro and LRT projects tend to bring similar benefits but cost a lot more than BRT. BRT investments, if properly designed, are less likely to impose a significant debt burden on the country, are more likely to involve local operators, and can serve a lot more people by better integrating with the existing bus network. One of the reasons many countries opt for metro and LRT systems rather than more fiscally sustainable solutions like BRT is precisely because the governments of the major suppliers are usually willing to provide generous export credits. Governments are more than willing to provide this credit as they know the project will lock the borrowing country into a long-term dependence on their spare parts suppliers. JICA has been most prominent in this area, with KfW and the AFD also heavily involved in numerous metro projects. Their firms have been backed by very generous export credit terms.

China's policy banks, to date, have only funded a few major urban rail projects. With China's massive domestic metro construction over the last decade, its own industry appears to be fully deployed domestically. However, as the major Chinese cities complete the buildout of their metro systems, it is very likely that the next wave of China's 'going out' will involve a push for new metro systems. It is thus important to take a close look at the successes and failures of at least one of these projects.

Addis Ababa LRT

Plans for mass rapid transit in Addis Ababa date from at least the beginning of the millennium. When the decision to build a light rail transit (LRT) emerged, the transportation master plan in operation was one financed by the AFD. The corridors on which the LRT were built are reflected in the master plan as BRT corridors. According to one expert:

“The decision to switch to LRT from BRT the following year (2007) was not driven by China, coming instead directly from Federal government – although some stakeholders believed that LRT was suggested to the government by a (non-Chinese) foreign firm. The decision to opt for LRT also reflected the Ethiopian government's confidence in the new Ethiopian Railway Corporation (ERC), an operational arm of Ministry of Transport originating in a World Bank-supported institutional reform project (Boudet et al., 2015). ERC was established in 2007 mainly to plan and facilitate the Addis-Djibouti railway, though its remit was expanded to include the LRT.”³⁶

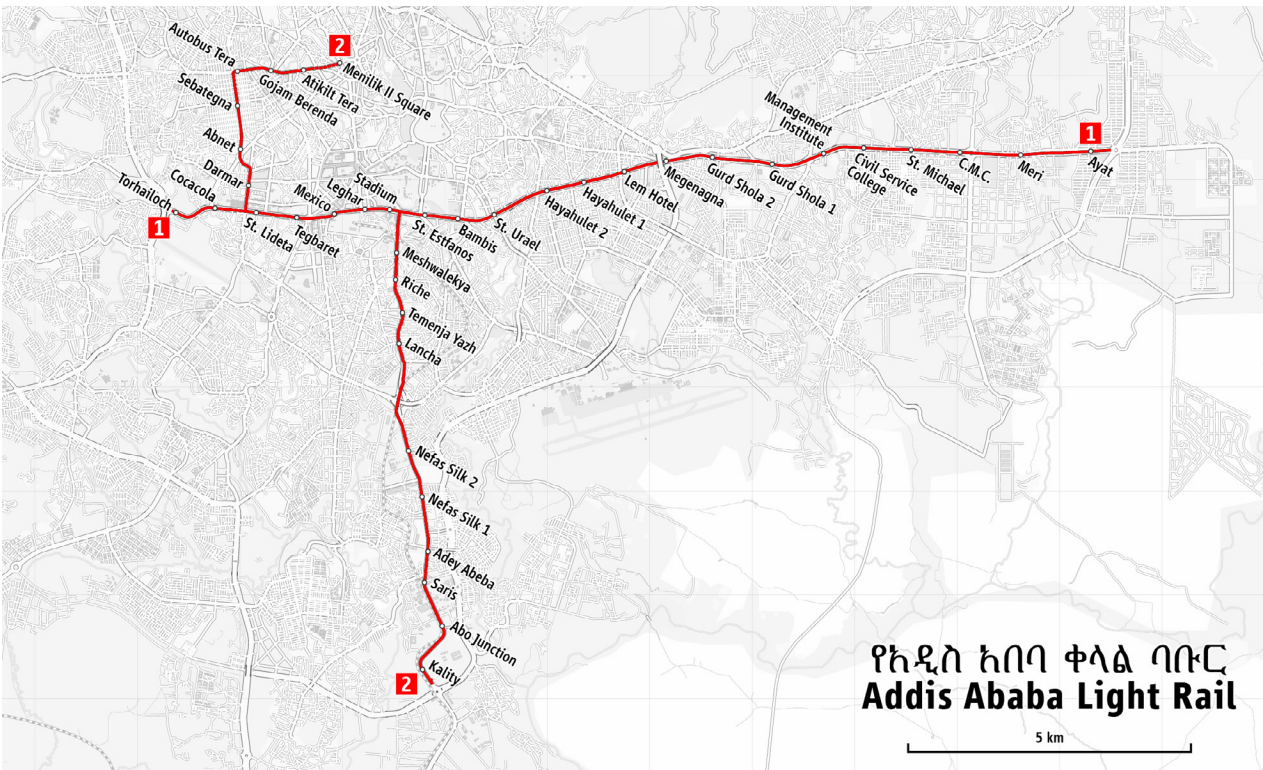
³⁶ Goodfellow & Huang, op. cit. p. 663.

Figure 46. The Addis Ababa LRT financed by China



Source: A. Savin (Wikimedia Commons)

Figure 47. Operating corridors of the Addis Ababa LRT and their relation to the Addis-Djibouti railroad



Source: Maximilian Dörrbecker / Chumwa (Wikimedia Commons) Own work, using OpenStreetMap data for the background, CC BY-SA 2.0

The Government of Ethiopia put the Addis Ababa LRT system out to competitive tender as a design-build contract. The financing that the China Railway Engineering Company (CREC) promised from CHEXIM was critical to their team winning the bid by having by far the lowest offer price. In 2009, CREC won the tender, and by 2011, financing from CHEXIM was signed. Four years later, both lines were already operational. The loan from CHEXIM was a 23-year, \$475 million loan at roughly commercial interest rates, with a three-year grace period. After the system opened in 2015, an operating contract was awarded by CREC to the Shenzhen Metro Rail Corporation, their first overseas operating contract.³⁷

At 34 km of mostly elevated railway, even if the estimated cost overrun of around \$60 million is included, the system only cost about \$17 million per km. This is a very low price for an elevated LRT by international standards. The bid was apparently half the cost of the next closest bidder, an Italian company. By means of comparison, the AFD-financed BRT project in Addis, which is mostly at grade, is projected to cost around \$7 million per km, and normally an LRT is far more expensive than a BRT, usually costing around \$20 – \$40 million in a similar context. Still, BRT in the same corridor would have cost half of this.

As with the Addis-Djibouti Railway, the Addis LRT is a major contributor to Ethiopia's debt crisis. Even before Covid-19, during its first 4 years of operation, it only received \$11 million in operating revenue, but it cost \$154 million to operate. The feasibility studies claimed that the system would turn an operating profit within ten years mainly from fare revenue, but also from the sale of advertising and the rental of commercial space in the stations. Even before Covid-19, the system was nowhere close to being on target. Ethiopia has reportedly stopped paying some of this debt.³⁸

Demand has been depressed by low capacity and reliability issues.³⁹ The Addis LRT has a design capacity of 15,000 passengers per hour in the peak direction (PPHPD) per corridor, but in fact, its current capacity is only 3,434 PPHPD.⁴⁰ The system, pre-pandemic, carried around 113,000 daily passengers while the design capacity was for around 300,000 daily passengers. The main problem is that the power grid is not strong enough to handle more train sets, though the infrastructure can handle them.

Poor reliability has also depressed demand. Frequent power failures, the same problem crippling the Addis-Djibouti Railway, also afflict the LRT. The system's financial problems have contributed to a shortage of spare parts, further compromising service regularity.

Poor integration with other forms of municipal transportation, such as the bus system has also suppressed demand. Much of the transit ridership in the corridor remains on the surface in buses and minibuses. The project was sponsored by the national government and controlled by the ERC, while the bus system and informal minibuses are controlled by the municipality. According to press reports:

“The tracks are elevated at some parts and cut between and through road lanes at other parts of the city, making it harder to cross to the other side for cars and minibuses. It is also not easy for pedestrians to cross the road to reach stations where there is no overhead crossing; it can be literally life threatening, as we experienced it. In some cases, we had the feeling that the builders failed to plan the attached infrastructure properly.”⁴¹

The very low fare – between \$0.08 and \$0.20 – also contributed to the financial problem. CREC recommended a fare of around \$0.90, so this is an Ethiopian Government decision. Additionally, there appear to be very few people checking tickets.⁴²

A BRT would not have suffered similar capacity constraints. It could have operated diesel buses or a mixed of diesel and battery-electric, to mitigate the risk of power outages.

From a capacity perspective, a BRT would have easily accommodated the pre-Covid demand volume, and any future demand, and would have cost half as much. Even single-lane BRT systems like Mexico City are carrying over 8,000 PPHPD, and BRT systems with passing lanes at stations have capacities approaching 35,000 PPHPD.

BRT stations would also have been more frequent and accessible. Access to many LRT stations is via a steep set of stairs that are difficult for elderly and disabled people. At an average distance of 0.8km between stations, the LRT stations are somewhat farther apart than optimal, which would be about 0.5 km between stations in a homogeneously built-up area.

³⁷ Much of this discussion relies on Chen, Y. 2021. Laying the Tracks: the Political Economy of Railway Development in Ethiopia's Railway Sector and Implications for Technology Transfer.

³⁸ “Five years on, Addis light rail still plagued by debt.” ADF, March 24, 2021. <https://adf-magazine.com/2021/03/five-years-on-addis-ababa-light-rail-still-plagued-by-debt/>

³⁹ https://en.wikipedia.org/wiki/Addis_Ababa_Light_Rail

⁴⁰ Supplied to ITDP Africa's Ethiopia office by the Ethiopian Railway Corporation.

⁴¹ I. Tarrosi & Z. Voros. “China and Ethiopia Part I: The Light Railway System” The Diplomat. Feb. 13, 2018 <https://thediplomat.com/2018/02/china-and-ethiopia-part-1-the-light-railway-system/>

⁴² I. Tarrosi & Z. Voros. “Revisiting Chinese transportation projects in Ethiopia.” The Diplomat. Jan. 26, 2019. <https://thediplomat.com/2019/01/revisiting-chinese-transportation-projects-in-ethiopia/>

Figure 48. Addis LRT: Low frequency leaves many on the bus



Source: ITDP Africa

Training of operators would also have been easier with a BRT system. The Shenzhen Metro Company appears to have done a good job training the Ethiopian Rail Corporation (ERC) staff to run the project:

“After three years, driving and daily operation of the LRT had been completely handed over to Ethiopian staff, with a skeletal Chinese staff for ‘backroom’ support and ‘project sustainability.’ Driver training began before the project had been completed via student exchanges to Tianjin Railway University, and the project director commented on the smooth transition from Chinese drivers to domestic trainees over the course of the three-year O&M contract with CREC and Shenzhen Metro (SZMC). The presence of SZMC, a company with experience in rail operations, appears to have made a difference in terms of capacity building in the LRT project.”⁴³

Nonetheless, there are already many trained bus drivers in Addis Ababa that could have operated the BRT with only minor training.

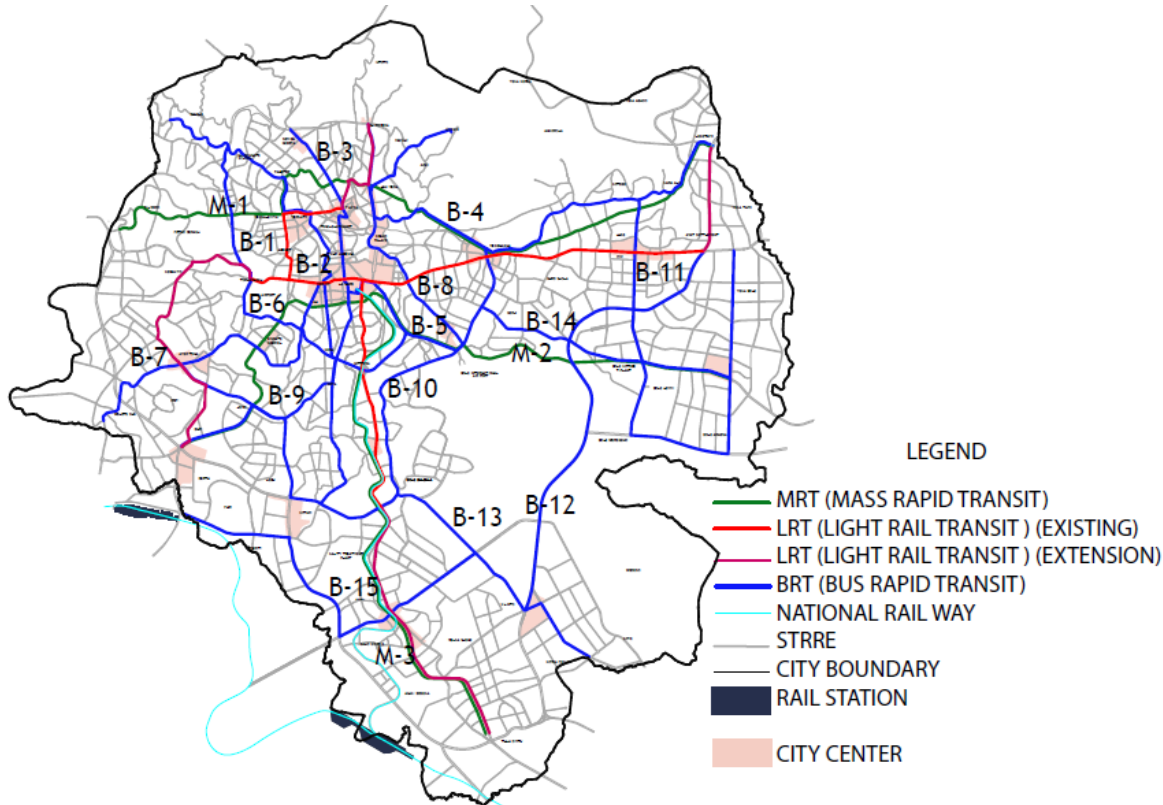
As the power source is hydro-electric it should theoretically be very good in terms of CO₂, though the CO₂ from new hydropower depends entirely on how much methane is created by the drowning of plant vegetation. Methane is a greenhouse gas 25 times as damaging as CO₂. The flooded area is in a tropical lowland, which means a lot of vegetation will drown, releasing enormous amounts of methane. This is partially mitigated by the high reservoir depth, which limits the spread of the water. In short, the CO₂ impacts of the dam are probably better than for burning diesel in the long run, but they are highly unpredictable.⁴⁴

In summary, the decision to build an LRT was probably not appropriate given Ethiopia’s level of debt. This was not China’s decision, and many other countries would have been ready to build and finance it as well. The construction was done rapidly and at a reasonable price, and the power problems that are the main problem are also not China’s fault. The decision to keep the fare extremely low was also a decision of the Ethiopian government, and this has no doubt contributed to political tension between China and Ethiopia since Ethiopia is unable to service its debt. Never-

⁴³ Chen, Yunnan. 2021. Laying the Tracks: The Political Economy of Railway Development in Ethiopia’s Railroad Sector and Implications for Technology Transfer. Johns Hopkins University China Africa Research Initiative, Working Paper #43.p 14.

⁴⁴ <https://link.springer.com/article/10.1007%2Fs11356-020-11746-4>

Figure 49. Planned Addis Ababa rapid transit corridors



Source: 2017 Addis Ababa Transport Master Plan

Figure 50. Rendering of a conceptual design for BRT in Addis Ababa



Source: Zhongmei Engineering Group, Ltd.

theless, China exposed itself to significant project risks by agreeing to finance an LRT in a low-income country with significant power problems.

A higher-income, less indebted country might be able to absorb the additional costs of higher cost urban rapid transit options like LRT, but in poor countries the opportunity cost of these wasted funds is enormous.

China and BRT Projects

While Chinese export credit did not ultimately fund any of the BRT projects moving forward in Addis, this is not for lack of trying. The Ethiopian government understands that it cannot possibly build LRT or heavier rail rapid transit all over Addis Ababa, and that upgrading the bus system to BRT would deliver a lot more improvements to the transit system a lot faster than a pure LRT alternative. Addis Ababa has wide boulevards conducive to BRT treatments and requiring limited land acquisition. Unlike the LRT system, the BRT services can operate both inside the BRT trunk corridors but also in mixed traffic on other streets, to provide a much wider network of system coverage.

The 2017 Addis Ababa Master Plan includes 15 BRT corridors. Six of these, including what eventually became the LRT corridors, had already been proposed as BRT by French-supported feasibility studies in the mid-2000.⁴⁵ The first corridor, B2, is shown below (blue line). A preliminary design was developed by consultants to the AFD who were not experienced in high volume BRT design, and according to experts from ITDP Africa, as well as other technical experts from China that worked on the Guangzhou BRT system, the preliminary designs were too low capacity to meet the demand. The Addis Ababa Transport Bureau supported by the AFD had the designs modified and the project is moving forward with AFD financing.

The B2 corridor includes 19.2km of full BRT and is estimated to cost about \$7 million per kilometer, but this includes a number of surface improvements for pedestrians and other road users.

In 2016, a Chinese engineering company, Zhongmei Engineering Group Limited, which grew out of the coal industry in Jiangxi province, tried to get CHEXIM financing to build five BRT corridors in Addis Ababa. They hired the design team that worked on the award-winning Guangzhou and Yangzhou BRTs in China to work with them for several months to develop a conceptual design for five of the BRT corridors that were included in the master plan. This work was done under a Memorandum of Understanding with the Municipality of Addis Ababa. The work was of high

quality, and it was well marketed to the Municipality. The engineering company promised to secure financing from CHEXIM should the project be approved.

Ultimately, CHEXIM's decision not to finance the project was more related to the fact that CHEXIM already had concerns about the level of Ethiopian debt to China. As relations between the two countries cooled, discussions stalled. Some say that the engineering company's price quote was high, much higher than similar work done in China. When CHEXIM declined, the Municipality turned to the Korean Export Import Bank for financing for the second BRT corridor, B6.

This example shows that China has no antipathy to doing BRT projects, and in fact has some of the leading BRT experts in the world. It does show, however, that China's megaprojects ended up crowding out smaller scale, higher impact loans.

Other urban transit loans

The AIIB is also co-financing the Karachi Red Line BRT. The Karachi Red Line was designed by a team hired by the ADB. The design, engineering and business planning teams are the same as the ones that designed the Peshawar BRT, also financed by the ADB, which is rated Gold under *The BRT Standard*⁴⁶. The designs are thus highly promising. The AIIB is financing \$71.8 million of the \$503 million project. The project is entirely administered by the ADB. China has significant influence over the ADB, with its 10% share, and within the ADB, China's influence is said to be most pronounced in the Central and Western Asia sections. This may encourage greater cooperation in the region between the AIIB, CHEXIM and the ADB, but there is also competition within China between these entities.

In Nairobi, Chinese engineering companies that are now retrofitting the Nairobi Expressway for BRT are keenly interested in winning the construction contract for the BRT, as well as potentially for its operations.

As such, there is strong and growing evidence that in the urban transportation sector, China could be a critical and highly constructive partner to developing countries.

⁴⁵ Goodfellow and Huang, op. cit, p. 663

⁴⁶ Brtstandard.org

Recommendations for Improved Chinese Overseas Transport Lending

China's rise to prominence as a low interest lender to developing countries creates an opportunity to renegotiate some of the international rules governing such lending, particularly how debt relief is managed.

As a result of the Covid-19 crisis, even the IMF has begun to question its traditional approach to debt relief, which historically has been based on austerity rather than growth. There is a new recognition inside the IMF that austerity did not really work and simply made the debt problem worse.⁴⁷ Today, the IMF is more open to debt relief and efforts to raise money from wealth taxation, carbon taxation, or other taxes on high income individuals than perhaps ever before.⁴⁸ However, the IMF, in its negotiations with debtor countries, is likely to fall back on regressive but easier to collect forms of taxation like the Value Added Tax.⁴⁹

China has a historic opportunity to use its growing influence over the debt negotiations to push pro-growth approaches to resolving the debt crisis. However, China will need to engage in the multilateral processes in a more transparent manner or else there is a risk that talks could unravel. Today there is mutual suspicion that bailouts from the IMF will secretly be bailing out Chinese debt, or that Chinese debt forgiveness is going to bail out the MDBs or other debtor nations.

At the same time, China should reflect on the problems that have emerged with its own loan approval process. The best way to prevent a major debt crisis is to avoid accumulating debt from bad projects in the first place. Some of the exciting projects that China financed, such as a pan-East African railway, would have had a greater chance of success if lower cost, lower risk, more economically productive choices had been made.

Less expensive projects with clearer economic and social benefits, such as upgrading railways and highways along their current alignments, rather than along new alignments, and building the Addis BRT system rather than the

LRT, would have done more to address transport needs, and less to encumber the country in debt. Moving forward, China needs to more carefully appraise projects before financing them.

This chapter provides policy recommendations for Chinese decision makers, based on the findings in this study.

1 Help debtor countries grow out of their transport debt

China's policy banks, together with the Paris Club, should help debtor countries grow out of their debt. The cause of the current debt crisis is two-fold: One major reason is the Covid-19 crisis, a unique emergency that no one was prepared for. The other is that both the MDBs, other ECAs, and China's policy banks made some irresponsible loans for projects that have worsened the debt in these countries. Evidence from previous debt crises shows that imposing austerity on the borrowers is not a good way to ensure that some part of the debt is ultimately repaid.

China and the Paris Club, through the G20 FMCBD, should write off and/or reschedule this debt to levels that the debtors can sustain. Otherwise, China's economic ambitions in the developing world will be dashed along with the hopes of China's partners. Offering debt relief for the CDB and other state bank loans as well as the CHEXIM loans would be a good place to start.⁵⁰ China's greater state involvement in its economy should make this easier than for other countries. China has an opportunity to take a leadership position in the developing world by redefining debt relief in a pro-growth, rather than austerity-oriented way.

⁴⁷ J. Ostry, et.al. "Neo-Liberalism: Oversold?" Finance and Development, June 2016, Vo. 53, No. 2. Washington DC. IMF. <https://www.imf.org/external/pubs/ft/fandd/2016/06/ostry.htm>

⁴⁸ Fiscal Monitor, April 2021. IMF. <https://www.imf.org/en/Publications/FM/Issues/2021/03/29/fiscal-monitor-april-2021>

⁴⁹ "IMF Paves New Way for Austerity Post-Covid 19." Oxfam. October 12, 2020. <https://www.oxfam.org/en/press-releases/imf-paves-way-new-era-austerity-post-covid-19>

⁵⁰ J. Nyiabiagi. "China, Africa, and the big coronavirus relief question" South China Morning Post July 26, 2021. <https://www.scmp.com/news/china/diplomacy/article/3142455/china-africa-and-big-coronavirus-debt-relief-question>

2 Fully assess economic and financial impacts of transport projects

China's policy banks, other ECAs, and the MDBs have all failed to properly appraise the financial impacts of their loans on borrowing countries, leaving many countries severely in debt, and others worse off than before. A project that brings limited economic development to the borrowing country, while leaving the country deeper in debt is in no country's interest, even if all the contractors make a profit. Every country has much more to gain from economically healthy and friendly trading conditions.

China's policy banks should improve their in-house capacity to perform economic and financial appraisal on all transportation projects. They should make their loans contingent on such rigorous economic and financial appraisal. In closer collaboration with other development partners, China's policy banks and the AIIB should do more to steer borrowing countries away from misguided white elephant projects and towards more economically sensible transport investments.

The MDBs do somewhat better in their financial appraisals of rapid transit and rail projects, but they fail to perform a financial impact analysis on their road sector loans. Road sector loans by all lending institutions can be made contingent on increases in fuel taxation, tolling of upgraded highways, carbon taxation payments, or other funds to ensure the borrower will have the funds to maintain the road and service the debt.

3 Do an alternatives analysis and fund the option with the best return on investment

China's policy banks, the MDBs, and the other ECAs, also need to be more careful about funding extremely expensive megaprojects. When there is a possibility to upgrade and improve the safety on an existing road or railway along its current right of way, or to build some entirely new road or railway on a new alignment, these alternatives must be considered and their benefits and costs weighed carefully. As a rule of thumb, China and the MDBs should focus on upgrading the existing infrastructure first. Loans should be prioritized in the following order:

i. Upgrade existing highways

Rather than building entirely new roads on entirely new right-of-way, highway projects should focus on upgrading and resolving bottlenecks on existing highways; providing urban bypasses for through-trucks; and improving safety for non-motorized road users.

ii. Upgrade existing railways to standard gauge

It is reasonable to upgrade intercity rail connections to standard gauge but, where possible, do so on existing railway alignment, rather than building on an entirely new alignment. The saved money could be invested in critical transshipment infrastructure and local spur connections to major rail freight users. It also seems likely that upgrading to standard gauge, rather than upgrading existing narrow-gauge infrastructure, will provide better integration opportunities as the rest of the world is also moving in that direction. However, this would need further investigation.

iii. Focus on BRT before LRT or MRT

Urban transit investments should focus more on BRT projects which are: lower cost; better integrated with the bus and minibuss system; improve conditions for cyclists and pedestrians on surface streets; and improve road safety. More expensive light or heavy rail projects are poorly connected to surface transit and worsen, rather than improve, road safety on surface streets.

4 Coordinate better with other international donors

Better coordination among donors would reduce growing international concern about China's role in international development and improve development outcomes for developing countries.

This should start with procurement. China should at least follow the same transparent and competitive procurement process followed by the other ECAs, if not the MDBs. Competitive tendering is critical to ensure the best contractors are hired at the best price, and also to making the project transparent to the public. Following best practice in procurement is also critical to avoiding any appearance of impropriety on the part of Chinese companies. This should help reduce the political risks of getting embroiled in scandals like what happened in South Africa.

While many Chinese-financed projects are not subjected to ICB, Chinese companies tend to win projects that are subjected to the competitive tendering practices of other

countries. China's companies are so dominant in the construction and engineering field that opening China's own projects to ICB presents very little commercial risk.

There is almost never anything to be gained from keeping secrets from the public, but this is particularly true when operating in a foreign country. A great deal of mistrust of China's motives is based purely on misunderstandings about what may or may not be in agreements between China and borrowing governments that are not made public.

The MDBs and other ECAs formerly kept their loan agreements secret at the request of borrowing country governments. But over time, this was very damaging to their reputations, and today most of the ECAs and the MDBs publish most information about their lending.

It is, of course, reasonable for China to resist simply accepting agreements like the *OECD Arrangement on Officially Supported Export Credit* and its corollary agreement, the *Common Approaches for Officially Supported Export Credits and Environmental and Social Due Diligence*, which were established without China's involvement. However, China could more constructively engage in the International Working Group on Export Credit to foster a new international regime which is more aligned with China's interests. China's own domestic due diligence has improved in terms of environmental and social safeguards and the transparency requirements are not a significant threat to China's competitiveness.

Co-financing more projects with the MDBs, particularly the AIIB which it dominates, is a good short-term mechanism for improving coordination and overcoming short term skill shortages within CHEXIM and the CDB. By co-financing, CHEXIM and CDB can learn more about how the MDBs operate and take on board whatever longer-term institutional learning is appropriate.

Chinese workers, the local labor force feel like scab labor has been brought in, and it leaves a bad impression. It is also often not easy for Chinese workers to integrate into the local society into which they have been thrust. Chinese *and* local leadership should do more to make these workers feel welcome and integrate them into the society.

6 Increase in-house capacity to lead, rather than follow, project development

Chinese experts have rapidly become some of the most experienced professionals in construction and engineering in developing countries. Yet China's policy banks have very limited internal institutional capacity to form or influence policy and tend to rely heavily on their client companies rather than pursuing a coherent strategy. China's policy banks spent far too little effort understanding the broader policy and development ramifications of its own actions.

China's policy banks should develop more in-house capacity to develop country-level strategies and tie their lending to such strategies. They should lead, rather than merely follow, the policy dialog that is currently dominated by the MDBs.

7 Assist borrowers with resettlement following best practice

Resettlement is a major bottleneck in the transport sector. China has decades of experience in managing involuntary resettlement domestically. Rather than simply assuming that a borrowing country will handle resettlement in a way that ensures a positive outcome, China should invest in the human resources to assist in a transparent and fair resettlement process for the projects it finances.

5 Improve labor conditions and labor relations

China's success in delivering projects on time and at a reasonable cost is second to none. However, the over-use of Chinese labor tends to antagonize local populations. While it is often very time consuming, expensive, and culturally difficult to hire more local labor, it is critical for the transfer of knowledge to the borrowing country, and to the favorable impression that is left in the country.

Chinese laborers in the country, meanwhile, must be better treated. Chinese workers are all ambassadors for China. If the residents of a country see poorly housed and clothed

8 Use project finance to export best practices from China

China's ECAs should do more to export the sort of projects they do well within China:

i. BRTs, greenways, bikeways, affordable housing

China has some of the highest speed, highest capacity BRT systems in the world, designed by their own experts. These systems ensure a sustainable market for Chinese buses, without encumbering the borrowing country with debt.

China has also done amazing work with greenways, opening up once buried or contaminated waterways to pedestrians and cyclists, breathing new life into cities.

Chinese cities have some of the best bike infrastructure in the world, great pedestrian zones, amazing new parks, and beautiful pedestrian bridges over major rivers. Chinese urban sector loans could bring some of these elements to the developing world.

China also has high density transit-oriented communities with affordable housing. The MDBs and other ECAs build almost no affordable housing. The countries of the Global South, with rapidly growing cities, have an acute shortage of affordable, properly serviced housing. Helping cities to grow in a high-density, transit-oriented urban form could dramatically reduce the carbon footprint of future cities.

These sorts of lower cost but high impact projects would bring far greater safety, sustainability, joy, and economic development to the citizens of developing countries, as well as a lot less debt.

Study tours for critical stakeholders are a good way to promote good projects, rather than to merely finance bad projects initiated by others. Study tours help show off not only China's impressive highways and high-speed rail lines, but also some of its softer, smaller, and cheaper municipal achievements. These study tours inspire borrowers to invest in scarce transportation investments more wisely than they might otherwise have considered, while building lasting relationships between partners.

ii. Technical support for municipal governments.

In comparison with much of the developing world, China's municipalities are very well governed. Many developing countries have extremely weak municipal capacity, and this often results in poor decisions or weak project implementation. China could do more to build capacity among municipal government.

China's cities are particularly good at raising money. They could do more to promote their model of raising government revenue. One of the secrets to China's astonishing domestic growth has been the ability of the municipal governments to capture the value of land appreciation at the urban periphery to finance transportation infrastructure.⁵¹ Most of the land value capture occurs when China's very large municipalities, many of which include suburban land at the periphery, change the designation of this land from agricultural to urban, suddenly increasing its value dramatically. Chinese cities, in essence, appropriate this increment and use it to finance transportation infrastructure.

Chinese experts could help municipalities increase their revenue raising possibilities through land value capture. This would help increase the budget that cities have available to finance projects that Chinese companies are well positioned to implement.

⁵¹ Hook, W., K.Fjellstrom, O. Diaz. 2006. *Options for Financing BRT in China*. (New York: ITDP) <https://itdpdotorg.wordpress.com/wp-content/uploads/2014/07/China-BRT-Financing-Final.pdf>

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Data Sources

The data in all charts and graphs was taken from a database created by extracting transport sector data from the following databases:

China ECA: China Export Credit Agency data was taken from Boston University's China's Development Finance Database (www.bu.edu/gdp/chinas-overseas-development-finance), supplemented by The Johns Hopkins University's School for Advanced International Studies' China- Africa Research Initiative's Chinese Loans to Africa Database (www.sais-cari.org/data). Note that these databases do not yet contain data for 2019 – 2020.

AIIB: Asian Infrastructure Investment Bank data is taken from their loan database on their website (<https://www.aiib.org/en/projects/list/index.html>). Note that the AIIB was only created in 2016.

World Bank: Data is extracted from their projects database (projects.worldbank.org/en/projects-operations/projects-list?os=0).

JICA: Japan International Cooperation Agency data is taken from the loans database on their website (www2.jica.go.jp/en/yen_loan/index.php).

ADB: Asian Development Bank data is from the ADB operational procurement database on their website (data.adb.org/dataset/operational-procurement-database). The ADB changed the way their data was presented in 2016, so comparable data was only available from 2016 until 2020. Pre-2016 data from the ADB was collected manually from their project's database for urban transport loans only.



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