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HOW THE BELT AND ROAD GAINED STEAM: CAUSES AND IMPLICATIONS OF CHINA'S RISE IN GLOBAL INFRASTRUCTURE

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Abstract. Western observers have raised concerns over the rise and now predominance of Chinese state-backed bilateral lending in international infrastructure development. These range from China's growing geopolitical influence to the increasingly unsustainable debt levels of some of the nations receiving investments as part of the Belt and Road Initiative (BRI). In fact the BRI today is simply the next phase of a decades-long shift in the infrastructure sector towards China and away from traditional western development lending institutions. In this study we observe the scale of this trend and its root causes in China's domestic and international development policies for infrastructure and the safeguards policies of western development programs. We use aggregate reporting on infrastructure lending and project-level case studies in nations that have transitioned from western institutions to the BRI. We highlight the need for reforms for China's lending programs, to increase transparency and the financial sustainability of projects, and for western development institutions to maintain environmental and social safeguards while still achieving their stated missions.

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China's rise from an impoverished developing country to a global superpower with the world's second largest economy has occasioned great concern in the United States and other Western countries over the projection of Chinese power and influence throughout the world (Walker and Ludwig 2017, Walker 2018, Diamond and Schell 2018). Among the most important sources of so-called Chinese "sharp power" is its support for infrastructure projects around the world, extending from developing countries into the heart of Europe itself. These projects are part of the Belt and Road Initiative (BRI) first announced by President and Party General Secretary Xi Jinping in 2013. This tremendously ambitious project seeks to shift the center of the entire global economy away from the existing trans-Atlantic/trans-Pacific one centered on the United States, to a Eurasian one centered on China.

Western observers of BRI have raised several concerns. The first and most longstanding critique concerns Chinese approaches to infrastructure development in general: Chinese projects have tended to disregard the levels of environmental, social, and other safeguards observed by Western-backed projects, leading over the long-run to a "race to the bottom" in terms of safeguard compliance. This, it is felt, runs counter to the interests of the receiving countries, much as they need new infrastructure. A second concern regards spreading Chinese foreign policy influence. For example, Chinese sponsorship of infrastructure projects in Eastern Europe and the Balkans under the so-called Sixteen Plus One initiative has led individual members of the European Union to veto efforts at criticizing China over human rights violations, Tibet, or other traditional areas of Western concern. Abusive regimes like that of Nicolas Maduro in Venezuela have benefited from Chinese lending and investment; indeed, the Maduro regime, rather than default on its Chinese debt, has been willing to see its own population literally starve. Finally, there are strategic concerns about the inability of Chinese client countries to exit from their relationships with

China: Sri Lanka, for example, found it impossible to end a large Chinese port project due to the large amount of outstanding debt it owed Beijing, and instead granted China the rights to that port on a 99-year lease.

There is no question that Chinese influence around the world has grown massively, and that BRI and related infrastructure projects are perhaps the chief instrument that Beijing has used to support its broader economic and foreign policy goals. It is our view, however, that Chinese influence through use of the infrastructure lever is subject to certain intrinsic limits. Moreover, the responsibility for this increase in Chinese presence lies as much with the United States, the EU, and Western-backed international institutions like the World Bank as it does with China. The developing world needs infrastructure, but a combination of factors has prevented Western institutions from providing it on a timely and cost-effective basis.

ROOTS OF CHINESE POLICY

China has its own development model. While retaining unique characteristics, this model bears many similarities to those of other East Asian “development states” like Japan, South Korea, Taiwan, and Singapore.

In general, East Asian developmental states have instituted export-led growth strategies that relied far more heavily on state direction than on the more market-oriented approach taken by the United States, Britain, and other Western countries (Haggard 2018). Individual countries in East Asia, however, practiced somewhat different versions of industrial policy: South Korea, for example, used directed credits to promote individual national champions, while Singapore and Taiwan encouraged broader sectors through bank policy and the building of intellectual infrastructure.

China’s model also relied heavily on the state, but emphasized physical infrastructure investment as the primary engine for growth. Since the early 1990’s, Chinese gross capital

formation has ranged between 35% and 45% of GDP (World Bank)—a level unprecedented in other developed and developing economies alike. This gap was particularly evident after the US subprime crisis in 2008 that triggered a global slowdown, which Beijing countered through promotion of huge increases in lending by provincial banks. China's infrastructure buildout happened surprisingly fast, and, as the Chinese economy matured, showed little sign of letting up. Chinese policy banks, and specifically the China Development Bank (CDB), participated in this public investment strategy, with 70% of its loan portfolio directed towards domestic Chinese projects.

An example of this approach was China's creation of a massive domestic high-speed rail (HSR) network (Haynes and Chen, 2015). Between 2003 and 2016, China built 22,000km of HSR, compared to existing networks of 2,647km in France, 3,164km in Japan, and zero in the United States. Total investment as of this writing has reached approximately \$850 billion, based on equally massive borrowing of \$746 billion.²

By the beginning of the second decade of the 21st century, it was becoming clear that China's export-led growth model centered on domestic infrastructure investment was running out of steam (World Bank and Central Bank of China, 2016). Export markets were becoming saturated and political opposition to Chinese imports in developed countries was growing; new demand would have to come from domestic spending within China, and from new markets in developing countries. China's rapid development generated the largest and fastest domestic infrastructure buildout in history, creating a massive infrastructure stock and, correspondingly, a large domestic infrastructure and construction industrial complex. China faced excess capacity in real estate, manufacturing, and infrastructure (Dollar, 2016). This rapid industrial start-and-stop created an industry with a sudden lack of projects to build. Local and regional leaders began to invest in domestic projects that destroyed rather than

² Updated estimates for aggregate spending on HSR provided by Zhenhua Chen; we are grateful to the author for this information.

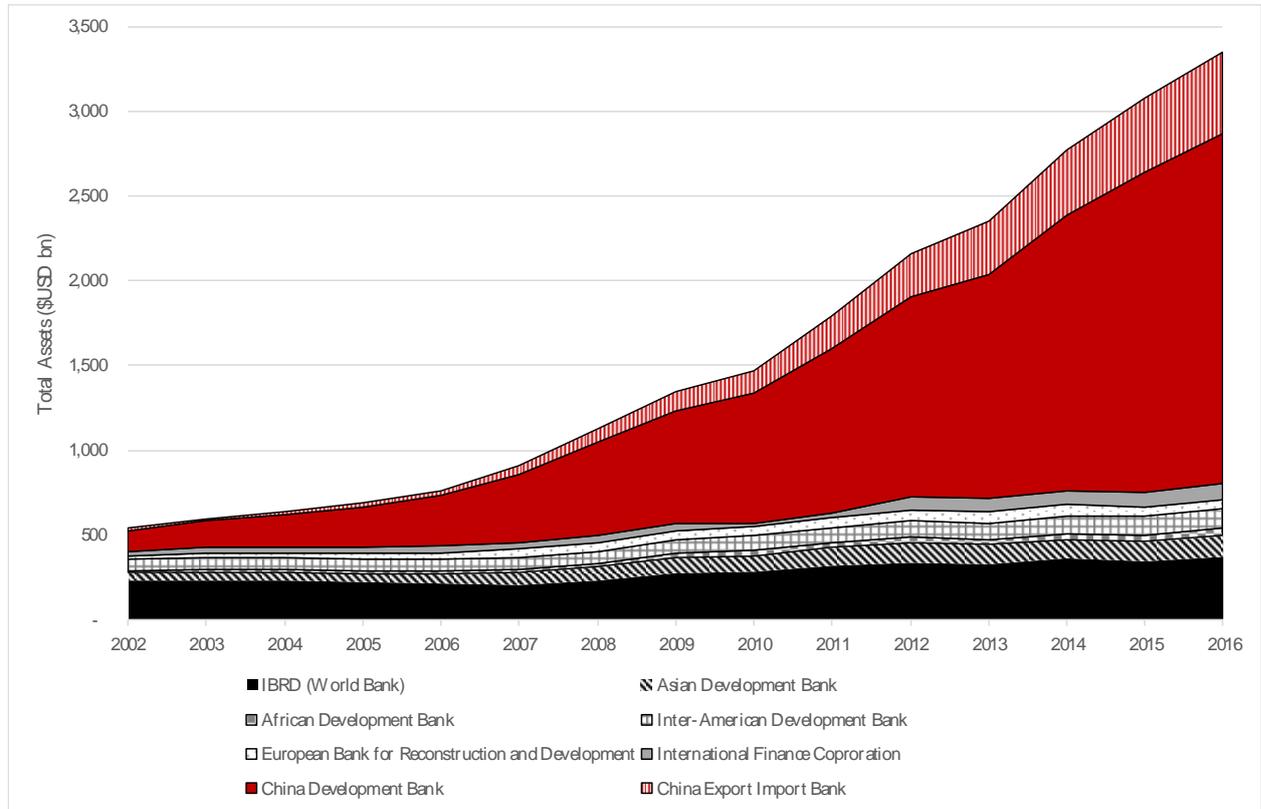
created economic value, contributing to China's widespread problems with domestic Non-Performing Loans (NPLs) (Ansar, Flyvbjerg, Budzier, & Lunn, 2016). These conditions made lending support for international development projects an attractive way to export its excess domestic capacity for construction and infrastructure development, and almost certainly contributed to pressure on China's policy banks to finance international infrastructure projects.

The rapid growth of Chinese bilateral lending has coincided with the emergence of Chinese construction firms in the global infrastructure development sector. In 2007, four of the top ten global construction firms were from China. By 2016, seven of the top ten global construction firms by revenue (from both domestic and international contracts) were from China, including four of the top five (ENR, 2016). The 2016 list contains two French contractors and one Spanish contractor, and no US contractors. Even when controlling for China's domestic infrastructure boom, China's role in international development has dramatically increased over the last decade. In 2005, nine Chinese construction firms ranked in the top 100 global contractors in international (outside of their home country) revenue. By 2016, 20 Chinese firms were in the top 100 by international revenue, more than double that of any other nation (ENR, 2016).

The expansion of China's state-owned construction firms in infrastructure development both domestically and internationally was largely financed by China's policy banks, notably the CDB and the China Export-Import Bank (CEXIM). The expansion of these two development lenders over the last two decades has dwarfed that of traditional western development lenders. Figure 1 shows the total assets of these two institutions as well as a basket of other multilateral lenders, including the International Bank for Reconstruction and Development, the Asian Development Bank, the African Development Bank, the Inter-

American Development Bank, the European Bank for Reconstruction and Development, and the International Finance Corporation.

Figure 1: Total Assets of Select Development Lending Institutions (USDbn)



Like other bilateral lending programs, loans from China’s policy banks come with strings attached. The loans can entail requirements to utilize Chinese construction companies for certain project tasks or import core equipment from Chinese manufacturers. Chinese infrastructure lending has been unique in that a significant portion, at least initially, came in exchange for rights to extract natural resources. More than 50 per cent of Chinese finance in Africa and Latin America is in the form of commodity-backed loans, often with oil or copper (Bräutigam and Gallagher, 2014). Projects financed by Chinese policy banks and delivered by state-owned Chinese companies have also been unique in that they have tended not only to use Chinese companies as construction contractors, but also to import Chinese labor for a significant portion of construction. Estimates suggest that by 2014, the number of Chinese

workers in Africa for both services and contracted projects ranged from 250,000 to over a million (John Hopkins SAIS, 2017; Dollar 2016).³

THE CHINESE APPROACH TO DEVELOPMENT

Infrastructure development is inherently risky. Numerous risks must be evaluated prior to the start of a project, in connection to project execution, natural contingencies like weather and geography, competition, market forces including exchange rates and interest rates, the political and regulatory environment, and geopolitical issues. The value added provided by the organizers of such projects and the financiers backing them has to do with the accurate evaluation of these risks. Nonetheless, developers often get things wrong: a very high percentage of projects are completed over the original budget and behind schedule, the latter also affecting total project costs.

Complicating due diligence still further is the question of externalities. Positive externalities usually center around the extra degree of economic growth that infrastructure is expected to promote, which is why projects are undertaken in the first place. Negative externalities have to do with consequences like environmental damage, displacement of local populations, health and safety issues in project execution and operation, political corruption, and the like. While some projects (e.g., wireless telecoms) can be justified by their internal rate of return (IRR), many projects require some form of subsidy because substantial benefits accrue to people other than the original investors. This explains why infrastructure often needs the backing of a public agency. Misalignment between the incentives facing developers and contractors, on the one hand, and public interest on the other is common: developers and contractors have an interest in understating costs and risks. Their knowledge that taxpayers will ultimately pick up the bill for unanticipated problems produces a systematic bias towards

³ These numbers are contested; there is consensus on the need for producing better data on migration and the number of Chinese workers in these infrastructure developments and for more transparency regarding the terms of loans for infrastructure to guard against mounting unsustainable debt (Dollar, 2016).

undue optimism. To alleviate such bias and as a way of reallocating risks back to the private sector actors responsible for organizing and implementing projects, public-private partnerships have come into vogue in many countries. In any case, both positive and negative externalities are difficult to measure in retrospect, and even more difficult to predict.⁴

Western private investors evaluate a potential infrastructure project by focusing primarily on the project's IRR. If that rate is commensurate with the risks of the investment, the project may go ahead. If the rate is not high enough to justify project risks, it may still proceed if a public agency or international financial institution like the International Finance Corporation (IFC) or World Bank provides backing. Public agencies or donors will also estimate a project's economic returns, but will take into consideration both the positive and negative externalities entailed by the project as well. The due diligence needed to provide these estimates explains why Western-backed projects often require considerable time and resources in early stage planning.

It would appear that Chinese infrastructure projects outside of China suffer from their own systematic biases: Chinese investors tend to overestimate the positive externalities arising from a given project, and to underestimate the negative ones. We assert this based both on a large number of cases we commissioned comparing Chinese and Western infrastructure projects, and on the aggregate performance of the Chinese overseas loan portfolio. Given the lack of transparency surrounding most Chinese projects, it is virtually impossible to find reliable data concerning outcomes on an individual project-by-project basis, so our judgements are informed by the sources that are available.

⁴ China now tops the list of developing countries with the most public-private partnerships at 1,488 projects between 1990-2018 (World Bank PPI, 2018). The top sponsors of these public-private partnerships include Beijing Sound Environment Industry Group in water and sewerage and Xinao Gas Holdings Limited in natural gas (PPI World Bank, 2018). However, given the fact that Chinese SOEs and development banks are likely to be bailed out of bad investments, it is hard to know what is meant when the Chinese call something a "public-private partnership" and how risks are being reallocated to project implementors.

Chinese lenders, it would appear, take IRRs seriously, but are much more focused on potential positive externalities. This attitude apparently arises from China's own experience with domestic infrastructure development. China, after all, invested massively in its own infrastructure without worrying excessively about the economic returns of individual projects. An example is the HSR system noted earlier. While individual lines like the Beijing-Shanghai or Shanghai-Shenzhen routes may well be profitable, it is extremely unlikely that the IRRs come anywhere close to justifying the \$850 billion total investment. Chinese policy in rate-setting would seem to be determined more by political than economic considerations. The payoff that policy-makers expect from the system lies in the extra degree of economic growth they believe the system as a whole will encourage. Moreover, they also anticipate political and social benefits from HSR links between metropolitan centers in coastal China and distant underdeveloped regions in the hinterland (Haynes and Chen 2014). Chinese domestic investment policy has thus been characterized by a "build it and they will come" attitude towards growth.

Chinese policymakers also see advantages to scale and scope. Individual Western-backed projects often fail because of a lack of complementary infrastructure. The Chinese, by contrast, see that a port needs to be connected to a rail system, an electrical grid, and a road network, and proceed to invest in these projects simultaneously. In the process, they hope to build a relationship of trust with the local authorities who benefit and to capitalize on each project's beneficial economic externalities for the other projects.

Chinese policymakers also appear to underestimate negative externalities in their own country. China's massive investments led to huge social disruptions, like the more than 1.35 million people who had to be relocated from their homes to make way for the Three Gorges Dam, in addition to the 17,200 hectares of land and 1,500 enterprises that were inundated or displaced (Wilmsen et al., 2011). China's environmental record is terrible (though not

necessarily worse than that of other countries at a similar level of development); the country's own Ministry of Natural Resources reported a decline in the total arable land for the fourth consecutive year in 2017, and China's official news agency Xinhua reported that 40% of China's arable land suffers from degradation (Reuters 2018;2014).

Investment decisions were not based upon appropriate assessment of risks and returns, but upon government instructions from the "Big Four" Chinese state-owned banks (Li, 2008). Ansar et al (2016) suggest that poor project-level outcomes translate into substantial macroeconomic risks: accumulating debt and non-performing loans; distortionary monetary expansion; and lost alternative investment opportunities.

CHINESE INFRASTRUCTURE INVESTMENT IN PRACTICE

Many of these same attitudes, both Western and Chinese, are carried over into overseas investments. We can illustrate this through several individual cases.

In Jamaica, the Highway 2000 Project is a USD \$1.3bn transportation public-private partnership, the largest project in the country. It was initiated in 1999 after extensive assessment and reviews and was structured as two phases; the first phase is the East-West Highway and the second phase is the North-South Link. Phase 1 is a \$324mm project under an international tender that was awarded to French contractor Bouygues after competitive bidding. The 35-year concession started in 2001. Initially, financing for the project only involved commercial banks, but due to cost overruns during construction, the project was refinanced in 2011 by a consortium of development banks including the IFC, IDB, EIB, and Proparco. This refinancing involved revisiting and adding environmental and social safeguards.

Phase 1 was dominated by the Western approach. The North-South Link, or phase 2, of the project is a \$610mm project and was abandoned by Bouygues after exercising a first right of refusal citing that it was not economic to continue beyond phase 1. Forecasts of

construction costs for phase 2 were simply too high relative to the income the project would generate from tolls. However, Chinese contractor China Harbour Engineering Company (CHEC), a subsidiary of state-owned enterprise China Communications Construction Company, submitted an unsolicited bid to the Government of Jamaica and was awarded phase 2. It is a 50-year concession that began in 2012. The terms of the project included a loan from the China Development Bank as well as rights to develop the land contiguous to the highway project, including a reimbursement to the Government of Jamaica from CDB for \$120mm -- the cost overruns incurred on Phase 1 due to geotechnical issues. As a result, the project could finally proceed, with the added caveat that CHEC had permission to develop the land on parts of the corridor.

Phase 2 has run into some significant challenges. Jamaica's Office of the Contractor General issued a statement announcing that Phase 2 of the project cannot be implemented on a commercial basis and highlighting problems in the deal struck with CHEC and the CDB. Unresolved environmental impacts have also arisen after Jamaica's National Environmental Protection Agency served notice of excessive sedimentation of the coastal ecosystem as a result of the silt, solid waste, and debris from construction along the Jamaica North South Highway (Caribbean Development Bank, 2017).

In the Democratic Republic of the Congo, China's \$6 billion "minerals for infrastructure" deal, signed in 2007, raised concerns among Western countries over China's quest to secure natural resources and political influence in Africa. It also raised fears of the spread of an unsustainable debt bubble. Chinese firms Sinohydro and China Railway Group Limited are building roads and hospitals in exchange for a 68% stake in the Sicominex copper and cobalt mine, one of the largest in Africa. CEXIM and other Chinese banks lent a further \$3 billion to develop Sicominex, with the loans to be repaid from mining profits. The

resource-backed infrastructure deal in the Democratic Republic of the Congo brought up many issues of corruption and bureaucracy (Ning et al, 2016; Reuters, 2015).

Another project in the DR Congo is the Inga 3 hydropower project: a \$12 to \$14bn project along the Congo River with a 4,800-megawatt power plant. This project involved the potential displacement of 35,000 people in its first phase (International Rivers, 2016). The World Bank had been involved in the earlier stages and in 2014 approved a \$73mm technical assistance grant aimed at supporting a government-led process for development of the project as a public-private partnership. The U.S. had abstained from the initial World Bank grant decision noting “significant implementation risks” and expressing concern that “at least one of the three pre-qualified consortia includes a company that is debarred from participating in World Bank Projects (US Treasury, 2014).” The World Bank funding was suspended in 2016 following “the Government of DRC’s decision to take the project in a different strategic direction to that agreed between the World Bank and the Government in 2014.” This was after the project had been transferred from the office of the prime minister to that of the president. Correspondence between the World Bank and the Government of the DR Congo “proved unsatisfactory and confirmed the Government of the DRC’s deviation from agreed-upon strategy for the Inga 3 BC development” per the World Bank’s 2018 report.

Cancellation of the agreement was based on the failure of the DRC government to provide evidence of taking the actions required for lifting the suspension. The total IDA disbursements under the project amounted to \$3.11 million, or 4% of the total grant. The African Development Bank (AfDB), through parallel financing, continued implementation of its support for the Inga 3 BC project through the Agency for the Development and Promotion of the Inga Project and is currently financing the Government’s Transaction advisers (World Bank, 2018).

Following an international tender, three consortia bid for the project: a South Korean led consortium that withdrew in March 2016, the Pro-Inga Consortium led by Spain's Actividades de Construccion y Servicios SA (ACS), and the Three Gorges consortium led by Sinohydro (part of the consortium that built China's Three Gorges Dam) (World Bank, 2018).

The government has requested combining the remaining Chinese and Spanish bids, and the financing remains unclear. Given China's heavy involvement in the DRC with the aforementioned "minerals for infrastructure" deal, speculation is that the Chinese-led consortium may be selected. The head of the Grand Inga Project, Bruno Kapandji, has stated that the Chinese companies could complete the project in a "maximum of five years and if they're free to do whatever they want to do they can even do it in four years" (ESI Africa, 2016; International Rivers, 2016).

The Western approach, more specifically the US approach, toward this project has been quite fragmented, with no lead agency designated to take responsibility for a go-ahead decision. Because its internal structure encourages lower risk, clean energy projects, the World Bank has tended to avoid hydropower projects. The US government, under President Barack Obama's Power Africa Initiative and the Electrify Africa Act of 2014, focused on access to electricity for Sub-Saharan Africa with plans backed by bipartisan legislative support. However, the initiative lacked resources and backbone and essentially no new funds were allocated (see below).

In Uganda, the Ministry of Energy and Mineral Development signed loan agreements with CEXIM, part of which were subsidized loans for the construction of the Karuma and Isimba hydropower projects. CEXIM would lend 85% of estimated project costs, and the remainder would come from the Government of Uganda. The conditions associated with the loan included using a Chinese contractor to deliver the project as a turnkey project, i.e.

without continued operations and maintenance services. The estimated construction time was 6 years. Karuma is being delivered by Sinohydro and Isimba by the China International Water and Electric Corporation. In both hydropower projects, numerous quality issues and corruption claims have arisen, including structural defects reportedly at 2 billion USD.

These project-level results are emblematic of broader trends in developing economy infrastructure lending. In the Jamaica case, China took over part of a project that the Western consortium had abandoned because of a forecast that it would prove uneconomic. The forecast proved true, and whether China will recoup its investment remains unclear. In the case of the DRC, Western investors, while interested, ultimately decided that the political risks of the project precluded going ahead. Finally, the dam projects in Uganda simply would not have been supported by an international agency, given the environmental opposition from Western NGOs to any large hydroelectric project. They were financed by China instead.

Evidence from these cases is, of course, anecdotal and meant to illustrate some of the problems associated with Chinese projects, as well as the reasons that many developing nations have turned to China to finance infrastructure projects. Testing our hypotheses against broader sets of project data remains difficult, however, in part due to a lack of aggregate reporting on individual project lending data by China's policy banks.

One of our expectations of the Chinese approach to infrastructure development is that initial investments in a host nation would naturally lead to follow-on projects within the nation, irrespective of benefits from the initial project to either the host nation or the bilateral lender. We would also expect an accelerating string of projects over time that could produce synergies with one another. The downside would be a parallel increase in the debt servicing burden of the projects, and growing dependence by the host nation on China. In China's internal buildout of infrastructure, the externalities are captured internally. In their export of this approach, the extent to which the externalities (both positive and negative), as well as

follow-on projects, are captured by China and its state-owned enterprises is fundamentally different and poses a key risk moving forward.

The case of infrastructure investment in Sri Lanka provides a glimpse of this trend at the national level, and across multiple administrations. President Mahindra Rajapaksa's assumption of power in 2005 was shortly followed by major infrastructure investments financed by Chinese policy banks, including multiple investments in a large coal-fired power plant in Norocholai and more than \$1.3bn in total financing. Over the next decade, more than \$4bn was invested in highway projects across the country, and major port investments at Hambantota and Colombo were made between 2008 and 2015. In 2014, the Colombo Port City project began construction on development of a \$1.5bn industrial city near the Port of Colombo. All the projects in this rapid buildout were financed by Chinese policy banks—predominantly CEXIM—and all were constructed by Chinese state-owned enterprises. Even this understates the extent to which supporting projects were pursued. Other Chinese investments included cricket stadiums, industrial projects, and an international airport near the Hambantota port.

The rapid series of projects financed and developed in Sri Lanka illustrates the focus on speed of implementation in the Chinese paradigm, as well as the pressure to support concessional or underperforming projects with follow-on investments until the system is profitable. While some economic benefits have been cited from the string of infrastructure projects, ample evidence also suggests that some of the projects have destroyed economic value or created friction between partners. Although Chinese media have carried reports of the economic benefits of the Norocholai power plant, local media have reported more than 20 breakdowns and other plant failures, leading to significant losses by the national utility (Wijedasa, 2014). The massive container port projects, airport, and highway projects in the Hambantota region are particularly problematic given that they were built in a largely

unpopulated part of the country (which also happened to be President Rajapaksa's home region). The airport that was financed in the region has been cited as perhaps the least-trafficked airport in the world (Shepard, 2016), and the regional roads were reported to have greater elephant traffic than automobile traffic (Larmer, 2017).

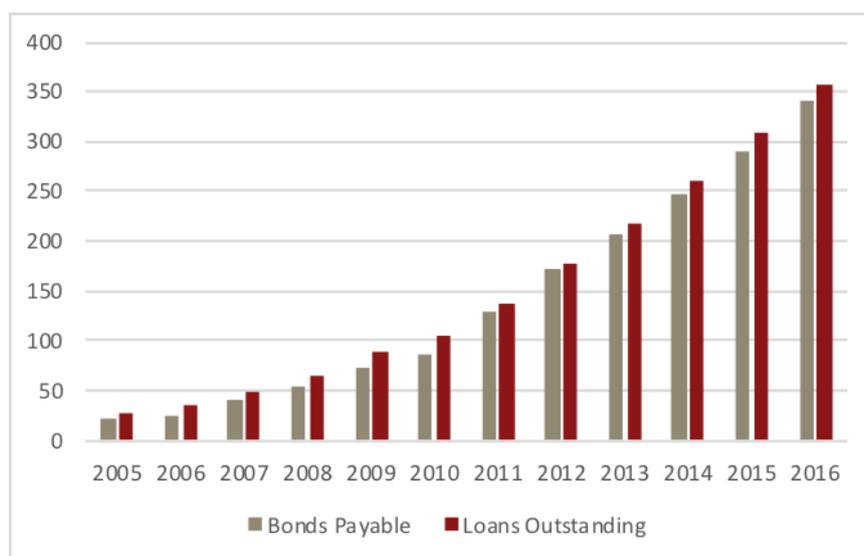
When President Maithripala Sirisena took office in 2015, problems with Sri Lanka's program of Chinese investment were exposed and investigated. Sirisena at that point was thought to be a more pro-Western leader who sought to roll back many of Rajapaksa's increasingly authoritarian and corrupt tendencies. Among these was Sri Lanka's high degree of dependence on China. None of the projects developed and financed by Chinese policy banks under Rajapaksa underwent competitive procurement, and little public information was available on the loan terms and the extent of Sri Lanka's indebtedness. It further surfaced that many of the infrastructure loans had recourse not only to the cash flows of the projects, but were under a sovereign guarantee by the Sri Lankan government. In total, Sri Lanka's debt to Chinese policy banks totaled more than \$8bn (Moramudali, 2017).

Thus following the change of regime, despite some efforts to disengage from China, the Sri Lankan government continues to invest in the relationship with Chinese state-owned firms and policy banks. The Colombo Port City project was originally halted for environmental reasons, but the Sirisena administration agreed to move the project forward under a new development agreement in 2016 (Mooney, 2016). In 2017, the Sri Lankan government, unable to service the debt on the struggling Hambantota port project, agreed to cede operations of the port to a state-owned Chinese firm under a 99-year lease in exchange for debt restructuring. The Sri Lanka case has prompted discussion on China's use of sovereign debt for geopolitical purposes. Now dubbed "debt-trap diplomacy" – collateralizing loans by strategically important assets, particularly those associated with the Belt and Road Initiative, has raised concerns (Chellaney, 2017).

CHINESE FINANCE IN THE AGGREGATE

Taken in aggregate, China's approach to infrastructure development has resulted in astonishing growth in the lending portfolios of China's policy banks. Here the CEXIM serves as a good example, given that their lending portfolio is oriented exclusively to projects and industrial lending outside of China. Between 2005 and 2016, the balance of loans outstanding increased at a combined annual growth rate of more than 26% (China EXIM, 2006-2016). Between 2014 and 2015, the CEXIM's total assets surpassed those of the World Bank's main development lending arm – the International Bank for Reconstruction and Development (IBRD) (World Bank).

Figure 2: China Exim Bank Loans Outstanding and Bonds Payable (USDbn)

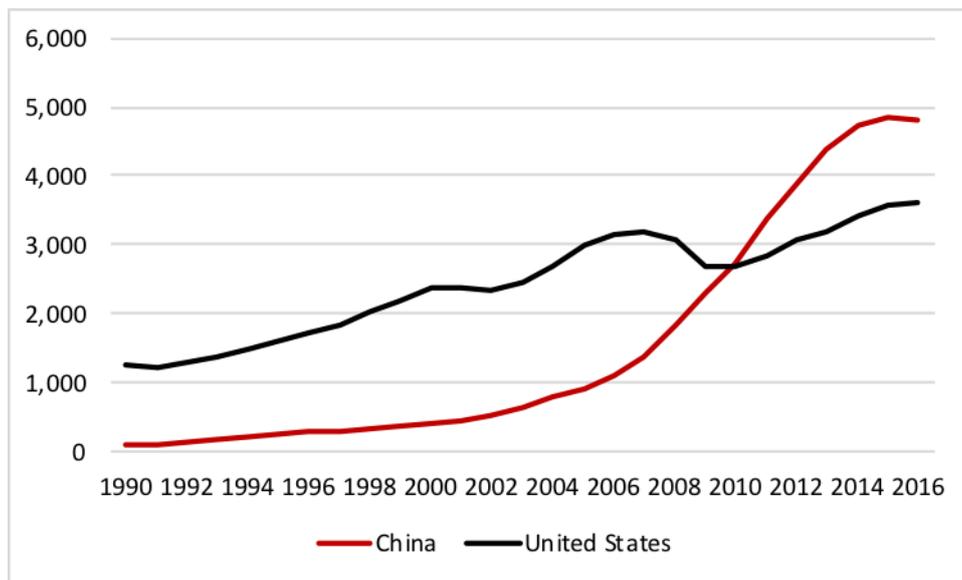


Other metrics further differentiate the practices of the CEXIM from those of the IBRD and other western lending institutions for infrastructure. For example, net loans outstanding is a much larger component of the total assets for CEXIM when compared to the IBRD, averaging 74% of total assets between 2012 and 2016, compared to 43% at the IBRD (World Bank). Illustrative measures of transaction costs provide an even starker contrast between the two institutions. Taken as a percentage of loans outstanding, administrative costs at the IBRD were more than *ten times* the administrative costs to loans outstanding of

CEXIM in 2016. If some of that differential is explained by the fact that the IBRD is a multilateral institution, the comparison also largely holds for western bilateral lenders. The US Export-Import Bank, which manages a lending program miniscule in comparison to CEXIM, still reported more than five times the administrative costs per loans outstanding when compared to CEXIM that same year (China EXIM). This indicates that the Chinese lenders are either vastly more efficient in making lending decisions, or simply devote fewer resources to due diligence and other administrative activities.

Booming infrastructure investment is often reported as a major component of China's domestic economic growth, but many studies of regional infrastructure investment have also produced decidedly mixed results on the question of whether higher levels of infrastructure investment help or hinder long-term growth (Shi, Guo, & Sun, 2017). Other microeconomic studies of project outcomes for Chinese domestic infrastructure have further indicated that overinvestment could be destroying economic value, rather than creating it (Ansar, Flyvbjerg, Budzier, & Lunn, 2016). China's domestic infrastructure binge began in earnest in 2000, as gross fixed capital formation began outpacing GDP growth and increasing steadily as a component of the Chinese economy. By 2010, gross fixed capital formation within China surpassed that of the world's largest economy, the United States, and it continued climbing through 2015. Between 2010 and 2015, gross fixed capital formation increased from approximately 35% of the Chinese GDP to more than 45% (World Bank, 2017).

Figure 3: Gross Fixed Capital Formation (current USD\$bn)



This massive buildout in domestic infrastructure coincided with a significant increase in local government debt within China. Some reports indicate that China's total debt increased from approximately \$2.1tn in 2000 to more than \$28.2tn by 2014, or 282% of GDP – levels higher than in other developed economies like the United States and Germany (McKinsey Global Institute, 2015). While much of this debt growth was attributable to households or state-owned enterprises, the period since the global recession saw a marked rise in Chinese local government debt, which, according to the National Audit Office, more than doubled between 2010 and 2014 from RMB 10.79 trillion to more than RMB 24 trillion (Wu, 2016). By 2014, the need for reforms to rein in local borrowing and avoid a string of defaults was clear.

The Chinese government would spend 2014 and 2015 reforming local government borrowing for infrastructure and refinancing bad debt. The national government's first attempt came in 2014 and included three broad initiatives: 1) requiring an audit by each province to account for the extent of their indebtedness due at the end of 2014, 2) capping local government borrowing from banks and completely ceasing Chinese local government financing vehicle (LGFV) borrowing, gradually converting it to clearly government or

enterprise-related debt, and 3) swapping a significant portion of local government debt coming due to long-term general obligation bonds.

In the spring of 2015, the Ministry of Finance changed its approach to mandate that the local banks holding most of the local government debt refinance it at “negotiated” very low interest rates. To further incentivize the banks to cooperate, the national government made it clear that additional government deposits would be tied to participation in the refinancing program, and the central bank also declared that it would recognize any refinanced debt as collateral in future lending or debt restructuring. On the surface, the reforms worked. Local governments were able to refinance into long-term, low interest loans with an implicit guarantee from the national government (Naughton, 2015).

If China’s reforms in 2015 were successful in averting catastrophe, it should also be noted that they did not provide an incentive against excessive borrowing to finance infrastructure stimulus. In 2017, infrastructure investment was continuing to grow as a percentage of overall fixed-asset investment and as a component of the Chinese economy (Wildau, 2017), and concerns over the use of various forms of off-balance sheet borrowing and other loopholes by local governments continued to mount (Jia, Ministry plans rules to curb PPP misuse, 2017).

China’s experience with infrastructure development and deleveraging at home provides an important parallel in assessing its international investment, with a few critical distinctions. The first lies in the capture of infrastructure’s externalities. One of the motivations for China’s approach to infrastructure is the creation of a portfolio of beneficial projects, even when the individual projects create no net economic benefits. China’s policy makers assume that infrastructure projects will generate beneficial externalities which can be captured by other projects or the local economy generally. Investments in a port project are serviced by the roads and rail projects linking to them, which are serviced by manufacturing

from industrial parks in regions made livable by water treatment facilities and access to airports or HSR. Each of these investments generates positive externalities captured by the others. Ultimately, in the case of infrastructure networks built within China, the network externalities all benefit the local economy and government.

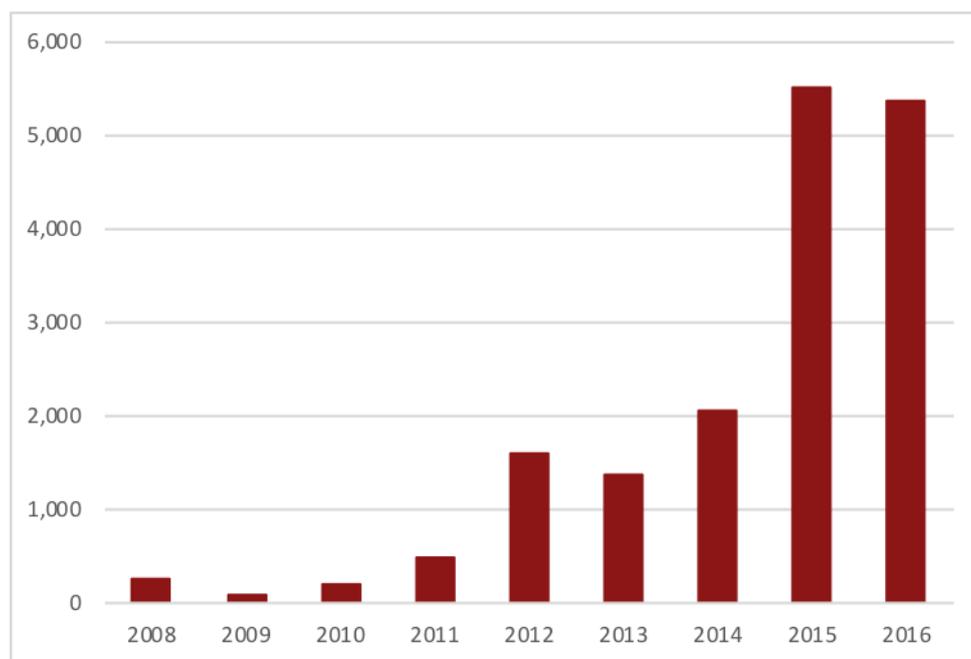
The situation outside of China is very different. China's policy banks may finance multiple projects in a region, but the reliance on externalities to create a "rising tide" is less straightforward. Externalities may be captured by the Chinese state-owned firms or policy banks investing in projects in the region, or they may be captured by the nation hosting the projects. Alternatively, China may feel that the externalities are not economic, but rather political and lie in the foreign policy influence that their projects generate. In either case, the dynamics of the relationship between the investor and investee are fundamentally different from those in China's national investment programs.

The second key difference is that the counterparties receiving China's investments abroad are not provinces operating in a semi-controlled hierarchy under the Chinese national government. They are sovereign nations. When bad debt for infrastructure piled up at home, the Chinese government was able to work out a solution between banks and local governments in part because it controlled all the parties. That is simply not the case abroad, and China's options will be limited should bad debts accumulate for the projects and host nations that its policy banks finance. We are past the age in which great powers can send gunboats to collect on bad sovereign debts.

The implications of these differences extend beyond the anecdotal conflicts with host nations highlighted in the investments discussed above. Despite a lack of performance data for individual loans and projects, signs of problems with China's investment programs are emerging in aggregate. Figure 3 shows CEXIM's reported loan impairments, negligible in 2008 but jumping to more than \$5bn per year in 2015 and 2016 (China EXIM, 2006-2016).

In 2015, China’s Ministry of Finance made a cash infusion of more than \$90bn split roughly evenly between its two policy banks – the CDB and CEXIM (Jia, 2015). The injection was billed as part of a broader reform package for China’s policy banks, but it also illustrated the differential performance between the banks’ investments at home and abroad. The injection reportedly improved both banks’ capital adequacy ratios, but the CDB, which focuses on lending within China, had a ratio of just under 9% prior to the injection. The CEXIM, which lends exclusively outside of China, had a capital adequacy ratio of just 2.26% prior to the injection – a level well below the Basel requirements for lending institutions.

Figure 4: China Exim Bank Loan Impairments (USD\$bn)



The problems highlighted above and the difficulty China’s policy banks and host nations have in quantifying the extent of bad debt illustrate one of the most significant flaws of the Chinese approach to infrastructure investment, at least in practice to date – a lack of transparency. While China’s approach reduces transaction costs and promotes projects significantly faster, the lack of transparency significantly increases the potential for negative project outcomes. Most infrastructure projects financed by China’s policy banks have been

implemented via direct negotiation between the banks, Chinese state-owned enterprises, and the host nation. Often the actual terms and requirements of the loans are unclear, including, most importantly, whether or not they are recourse to only the projects themselves or come with a sovereign guarantee from the host nation. This renders it difficult for host nations to quantify the extent of their indebtedness, and may also impair efforts of China's policy banks to accurately assess their risk-weighted liabilities.

WESTERN FAILURES

In pointing to the weaknesses of the Chinese approach to infrastructure investment, we do not mean to imply that the Western approach constitutes a gold standard to which all international development institutions should aspire. The Chinese have claimed a very large share of global investment due as much to weaknesses in Western approaches as to their own virtues.

The World Bank's environmental review and safeguard processes provide a good proxy for the rate by which well-meaning reviews and procedures can grow increasingly cumbersome and prohibitive. While the World Bank first created modest environmental review and mitigation procedures in the 1980's, the programs evolved considerably in the 1990's and early 2000's. In 1991, the Bank began mandating institutional capacity strengthening for borrowers in order to meet the Bank's Environmental Assessment (EA) requirements for every project it lends to. Still, throughout the 1990s the Bank faced difficulty in getting "buy in" and ownership from host nations in completing EA's and, more importantly, compliance with environmental mitigation measures once projects were in operation.

Despite these challenges, the Bank's internal assessments during this period largely framed problems in implementing its environmental procedures as issues to be addressed by its borrowers, rather than the bank itself. "Accordingly, it is profoundly unsettling if a project

proponent questions the need for an EA. When it comes to the crunch proponents may ‘accept’ to get an EA done if they want international finance. But ‘acceptance’ is not enough. It shows lack of political will, which suggests there will be problems in effective mitigation after the loan has been signed or after the project has been built.” (Goodland & Mercier, 1999)

By the early 1990s, the Bank was experimenting with policies that would further ingrain environmental and social reviews into its project assessment procedures by adding “Environmental Valuation” into the Cost-Benefit Analysis (CBA) completed by the Bank for its projects. Bank staff and prospective borrowers would attempt to quantify environmental factors and translate them into dollar terms when analyzing an individual project. This practice proliferated in the late 1990s. While a 1995 review found that only one project in a sample of 162 attempted an Environmental Valuation, a 2003 review of the practice found that more than a third of the projects sampled included an environmental valuation, a rate “still in many ways disappointingly low.” (Silva & Pagiola, 2003) As the Bank’s environmental review procedures continued to expand, an industry of Western Non-Governmental Organizations (NGOs) developed in parallel to advocate for the cancellation of or changes to potential Bank projects. Advocacy groups lobbied the Bank itself and, perhaps more importantly, the governments of its western donor nations, leaving the Bank to navigate between local political interest groups in host nations and protestors back at home for the projects it aimed to finance (Mallaby, 2009).

Over time, the World Bank’s increasingly cumbersome environmental review programs had a measurable negative effect on the bank’s lending programs. The Bank reported a marked decrease in lending to middle income countries throughout the 1990s and, despite a brief surge following the 1997 Asian Financial Crisis, lending dropped even further in the early 2000s. Throughout the 1990s, the bank markedly shifted from infrastructure

project lending to lending to social sectors, and further underwent an “institutional culture shift” from a focus on the “business of lending” to a focus on its functions as a “knowledge bank.” While several factors contributed to this trend, one was clearly the “excessively rigorous and demanding fiduciary and social/environmental safeguards attached to Bank projects” which “slowed down bank lending and increased its effective cost to borrowers.” (Linn, 2004)

By 2010, and despite a second lending surge following the Global Financial Crisis, the world’s largest infrastructure lending institution had largely exited the business of infrastructure lending. In real terms, lending commitments from the IBRD declined from an annual average of more than \$25bn in the 1980’s and 1990’s to \$16.6bn between 2000 and 2009 (Currey, 2014). By then, other infrastructure finance institutions (such as the Chinese policy banks) were actively replacing and competing with the World Bank to finance developing economy infrastructure. The World Bank’s impediments to lending were, in fact, becoming an existential threat to the institution itself – Operating Income, which the Bank largely derived from loans and which it used to fund its staffing requirements, was dwindling. By 2013 the IBRD’s loan income, for instance, was less than a third of its levels in 1990 adjusted for inflation (Currey, 2014).

A 2010 review of the World Bank’s environmental and social safeguard policies highlighted the need for change. The report called for a new comprehensive environmental and social policy to replace the piecemeal policies that had gradually developed at the bank. This would be accompanied by lending reforms proposed for more “programmatically lending” in which host nation assessments received increasing emphasis as opposed to individual project assessments. The Bank was also implementing a pilot program using host nation systems of environmental safeguards for projects rather than applying the Bank’s top-down policies. Additionally, the review highlighted some important trends in the Bank’s

environmental review practices and costs. For example, from 1999 to 2008, the Bank's projects underwent significant classification-creep in determining the levels of environmental impact and thus the necessary scope of the environmental review. During that period, the percentage of "very high impact" projects, which require the highest level of environmental review, increased from 5% to 11% of the Bank's project evaluations. "Substantial impact" projects increased from 37% to 51% of evaluations, while "low impact" projects decreased from 40% to 18% of projects. The report estimated that, in aggregate, the Bank's client costs in meeting safeguard policies averaged at about 5% of World Bank financing. These costs were borne primarily by the project sponsors, rather than by the Bank. The study further found that 38% of Bank clients avoided projects or dropped components to avoid the Bank's safeguards, and 18% reported revising a project's scope to avoid classification as a "very high impact" project (Independent Evaluation Group, 2010).

Following the 2010 report, the World Bank worked to implement reforms in its environmental and social safeguards programs and to increase its lending to infrastructure projects. These reforms have been successful by some metrics—infrastructure lending by the bank has increased markedly over the last few years. However, the environmental policy reforms have become something of a metaphor for the Bank's difficulties in implementing and approving new initiatives. The new Environmental and Social Framework has been more than six years in development, for what is effectively a review of the environmental and social review policies. According to the Bank, the new framework underwent "the most extensive consultation the World Bank has ever had." The Bank developed a series of draft Guidance Notes for the implementation of the new framework, and the comment period for Bank stakeholders and NGOs ended in late 2017. The new framework, launched in October 2018, now applies to all new World Bank investment projects (World Bank ESF, 2018).

In addition to the broad Western emphasis on safeguards and safeguard compliance, there are other weaknesses in specifically American politics and policy that prevent the United States from effectively competing with China in the provision of infrastructure to developing countries. An example is the Obama Administration's signature infrastructure initiative, Power Africa.

Following a visit to Africa in 2013, President Obama announced a new energy initiative that he hoped would lead to the investment of \$7 billion in US government resources and \$9 billion from the private sector (Olorunnipa and Alake, 2016). The original goal was to provide 10,000MW of power and to electrify 20 million new households in sub-Saharan Africa in five years, with even more ambitious goals set for 2030. This announcement was followed in 2015 by a complementary Electrify Africa Act passed by Congress, promising 20,000MW and 50 million connections by 2020 (Leo and Moss, 2017). The idea behind Power Africa was that the government would use its resources to mobilize private sector investment through loan guarantees provided by institutions like the Overseas Private Investment Corporation (OPIC) and the US ExIm Bank.

The implementation of Power Africa, however, met with numerous obstacles. The first arose from the structure of the US government. While the initiative had presidential backing, authority was spread over nearly a dozen US government agencies. USAID was in theory the lead agency, but it had no power to force interagency compliance; its administrator did not even hold Cabinet rank. Secondly, the initiative was trapped in the broad partisan gridlock that overtook the US Congress as a whole. The conservative wing of the Republican Party was trying to defund OPIC and the ExIm Bank altogether, and opposed any new spending on foreign assistance. As a result, the Electrify Africa Act, though passed with bipartisan support, did not allocate any new resources to the initiative. The Obama Administration hoped to encourage public-private partnerships, and while it did perform a

coordinating function that led to some small new projects like the Corbetti Geothermal Project in Ethiopia or the Lake Turkana Wind Power project in Kenya, by 2016 these efforts had achieved only 5% of the promised 30,000 MW (Gasparro, 2018). Needless to say, the Trump Administration has not made Power Africa one of its own priorities.

CONCLUSIONS

Is the newly dominant Chinese model a better approach to infrastructure development for host nation borrowers or even China, for that matter? It is true that China is actually performing what Western governments have promised and, in the past, delivered: the provision of roads, electricity, railways, ports, and other facilities necessary for economic growth. The US Power Africa initiative identified a clear development need, and then failed to deliver significant tangible results. Over the same period, China invested some tens of billions of dollars in infrastructure in sub-Saharan Africa.

On the other hand, this infrastructure has come at a significant price. Loans by China's policy banks are generally characterized by a lack of transparency; a majority of their projects have been implemented via direct negotiation. Often the actual terms and requirements of the loans are unclear—including, most importantly, whether they come with sovereign guarantees or are “nonrecourse,” which would mean the loan is secured only by the project itself, and the lender would be on the hook if it should default. This ambiguity renders it difficult for host nations to quantify the extent of their indebtedness and may impair the efforts of China's policy banks to accurately assess their risk-weighted liabilities.

If the true objective of China's lending programs is to build influence internationally, these programs have arguably been largely ineffective on that front as well. Today many of the nations that are the largest recipients of Chinese lending have the poorest, rather than the best, bilateral relations with China. High levels of Chinese investment in Sri Lanka, Myanmar, and Ecuador provide the starkest example, as local agencies mired in debt have

generated a substantial backlash. Many South Asian nations that are among the largest recipients of Chinese Belt and Road lending have shifted to realign strategically with India, Japan, or the United States.

Western lending institutions should do more than simply wait for China's lending programs to run their course. Multilateral infrastructure lending institutions must be restructured, in light of the fact that they are no longer the only viable alternative for borrowers. The next iteration of Western development lending should promote transparent, competitive procurement, nonrecourse financing without hidden sovereign guarantees, and streamlined safeguard processes, without imposing overly onerous requirements on host nations eager to move their projects forward. The alternative to their participation may be the very same project, lacking the safeguards and analysis that Western institutions are trying to promote. The onus of enforcing those requirements should lie with the host nations themselves. In order to actively move international projects forward, Western lending institutions must be protected from their own domestic politics.

The United States, for its part, is crippled by its own budget deficits and by partisan gridlock. In late 2018, in direct response to China's emerging dominance of international infrastructure lending, the US Congress passed the BUILD Act, which reforms OPIC and parts of USAID to create the US International Development Finance Corporation (USIDFC). The new institution will offer recently developed programs to support private market solutions in international development and, at \$60bn, more than double the funding cap allotted to OPIC. This is a welcome step toward the reforms necessary to support developing economies with options aside from China and, for that matter, to help US companies competing with Chinese state-backed financing overseas. Yet US programs still pale in comparison with those of China's international lending institutions. While Japan, India, and

other countries competing with China have sought to promote their own infrastructure projects, they too face resource constraints and bureaucratic obstacles.

Reforms would not necessitate a “race to the bottom” by development institutions for infrastructure. Today Western development institutions are hamstrung to the point that they can no longer further the goals for which they were created. China is simply filling the gap.

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