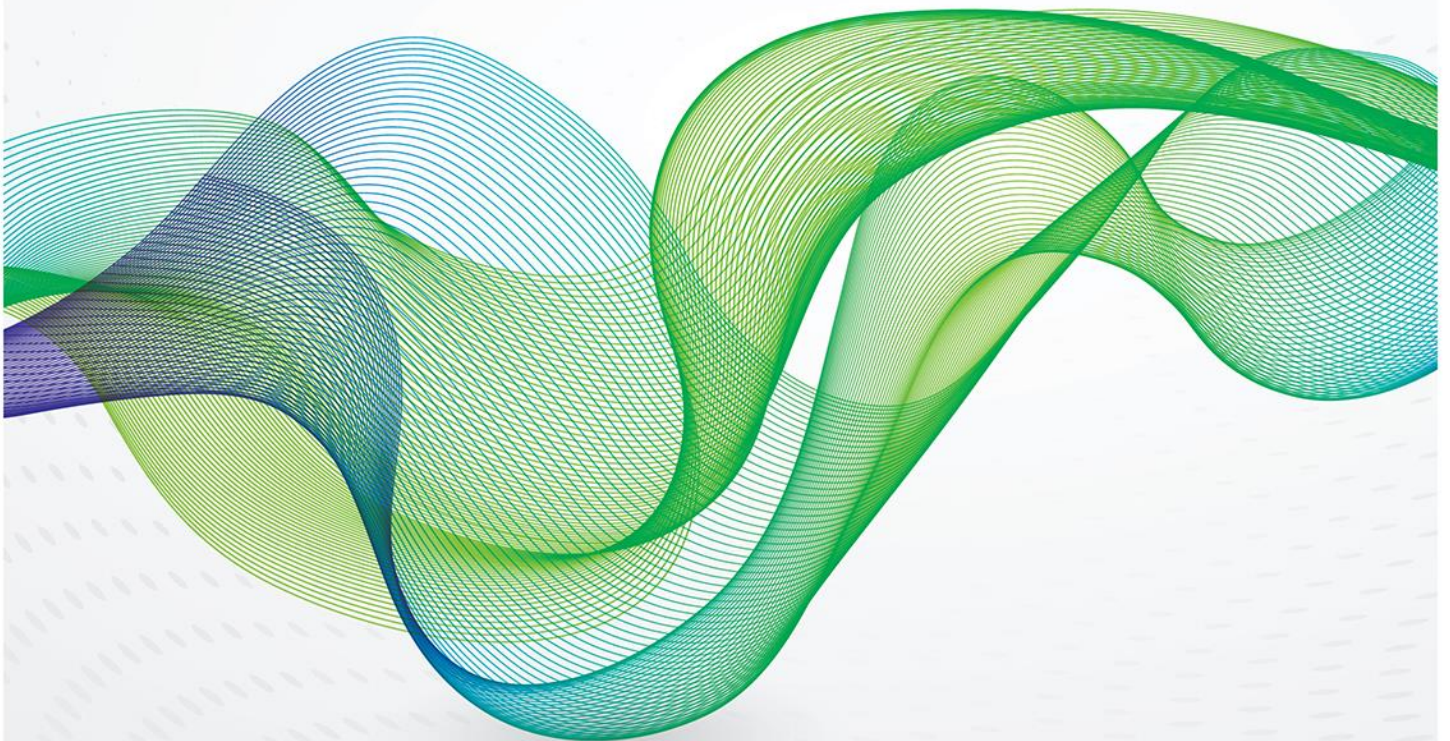




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China's loans for oil: asset or liability?



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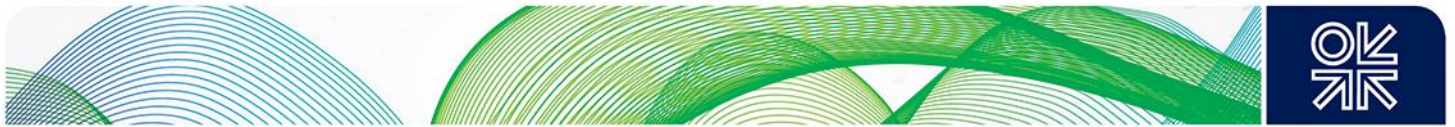


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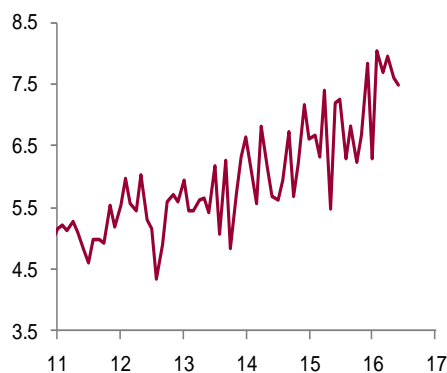
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1. Introduction

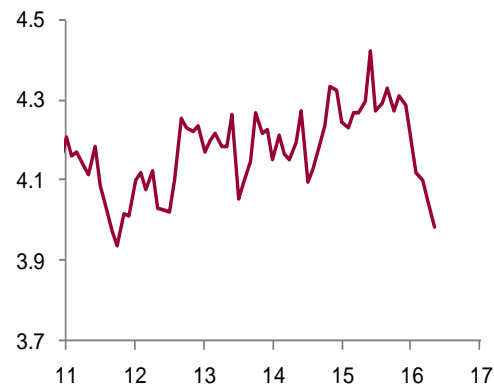
Over the past decade, as China's crude oil imports surged from 2.5 mb/d in 2005 to 6.7 mb/d in 2015¹ (see Figure 1), the country's leaders became increasingly concerned with the economic and strategic vulnerabilities associated with import dependence. Rising volumes of crude purchases represent a heavy financial toll on state coffers, while the risk of a supply cut-off, mainly by China's strategic rival, the US, has been a growing preoccupation. Chinese officials have been worried about the US's naval supremacy and its de facto dominance of key strategic trade points, especially the Straits of Malacca—through which around 85% of China's own commodity imports transit². With China's domestic production also declining (see Figure 2), imports will inevitably rise further, exacerbating these strategic vulnerabilities.

Figure 1: Chinese crude oil imports, mb/d



Source: China Customs

Figure 2: Chinese Domestic production, mb/d



Source: NBS

In light of this, Beijing has sought to hedge against supply disruptions and ensure a steady flow of oil supplies by supporting its national oil companies' (NOCs) investments in oil and gas fields overseas, as well as by offering loans to producer countries which are repaid with oil. Often, the two have gone hand in hand: Chinese policy banks have awarded credit lines to recipient countries that they have used for infrastructure development in return for exports of crude to China. Similarly, the NOCs, which had limited access to capital during their initial outbound investments in the late 1990s and early 2000s, developed new project financing structures whereby the loans to finance their upstream investments were secured by equity from these assets³.

As a result, by 2015, Chinese NOCs' participation in overseas production reached 1.7 mb/d (see Figure 3), and oil-backed loans generated an additional estimated 1.4-1.6 mb/d of crude that is available to Chinese traders⁴. To be sure, not all these barrels make their way directly back to China, and China's upstream investments are under a number of different contract structures, leading to varying volumes of oil supplies made available to them, but from Beijing's perspective, its supply situation is looking less precarious.

¹ According to Chinese Customs data

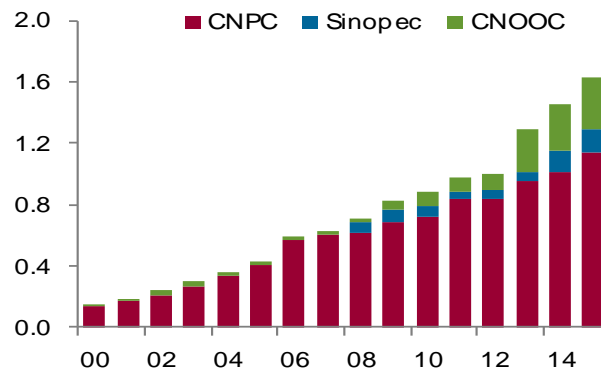
² See Michal Meidan, "The Implications of China's Energy-Import Boom", *Survival*, Vol. 56, no. 3, May 2014

³ Alex Vines, Lillian Wong, Markus Weimer and Indra Campos, *Thirst for African Oil Asian National Oil Companies in Nigeria and Angola*, Chatham House, August 2009, available at https://www.chathamhouse.org/sites/files/chathamhouse/r0809_africanoil.pdf

⁴ Based on the authors' database



Figure 3: Equity output of CNPC, Sinopec and CNOOC, mb/d



Source: Company reports, Energy Aspects

Yet the fall in global oil prices since 2014 has complicated the picture. Output in China's largest loan recipients, such as Venezuela, is falling due to Capex cuts, while others, such as Ecuador and Brazil, are struggling to keep production flat, let alone grow it⁵. Plummeting revenues are also exacerbating the political tensions in China's top import destinations, including Iraq, Venezuela, and Angola. So as production levels become increasingly difficult to sustain, and governments are working their way through two years of declining oil incomes, debt repayment is a growing concern. But after investing so heavily, Beijing has few options but to maintain support for these countries in a bid to sustain oil production, at least enough to ensure loan repayment and equity output.

2. Energy security 1.0: 'Going out' for oil

Chinese companies made their first steps into international oil and gas upstream in the early 1990s. Their initial forays were extremely limited, and informed by their commercial strategies rather than by government mandate, since Chinese leaders regarded outbound investments with caution and as a potential financial liability. Yet after several successful deals overseas, in small assets in Canada, Peru, and Sudan in the early to mid-1990s, Beijing began viewing overseas investments as a strategic asset—as the realisation that China would become more dependent on imported crude than it had previously anticipated began to sink in⁶. In addition, frictions between China and the US across the Taiwan Straits in 1995-96 highlighted China's military vulnerabilities and the potential risks associated with greater reliance on sea-borne oil supplies. So, starting in the early 2000s, the government increased its support for the NOCs' efforts to invest in overseas upstream assets in the belief that in the event of conflict, Chinese equity oil could be shipped home. In addition, by developing resources in the Former Soviet Union and Latin America, Chinese decision makers sought to diversify their crude import sources away from the Middle East, thereby limiting China's exposure to instability there, as well as to the US presence along the trade routes between the Middle East and Asia.

Within less than two decades, China's main oil and gas firms have established a significant global presence (see Figure 4). Yet even though much of the emphasis in China in the early 2000s was laid

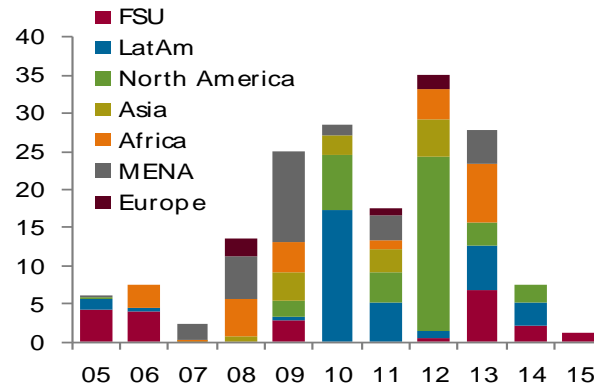
⁵ Bassam Fatouh, "Adjustment in the Oil Market: Structural, Cyclical or Both?", Oxford Energy Comment, May 2016, available at <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/05/Adjustment-in-the-Oil-Market-Structural-Cyclical-or-Both.pdf>

⁶ See China's Worldwide Quest for Energy Security, IEA, Paris: OECD, 2000, available at <http://www.oecdchina.org/OECDpdf/china2000.pdf>; Erica Downs. China: Energy Security Series, The Brookings Foreign Policy studies, December 2006, <https://www.brookings.edu/wp-content/uploads/2016/06/12china.pdf>; Michal Meidan, "The Implications of China's Energy-Import Boom", op. cit.



on the need to diversify import sources, and despite the billions invested in global oil markets, China still relies on Russia, Saudi Arabia, Iraq, Angola, Oman, and Iran for two-thirds of its imports. The difference is that China now produces some of the oil it imports in four of those countries—Russia, Iraq, Iran, and Angola⁷.

Figure 4: Upstream investments by region, \$ bn



Source: Company reports, Energy Aspects

Chinese outbound investments are not just about supply security—even though this has been the main rationale for the government. The NOCs pursued their overseas investments in a slightly more haphazard way, seizing opportunities as they presented themselves. In the late 1980s and early 1990s, as the government gradually reduced its direct financial allocations to the three main NOCs (CNPC, Sinopec, and CNOOC), their management teams were forced to assume responsibility for their own balance sheets. At the same time, the government maintained price controls on domestic products sales, making it difficult to profit from downstream operations. And, given the shrinking reserve-to-production ratios in the domestic upstream, the NOCs opted to invest abroad. Moreover, overseas acquisitions were seen as a means of distancing corporate activities away from government scrutiny⁸.

Each of China's three large oil companies has had distinct motivations and diverging strategies: for CNPC, 'going out' was about generating business for its oilfield service subsidiaries; making use of profits that it feared would be otherwise taxed by the government; and a way to gain overseas experience and assets. Fundamentally, however, it was not a supply security issue given that CNPC's refineries ran, for the most part, domestically produced crude. Sinopec, however, while seeking to expand its asset base, also wanted greater autonomy from CNPC's monopoly on crude oil pricing and supplies, given that most of the crude refined in Sinopec's refineries was allocated to it by CNPC⁹.

Yet in the early 1990s, China's NOCs struggled to gain access to good acreage. Although China's oil companies had developed considerably since the discovery of the large domestic fields in the 1960s, their technical prowess in exploration and production—beyond enhanced oil recovery, at which they were improving rapidly—was not their biggest selling point. Moreover, many of the best performing assets were already contracted, and the remaining fields were either too costly to explore under market conditions, or were located in countries with high levels of political risk. So the Chinese government's deep pockets helped secure the NOCs investments.

⁷ Ibid.

⁸ Michal Meidan, The structure of China's oil industry: Past trends and future prospects, Oxford Institute for Energy Studies Working Paper, May 2016, available at <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/05/The-structure-of-Chinas-oil-industry-past-trends-and-future-prospects-WPM-66.pdf>

⁹ Bo Kong, *China's International Petroleum Policy*, Praeger, 2009; Xu Xiaojie, Chinese NOCs' Overseas Strategies: Background, comparison and remarks, Houston: James A. Baker III Institute for Public Policy of Rice University, 2007



Sudan

For example, in September 1995, CNPC conducted its preliminary study of Sudan's oil blocks—at the invitation of President al-Bashir, as Chevron had pulled out of Sudan a few years earlier—and concluded that the fields in question were similar in their geology to China's Bohai Bay region. To support CNPC's business in Sudan, the Chinese government provided a preferential credit of RMB1.15 billion for oil exploration projects, to be used by Chinese companies, under the supervision of the Sudanese Central Bank. In return, CNPC would be allowed to repatriate profits with no restrictions, and would be exempt from all domestic taxes on exported oil.

For Khartoum, the main priority was to sustain output following the majors' departure, so its main requirement was for companies to be able to finance the development of its resources and to undertake the construction of an export pipeline. CNPC satisfied these requirements, and outbid the field by offering the government an oil refinery. Since then, CNPC has become the majority shareholder in a number of blocks and is also the major player in refining and pipelines. CNPC's equity output from Sudan has averaged 0.15 mb/d since 2010, falling from levels of 0.20-0.25 mb/d between 2005 and 2010, roughly equal to the 0.17 mb/d imported from Sudan into China since 2010. But of China's output in Sudan, which consists of the Nile, Dar, and Fula blends, mostly the Dar blend makes its way back to China and is processed mainly in Sinopec's coastal refineries while the Nile Blend is sold internationally.

With South Sudan gaining independence from the North in July 2011, disagreements over revenue sharing between Sudan and South Sudan have generated recurring instances of violence, leading to production shutdowns and a decline in output from its previous 0.45 mb/d level to an average of 0.24 mb/d in the first quarter of 2016. Chinese imports from Sudan and South Sudan combined peaked at 0.19 mb/d in March 2016, before falling to 0.12 mb/d in May¹⁰.

The collapse in global oil prices has only exacerbated existing tensions, and placed additional pressure on supplies. At the beginning of 2016, when oil prices hovered around \$30 per barrel, South Sudan, which pays its northern neighbour \$25 per barrel for oil transported through Sudanese territory, was left with no proceeds after deducting producing companies' shares. And with the peace agreement rapidly collapsing in a new wave of violence, there is little appetite to produce, and fields remain shut down. So, Sudanese and South Sudanese combined output may well decline further, thereby also capping Chinese equity output and limiting Sudan's future loadings to China and Asia.

Sudan, which was once the poster child of Chinese overseas equity, is now looking like a losing bet. Reserves in Sudan are declining, and the political situation shows no sign of improving. While CNPC is unlikely to divest from its Sudanese assets, it could seek to limit any further investments in the country. The fact that Sudanese crude only accounts for 2% of China's total imports will also be a consideration. Similarly, its contribution to Chinese oil produced overseas has fallen from over a third of CNPC's equity output in the early 2000s, to around 10% of it currently¹¹.

Angola

In comparison, a decline in output from Angola, which accounts for 12% of China's supplies, or Iraq, which represents an additional 11% of total imports and roughly two-thirds of CNPC's equity production, would be more detrimental¹². Angola is an increasingly important source of oil supplies for China because Angolan crudes meet the needs of Chinese refineries, which are configured to process domestic medium-sour crudes. And as China moves to higher specification fuel quality for its domestic products, refiners are also seeking to sweeten their crude slate.

¹⁰ Xu Xiaojie, Chinese NOCs' Overseas Strategies: Background, comparison and remarks, op. cit; Luke Patey, *The New Kings of Crude, China, India, and the Global Struggle for Oil in Sudan and South Sudan*, Hurst: 2014.

¹¹ Julie Jiang, Jonathan Sinton, *Overseas Investments by Chinese National Oil Companies: Assessing the drivers and impacts*, IEA information paper, February 2011

¹² CNPC company reports, the author thanks Luke Patey for his comments



The NOCs initial investments in Angola, much like in Sudan, were facilitated by concessional loans granted by the China Export-Import Bank (EximBank) for infrastructure projects in the country. The first \$1 billion loan in 2004, was granted at Libor plus 1.5%, and included a 0.3% commission, repaid with 10 thousand b/d at spot prices. In 2007, a second loan facility was negotiated for \$2 billion, for 15 years, and with a lower interest rate. This loan operated like a current account: the Angolan Ministry of Finance triggered a loan disbursement by China's EximBank directly into the accounts of the contractors. As soon as projects were completed, repayments began, and revenue from the oil was deposited into an escrow account from which the repayment amount was deducted to service the debt¹³.

In tandem with the Chinese credit line opening to Angola, Sinopec acquired its first stake in the BP-operated block 18. The project was jointly financed by Chinese and Western banks, and the newly created Sonangol Sinopec International (SSI) obtained a seven-year loan secured only by the asset and its equity. The offtaker was designated as Unipetec, Sinopec's trading arm. Output from block 18 was increasing, and Sinopec, with government support, went on to acquire additional offshore oil blocks, expecting their equity output to reach 1 mb/d within a matter of years. Simultaneously, Sonangol signed long-term offtake deals with Unipetec¹⁴.

But China's equity from Angola remained at an average 0.15-0.20 mb/d, despite Sinopec's additional upstream acquisitions, and this is likely related to recent revelations regarding inflated reserve estimates for the blocks Sinopec acquired in the country after 2008. In 2015, former Sinopec President Su Shulin was arrested for corruption linked to the company's Angolan investments, and more specifically, the use of middleman Sam Pa to broker them. In 2015, China's National Audit Office (NAO) launched an investigation into the \$10 billion that Sinopec International Exploration and Production Corporation (SIPC)—Sinopec's overseas investment arm—spent between 2008 and 2015 on offshore assets in Angola, including blocks 3/05, 31, and 32, as well as 15/06 and 17/06. They concluded that Sinopec had been pouring money into projects based on exaggerated estimates of oil reserves, and at the end of 2014, the NAO concluded that three of the five blocks had banked a net loss of \$ 1.6 billion¹⁵.

Loans that were granted in return for oil had greater success in ensuring oil supplies and accounted for roughly 0.2-0.3 mb/d of Unipetec's crude loadings to China last year. With long term off-take agreements in addition, Chinese traders only sell half the Angolan crude they load back to Sinopec's refineries, where it is processed in the company's southeastern refineries.

But with global oil prices falling, Angola faces a double challenge of maintaining its production levels while also servicing its debt to China, which will now require more barrels for every dollar of outstanding debt¹⁶. At the same time, with more oil sales earmarked for servicing debt and paying oil majors, Angola's state coffers are dwindling, forcing the government to turn, once again, to its largest creditor. In 2014, China agreed to lend Sonangol an additional \$2 billion to expand oil and gas projects, but several months later, Angolan President José Eduardo dos Santos was in Beijing asking for a moratorium on debt repayment. Angola's finance ministry also recently disclosed that Luanda had borrowed \$11.46 billion between November 2015 and June 2016, including \$5 billion from the China Development Bank (CDB) and \$2 billion from other state-backed Chinese lenders. This, in turn, likely led to the term contract signed between Sonangol and Sinochem at the end of 2015, which

¹³ Vines et al., op. cit.; "Angola Balances On Debt Tightrope", *International Petroleum Finance*, 9 September 2005

¹⁴ Lucy Corkin, *Uncovering African Agency: Angola's Management of China's Credit Lines*, Routledge: 2016

¹⁵ Brian Spegele, "China Probes Graft in Angola Oil Deals", *Wall Street Journal*, Yu Ning, Huang Kaixi, Yang Yanwen, "Businessman Linked to Sinopec's Angola Deals Said to Face Probe", *Caixin*, 14 October 2015

¹⁶ Libby George, "Growing Chinese debt leaves Angola with little spare oil", *Reuters*, 14 March 2016



could see Sinochem lifting as much as 0.2 mb/d of Angolan crude to supply its own refineries, as well as for the independent 'teapot' refiners that are now importing more crude oil¹⁷.

While the prospects of slowing production growth in Angola are worrisome for Chinese financiers, they still view Angola as a relatively safe investment. That said, now that more cargoes of Angolan crude are allocated to Chinese buyers, Sonangol has fewer spot cargoes to offer, meaning that the bulk of Angola's oil is now earmarked for repaying loans so the lack of cash from spot sales means investment will take a hit over the course of the next few years. On balance, even though China's equity investments have not fared as well as hoped, loans for oil and term deals are ensuring a steady flow of crude to China's refineries, and as long as China does not perceive substantial risks to Angola's production outlook, it may well be willing to roll over debt, or even forgive some.

Kazakhstan

The combination of oil and money has also proved extremely useful for Chinese investments in Kazakhstan. Much like in Sudan and Angola, CNPC's first foray into Kazakhstan, in 1997, was facilitated by state funding. CNPC purchased a 60% share in AktobeMunaiGas, the fourth largest oil and gas company in the country, beating a number of US and European majors to it, thanks to CNPC's pledge to pay upfront a \$320 million bonus to the cash-strapped Kazakh government, and to conduct a feasibility study on the construction of an 1,800-mile pipeline to Western China, which would also provide an export route into China, and away from Russia. While the project suffered a number of delays, it finally went through—only to be followed in 2003 by an additional 25% stake in AktobeMunaiGas. Two years later, CNPC was back in the market for a 33% stake of KazMunaiGaz (KMG) and in 2009, together with KMG, CNPC took over MangistauMunaiGas (MMG). In order to facilitate these deals, CNPC loaned KMG \$5 billion, \$1.3 billion of which was to allow the Kazakh state-owned oil company to secure its 50% share of MMG. At the same time, China's EximBank offered a \$5 billion loan to Kazakhstan, although there are few details about the terms of repayment of the EximBank loan, and it is unclear whether oil exports were used as collateral.¹⁸

A number of private companies including CITIC and Xinjiang Guanghui have also acquired upstream stakes in Kazakhstan, bringing Chinese firms' combined equity output to an estimated 0.30-0.35 mb/d. But the biggest and most significant deal that CNPC signed in Kazakhstan was the 2013 acquisition of an 8.33% share in the giant Kashagan oil project in Kazakhstan's Caspian Sea, which came with an additional \$3 billion to finance the second phase of development of Kashagan. This acquisition allowed CNPC to own a minor share of a giant project, in the largest oil discovery in the past 30 years. But the project has been mired in delays. After starting production in September 2013, some eight years after the original schedule, and tens of billions of dollars over budget, production was halted a few weeks later after gas leaks were detected in its pipelines, only to restart in October 2016¹⁹.

Yet despite China's growing equity production in the region and the strategic desire to develop land-based supplies, imports from Kazakhstan have hovered around 0.12-0.15 mb/d, rising above 0.2 mb/d between 2010 and 2012 before falling back (see Figure 5). Indeed, CNPC's equity oil from Kazakhstan is not all shipped back via the 0.2 mb/d pipeline. CNPC subsidiaries decide how the CNPC share of production from its holdings in Kazakhstan are marketed.

¹⁷ Christian Shepherd, Lucy Hornby, James Kynge, "China rethinks approach after surge in lending to risky countries", *Financial Times*, 13 October 2016; Libby George, Chen Aizhu, "Angola signs oil deal with Sinochem in bid for Chinese buyers", *Reuters*, 16 December 2015.

¹⁸ Julie Jiang, Jonathan Sinton, *Overseas Investments by Chinese National Oil Companies: Assessing the drivers and impacts*, IEA information paper, February 2011, https://www.iea.org/publications/freepublications/publication/overseas_china.pdf; Philip Andrews-Speed, Roland Dannreuther, *China, Oil and Global Politics*, Routledge: 2011; Philip Andrews-Speed, Xuanli Liao, Roland Dannreuther, *The Strategic Implications of China's Energy Needs*, Routledge: 2014;

¹⁹ Julie Jiang, Chen Ding, *Update on Overseas Investments by China's National Oil Companies, Achievements and Challenges since 2011*, IEA, 2014.



Figure 5: Chinese imports from Kazakhstan, mb/d



Source: China Customs

3. Investing in the Middle East: Easier said than done

Of the 1.7 mb/d of the Chinese NOCs upstream equity investments in 2015, around half likely makes its way back to the Chinese market, while the rest is traded: Angolan, Sudanese Dar Blend (rather than Nile Blend), and Iraqi crudes are for the most part sold back to China and processed in domestic refineries. Volumes from Latin and North American equity investments vary more considerably as a function of their prices and have become more appealing to refiners as they have grown in complexity. Yet over the past decade, Angolan crudes have been consistently in high demand, as are Middle Eastern grades given their compatibility with domestic refining configuration. So, given that Middle Eastern grades will remain the most important feedstock, Chinese companies are actively taking shares in the biggest suppliers that are open for investment. Iraq and Iran have been two of the NOCs prized investment destinations.

Iraq

Three Chinese traders, Sinopec, Sinochem, and Zhenhua oil, have all secured term agreements with Iraq's state-owned crude marketer, SOMO, for an estimated 0.4-0.5 mb/d, and Chinese companies have technical service contracts for their upstream investments for which they are repaid in oil, albeit at varying volumes. Chinese companies have been active in Iraq's oil sector since winning bids to service contracts together with IOC and NOC partners in 2009. CNPC is a partner in the consortium development of the Rumaila field and the operator of the Halfaya and Al-Ahdab fields, while CNOOC operates the Maysan oilfields, from which it lifts payment crude, at times back to China. Sinopec also produces oil in the Iraqi Kurdistan Regional Government (KRG) area following its acquisition of Addax Petroleum in July 2012. In 2013, PetroChina joined ExxonMobil by purchasing 25% of its share in Iraq's giant West Qurna 1 oilfield, which is 50 kilometres (km) northwest of the southern oil hub of Basra²⁰.

But with the government in Baghdad in turmoil, despite the surge in Iraqi production in 2015, and both the federal government in Baghdad and the KRG facing a deepening financial crisis following the fall in global oil prices, the prospects for additional upstream spending and production growth are limited. For instance, in Rumaila, Iraq's largest field in which CNPC is a minority partner, current production of around 1.35 mb/d will require a constant programme of drilling in order to offset the underlying decline rate of about 17% per year. This seems unlikely given that Baghdad has been forcing IOCs to lower investment budgets in order to reduce the repayments that it has to make to them. So output from

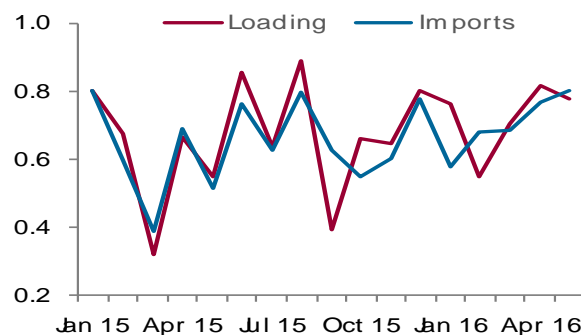
²⁰ *Ibid*



Chinese NOCs' current investments as well as prospects of production ramp ups in the near term will be limited²¹.

Yet the turmoil in Iraq has not reduced Chinese crude buying, on the contrary, overall, China's appetite for Iraqi crude remains high as OPEC producers vie for market share and offer attractive financing deals (See Figure 6). Thus far, PetroChina's 0.2 mb/d Qinzhou refinery in Guangxi province has been retooled to process high-sulphur Iraqi crude while Sinochem's 0.24 mb/d Quanzhou refinery in Fujian province replaced some of its Kuwaiti feedstock with around 0.10 mb/d of Iraqi crude. Other refiners along China's coastal provinces are also increasingly running Iraqi grades and Sinochem is gradually offering Basrah Light to the 'teapot' refiners. Around 0.5 mb/d of Iraqi crude has become baseload supplies to China, and can be expected going forward unless a substantial crisis takes large volumes of output offline²².

Figure 6: Chinese Loadings and imports from Iraq, mb/d



Source: Reuters and China Customs

Iran

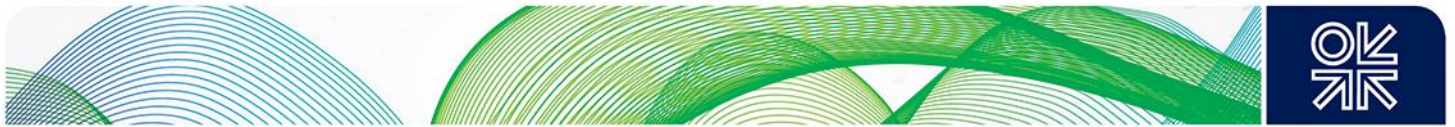
Iran's return to the oil market as sanctions are gradually being lifted continues to intensify the competition for market share between Iran, Iraq and Saudi Arabia. Iran is China's sixth largest oil supplier, accounting for 8% of imports and Chinese NOCs also have substantial investments in the Iranian upstream. In 2007, Sinopec signed a deal to develop the 85 thousand b/d Yadavaran field, followed in 2009, by CNPC's buyback deal with NIOC to develop South Azadegan. That same year, CNPC sealed an additional agreement to develop phase 11 of the South Pars offshore gas field but CNPC has been removed from both these fields due to slow progress on developing them. The company still holds its buyback agreement (also from 2009) for the 75 thousand b/d North Azadegan and Sinopec is planning to expand the Yadavaran field but the company seems to have been sidelined for future phases of the project²³.

Even though Chinese companies benefitted from the absence of Western companies under the sanctions regime, they were also hurt by the lack of IOC expertise: CNPC's exit from South Pars in 2012 was in part because critical equipment such as natural gas compressors from Western companies could not be shipped to Iran. Similarly, in 2014, the lack of development progress in Azadegan was related to CNPC's need for equipment and knowhow from Western partners as well as its fears that substantial developments in Iran would constrain its operations in the US.

²¹ Richard Mallinson, "Can Iraqi oil production surprise again on the upside?", *Oxford Energy Comment*, October 2016, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/10/Can-Iraqi-oil-production-surprise-again-on-the-upside.pdf>

²² Argus China Petroleum, June 2016

²³ Julie Jiang, Chen Ding op. cit. John Garver, *China and Iran: Ancient Partners in a Post-Imperial World*, University of Washington Press, 2006.

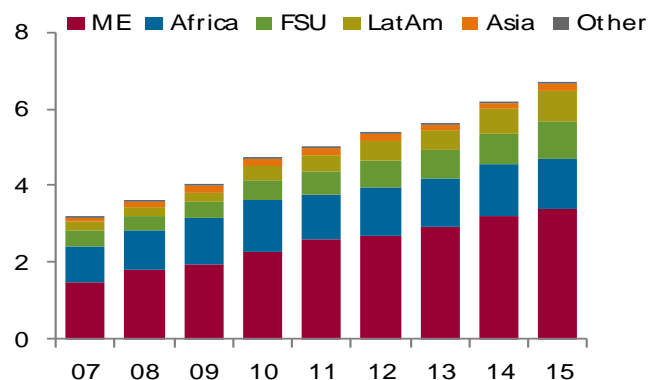


In the post-sanctions era, Tehran is keen to attract Western firms, which are still considered of higher technical standards than their Chinese counterparts and geopolitically, their return would be testament to the end of Iran's isolation. China's NOCs are aware of these risks, and Beijing will likely highlight to Tehran that Chinese funding—which was available to Iran throughout the sanctions period—remains on offer. This is a compelling proposition, but on balance, Tehran will likely opt to reduce Chinese firms' presence in the country in favour of Western firms when possible. But regardless of the fate of China's upstream investments in Iran, oil exports are rising and will likely outstrip the 0.53 mb/d that Chinese imported from Iran in 2015²⁴.

Source: China Customs

After two decades and billions of dollars in upstream investments, China's oil supply patterns have not materially changed. But the diversification of crude supplies has allowed China, at the margins, to cap its dependency on Middle Eastern imports as instability in the region, especially following the Arab Springs, further highlighted the risks to Chinese commercial interests. In this context, capping the share of imports from the Middle East and increasing the number of countries from which China can buy oil is seen as a significant achievement (see Figure 7).

Figure 7: Chinese imports by region, mb/d



Beyond the Middle East and Angola, however, another strategy aimed at enhancing supply security—the oil-backed loans—have reduced the share of African oil in the Chinese import mix in favour of crudes from Russia and Latin America.

4. Energy security 2.0: Loans for oil

Between 2009 and 2010, when credit was tight following the global financial crisis, the China Development Bank (CDB) extended lines of credit totalling almost \$65 billion to energy companies and governments in Brazil, Ecuador, Russia, Turkmenistan, and Venezuela. These loans were to be repaid with oil and already in 2010, Beijing had secured 0.75 mb/d in loan repayments. By 2015, lending generated an estimated 1.4-1.6 mb/d in oil. Although oil-backed loans were used before, they became increasingly popular after 2009²⁵.

Chinese upstream investments and loans for oil combined, now account for just under half of the country's total import flows. While equity investments in the 2000s mainly increased the volumes of oil from Africa, since 2009 the oil-backed loans, combined with production declines in Sudan and Angola,

²⁴ According to China customs data

²⁵ Erica Downs, Inside China, Inc: China Development Bank's Cross-Border Energy Deals, *China Center Monographs*, Brookings, March 2011, <https://www.brookings.edu/research/inside-china-inc-china-development-banks-cross-border-energy-deals/>



have helped increase the share of Latin America and Russian crude in China's import mix, even though in absolute terms, supplies from all regions have gone up. To be sure, the main recipients and host countries have at different times been plagued with political instability which has impacted their production, so the volumes earmarked for China have varied. In addition, Chinese investments are held under different contractual structures (buybacks, production sharing contracts and technical service agreements), so volumes of payment crude also fluctuate. Nonetheless, in 2010, almost 1 mb/d was available to China's oil traders to ship back home or trade, and in 2015, it was already 1.7 mb/d, at times at a discount to market prices²⁶.

Yet the collapse of global oil prices in 2014 highlighted a fundamental weakness in China's supply security strategy: its heavy reliance on a number of potentially fragile states. Falling oil prices have strained producer countries' finances, thereby increasing the risk of delays to loan repayments or even a default on their loans. That said, producing countries' dire financial situation has created new opportunities for China to grant new loans in exchange for oil and access to upstream, albeit under more stringent terms. While the risks for China are high, some of the loan structures are relatively flexible and since the main lenders are China's policy banks, which are state owned, the cost of their capital is determined by the state rather than the market. In addition, these loans are highly political in nature and therefore, depending on the political and diplomatic climate, could allow for deferred repayment schedules when needed.

While each deal has unique terms of repayment, all CDB deals were structured along similar lines, in an attempt to insulate CDB from risk: each oil-backed loan is secured by revenue earned from deliveries of oil or natural gas to a Chinese oil and gas company²⁷. For example, CDB grants a billion-dollar loan to an oil-exporting country like Ecuador. In return, Ecuador's state oil company, Petroecuador, pledges to ship oil to China every day for the life of the loan. Chinese oil companies then buy the oil at the pricing formula (often indexed to market prices, with discounted rates at times) and deposit their payments into Petroecuador's CDB account, from which CDB can withdraw the loan repayment as well as interest and associated fees directly²⁸.

Some of the oil-backed loan deals have also facilitated the NOCs' and other state-owned firms' involvement in the host countries, involving infrastructure projects (in Ecuador for example), upstream contracts for Chinese firms (Brazil), and some to the purchase of Chinese equipment (Venezuela, Brazil). Perhaps the most significant success of the oil-backed loans has been the opening up of the ESPO pipeline from Russia to China, and the subsequent increase of crude flows between the two countries.

The oil-backed loans were appealing to a number of stakeholders in China because they responded to a number of interests: first, they supported CDB's agenda, which included increasing the bank's own domestic profile and growing its international business. Second, the oil-backed loans advanced the government's goals of enhancing China's access to energy and diversifying China's foreign exchange reserves. Third, CDB's loans helped China's NOCs acquire assets abroad and establish diverse, long-term supply chains²⁹.

Even though the oil-backed loans were not an explicit government mechanism, they gained popularity and were endorsed by Beijing rapidly. Most projects originated from CDB or the government: the loan extended to Petrobras in 2009, for example, was initiated by CDB and rose to the attention of the central government, while the \$25 billion loans to Rosneft and Transneft that same year were initiated

²⁶ Author's database

²⁷ The most comprehensive studies of the energy backed loans include: Erica Downs, Inside China, Inc, op. cit; Kevin P. Gallagher, Amos Irwin, and Katherine Koleski, *The New Banks in Town: Chinese Finance in Latin America*, Inter American Dialogue Report, February 2012, http://www.bu.edu/pardee/files/2013/07/The-New-Banks-in-Town_English.pdf

²⁸ Kevin P. Gallagher, Amos Irwin, and Katherine Koleski, *The New Banks in Town: Chinese Finance in Latin America*, op. cit.; Julie Jiang, Chen Ding op. cit

²⁹ Michael Forsythe, Henry Sanderson, *China's Superbank*, Singapore: Bloomberg Press, 2013, Erica Downs, Inside China, Inc, op. cit



through government-to-government talks. Moscow and Rosneft approached the State Council and CNPC, which then turned to CDB to finance the deal. Ultimately, the oil-backed loans were the first truly effective mechanism for earmarking set volumes of oil to China. Agreements with Brazil, Ecuador, and Venezuela amounted to 0.9-1.0 mb/d of supplies in 2012, out of 5.37 mb/d of imports that same year³⁰.

Russia

As a result, assessing the volumes of oil attached to these loans is a challenging task. What is more, oil-backed loans were not new, so some countries were already repaying small volumes for prior funding. China's first oil-backed loan to Russia dates back to 2005, but was a fraught process from the outset, likely informing future loan disbursements by China's policy banks. The loan was secured with a contract for Rosneft to deliver 0.18 mb/d of crude oil to CNPC from February 2005 through December 2010. The deal was concluded with great urgency, as Rosneft was trying to raise money to finance its \$9.4 billion purchase of the former Yukos oil subsidiary Yuganskneftegaz so Rosneft hastily agreed to the terms of the deal, and then, as oil prices rose, came to regret it³¹. The original contract price was the monthly weighted-average price of Brent, with a \$3 per barrel discount. But changes in the oil market in 2007 made it more profitable for Rosneft to sell oil to Europe than to CNPC. Rosneft therefore demanded a renegotiation of prices, leading to a lengthy dispute that ended in China agreeing to reduce the discount per barrel in March 2008.

The following year, however, the two sides negotiated a \$25 billion loan, entailing supplies of an additional 0.3 mb/d to China, in what has been the largest trade finance deal between the two sides, and the most significant contribution to China's energy security. Under the terms of the deal, Rosneft provides 0.18 mb/d and Transneft delivers another 0.12 mb/d of crude that it purchases from Rosneft, since Transneft does not produce oil. The price of the crude was determined, this time, based on the market quotes for Russia's ESPO blend crude at the Pacific port of Kozmino. CNPC deposits the money it owes Rosneft and Transneft for the oil into accounts at CDB opened on their behalf. CDB then has the right to directly debit cash funds from the account to secure repayment of principal, interest and other amounts payable under the loan agreement. In the event of a default, CDB has the right to debit the entire cash balance of the accounts³².

But the 2009 deal was more than just an export deal given that the agreement to begin construction of the ESPO pipeline and build a spur to China were also part of the loan deal. CDB's loans helped draw an end to 15 years of negotiations over the construction of the spur to China and also enabled the construction of the first phase of ESPO, from Taishet to Skovorodino. The loans CDB extended to Rosneft and Transneft were earmarked by the Chinese for the completion of the first phase of the pipeline and the spur to China, and Transneft was not allowed to access the loan until after it began construction of the spur.

Among all the oil-backed loans, this was by far the most substantial contribution to China's supply security, given that it offered China a land-based alternative to its maritime trade flows, led to the construction of ESPO and the subsequent transport of dedicated supplies from Russia to China. In 2013, CDB granted Rosneft an additional loan, bringing total volumes earmarked for China to almost 0.5 mb/d and potentially paving the way for Chinese upstream investments in Russia, a movement that Moscow has long resisted, but may be more inclined to offer Chinese companies as Russia's dependence on its neighbour, for both financing and political alliances, increases.

Despite the lack of upstream access—which the NOCs were keen to gain regardless of supply security—imports from Russia are at an all-time high, reaching 0.85 mb/d in 2015, according to

³⁰ Interfax Energy Weekly, 21 April 2010

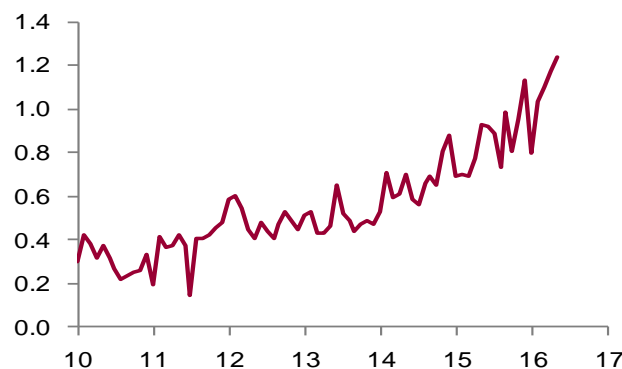
³¹ Erica Downs, Inside China, Inc., *op. cit*

³² James Henderson, Tatiana Mitrova, "Energy Relations between Russia and China: Playing Chess with the Dragon", OIES Paper, WPM 67, August 2016, available at <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/08/Energy-Relations-between-Russia-and-China-Playing-Chess-with-the-Dragon-WPM-67.pdf>; Julie Jiang, Chen Ding *op. cit*



Chinese Customs data (see Figure 8), challenging Saudi Arabia for its position as top supplier to China. In the first half of 2016, Russian exports to China reached 1.1 mb/d, compared to 0.79 mb/d in the first half of 2015. In addition, ESPO is a coveted crude grade for China's independent 'teapot' refiners, which appreciate its geographic proximity and the ability to deliver it in small parcels to Shandong ports that do not have VLCC berths, given that many independent refiners do not have the infrastructure in place to access these³³. Before the 'teapots' gained access to crude oil import quotas, refineries in Northern China (both along the Eastern provinces and in Xinjiang) were the main users of Russian grades³⁴.

Figure 8: Chinese crude oil imports from Russia, mb/d



Source: China Customs

Venezuela

CDB's loans to Venezuela, meanwhile, were signed with Venezuela's Bank for Economic and Social Development (BANDES). CDB offered BANDES lines of credit as early as 2007, including \$8 billion (in two disbursements) to capitalise the China-Venezuela Joint Investment Fund (JIF), which was created in order to finance infrastructure developments and social projects in Venezuela, and is administered by BANDES, as well as a separate loan facility valued at \$20.6 billion, all of which are secured by oil supply contracts³⁵.

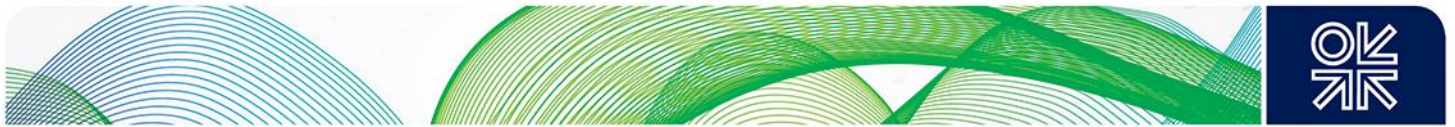
CDB's loans to BANDES for the JIF were secured by fuel oil sales from PDVSA to ChinaOil. The first \$4 billion disbursement required PDVSA to deliver 0.1 mb/d of fuel oil to Chinaoil but given the contract's inability to adapt to international crude costs, and rising opposition within Venezuela that the government was mortgaging the country's future oil output to China, the second \$4 billion tranche stipulated that the volumes delivered to Chinaoil would fluctuate with the price oil, from a minimum of 0.11 mb/d when oil prices are above \$60 per barrel to a maximum of 0.15 mb/d when oil prices are below \$42 per barrel. In total, for both tranches, PDVSA's fuel oil sales to Chinaoil were pegged at 0.20-0.25 mb/d and the revenue PDVSA earns from fuel oil sales to Chinaoil is used to finance BANDES' loans from CDB. Chinaoil deposits payments for the fuel oil into an account held by BANDES at CDB while PDVSA is allowed to deduct the volumes of fuel oil delivered to China from its production tax obligations.

Yet even with these new terms, CDB became concerned with its inability to monitor the expenditures for which its \$8 billion were used, fearing that discretionary spending under the Chavez regime would be criticised by subsequent governments, thereby paving the way for non-repayment of the loan. As a reflection of this, the \$20.6 billion loan signed in 2010 was structured differently. It included a dual

³³ Michal Meidan, *In Focus – Cracking China's Teapots*, February 2016, Energy Aspects

³⁴ Argus China Petroleum

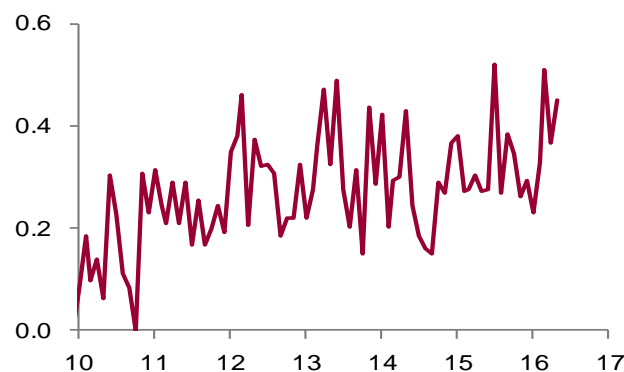
³⁵ Kevin P. Gallagher, Amos Irwin, and Katherine Koleski, *The New Banks in Town: Chinese Finance in Latin America*, op. cit.



credit facility of \$10 billion loan to BANDES, and a RMB 70 billion (\$10.6 billion) loan to BANDES, secured by revenue earned from an oil supply contract between PDVSA and Chinaoil, PDVSA agreed to deliver no less than 0.2 mb/d in 2010; no less than 0.25 mb/d in 2011; and no less than 0.3 mb/d in 2012 and until the obligations under the financing agreement have been fulfilled. Chinaoil will deposit its payments for the crude oil to an account held by BANDES at CDB, from which the interest, principal and other fees are deducted and PDVSA deducts these amounts from the taxes and royalties it transfers to the government. In the first years of loan repayment, as oil prices were above \$100 per barrel, the mechanism worked well for both sides: CDB was keeping \$70 per barrel to pay back the loans, and refunding as much as \$40 per barrel to Venezuela, allowing Caracas to counter the arguments that its oil revenues were beholden to China³⁶.

According to the terms of the loans, therefore, ChinaOil should have access to at least 0.5 mb/d of Venezuelan crude. In reality, the volumes shipped to China have been lower than these (see Figure 9), in large part because few refiners in China are capable of processing heavy Venezuelan grades³⁷. The biggest buyers have been the 'teapot' refiners, to which ChinaOil has been marketing barrels of Merey as a replacement for fuel oil.

Figure 9: Chinese crude oil imports from Venezuela, mb/d



Source: China Customs

The fall in global oil prices has severely impacted Venezuela's political stability, financial health and oil production³⁸. PDVSA has to make bond principal and interest payments totalling about \$4 billion in 2016, and an additional \$7.2 billion in 2017, according to the company's financial statement. In 2015, Beijing renewed tranche B of its previous loan and upped it to \$5 billion, adding a fresh \$5 billion loan to PDVSA to help boost its oil production. But the situation has continued to deteriorate and PDVSA has been seeking to renegotiate loan reimbursement with China. This will reportedly include a one-year grace on the loan, during which Venezuela would only pay interest on the loans and PDVSA would receive cash payments for shipments that currently go to pay principal. The interest-only payment terms would remain in place as long as Venezuelan crude is below \$50 per barrel and if crude prices continue to rise, China would apply a sliding scale under which Venezuela would steadily increase payment on the principal portion of the loans.

At the same time, Chinese officials are also in talks with the Venezuelan opposition, fearing that a change of government could entail an outright default on the loan to China—a political decision rather than economic calculus, given that Beijing remains Venezuela's main financial lifeline, and has been

³⁶ Interfax China Energy Weekly, 21 April 2010

³⁷ Argus China Petroleum, June 2014

³⁸ Matt Ferchen, "China and Venezuela: Equity oil and Political Risk", *China Brief*, volume 13, issue 3, Jamestown Foundation, <https://jamestown.org/program/china-and-venezuela-equity-oil-and-political-risk/>



open to alleviating the terms of repayment³⁹. So even though Venezuela's political developments and finances are a growing cause for concern, Beijing will seek to alleviate Venezuela's fiscal constraints, but is unlikely to offer another round of fresh lending as the NOCs remain tepid about additional upstream investments. It will sit tight and hope that repayment volumes will increase, but given the nature of the bank, it can afford to play the long game, especially since Venezuelan crude is not a key feedstock for China's refineries.

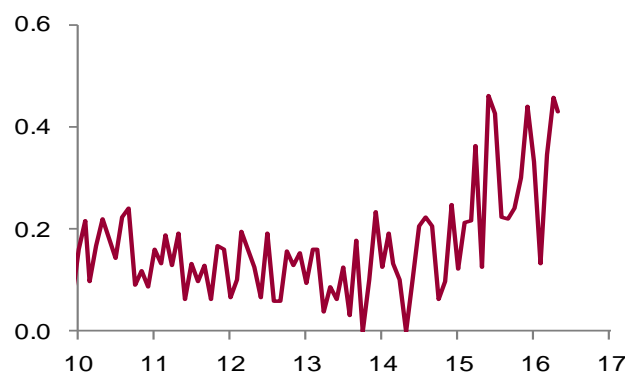
Brazil

Other loan recipients in Latin America are also turning once again to the China Development Bank as their finances are becoming increasingly squeezed. In April 2016, CDB agreed a new \$10 billion oil loan with Brazil's Petrobras, and a \$2 billion loan to Ecuador, likely against oil repayments to PetroChina⁴⁰.

CDB's loans to Brazil have also been repaid with revenues from oil sold to Unipet. The first \$10 billion loan to Petrobras, awarded in 2009, was signed for a 10-year term and linked to a crude delivery contract to supply Unipet with 0.15-0.20 mb/d of oil, and to a MoU between Sinopec and Petrobras to deepen cooperation. PetroChina deposits 79% of the oil revenue into Petrobras' CDB account, and diverts the remaining 21% to pay back the loan. In Brazil, Sinopec pays market prices for Petrobras' oil and deposits its payment in Petrobras' CDB account but Brazil must maintain a minimum account balance equivalent to six months of interest on the loan⁴¹.

Initially, Chinese requirements of local content inhibited upstream investments, but over time, Sinopec acquired a 30% stake in the Brazilian unit of Portugal's Galp, and a 40% share of the Brazilian arm of Repsol. Sinochem also purchased 10% stake in five offshore oil blocks in the Espirito Santos basin, followed by a 40% stake in Statoil's Peregrino field. Finally, the biggest win for China's NOCs was a production sharing contract in a consortium to develop a pre-salt discovery in the Libra oil field, though the participating NOCs are CNPC and CNOOC, rather than Sinopec. Yet, despite their equity stakes and loan repayment, imports of Brazilian crude to China averaged 0.14 mb/d between 2010 and 2014⁴².

Fig 10: Chinese crude imports from Brazil, mb/d



Source: China Customs

³⁹ Chen Qin, "China Seeks Assurances Against Possible Debt Default by Venezuela", *Caixin*, 21 June 2016, <http://english.caixin.com/2016-06-21/100957083.html>; Kejal Vyas, "China Rethinks Its Alliance With Reeling Venezuela", *Wall Street Journal*, 21 September 2016

⁴⁰ "China-Latin America: Beijing Still Lending, But for How Long?", *Energy Compass*, 13 May 2016; Corina Pons, Alexandra Ulmer, Marianna Parraga "EXCLUSIVE-Venezuela in talks with China for grace period in oil-for-loans deal –sources", *Reuters*, 15 June 2016

⁴¹ Kevin P. Gallagher, Amos Irwin, and Katherine Koleski, *The New Banks in Town: Chinese Finance in Latin America*, op. cit.

⁴² "Latin America: New Approach, Old Risks for China", *Energy Compass*, 7 November 2014



The impact of lower oil prices ushered in additional uncertainty as Brazil's finances were crimped, and Petrobras, which has also been mired in corruption and scandal, came knocking once again on China's door for loans. CDB has since offered an additional \$16 billion to Petrobras of which the latest, \$10 billion loan, was signed in 2016⁴³. And in 2015, Chinese imports of Brazilian oil surged to 0.28 mb/d according to Chinese customs data. In the first half of 2016, imports from Brazil reached 0.34 mb/d, higher y/y by 0.13 mb/d. This is due to a number of reasons. First, output from these fields has increased. According to the Brazilian National Agency of Petroleum, Natural Gas and Biofuels, Chinese-invested production went from 54 thousand b/d in 2012 to 0.11 mb/d in 2015. Second, Brazil has upped deliveries to China to compensate for lower oil prices and keep repayments on track and finally, due to the growing appetite for Brazilian grades from some 'teapots'.

Ecuador

The other large recipient of Chinese loans has been Ecuador. The country first received a \$1 billion CDB loan in 2010, secured against oil deliveries of 36 thousand b/d of Oriente or Napo crudes, or fuel oil, from Petroecuador to PetroChina, for four years. Petroecuador's selling price to China is calculated based on WTI. Another component of the financial package was the loan's interest rate, which CDB set at 7.25% for the first loan—but after Ecuador defaulted on \$3.2 billion in government bonds in 2008 and 2009, the rates went to 6% for the second, and 6.9% for the third, but they were still lower than the rates charged by sovereign debt lenders, estimated at 8.45%. Petroecuador was also required to maintain a minimum balance, equivalent to 130% of the principal and interest, to be paid in any given interest period⁴⁴.

But China's loans to Ecuador have come with few upstream investments, and extremely variable volumes of exports. Chinese companies own producing assets, including Sinochem's 14% interest in block 16, which it acquired from ConocoPhillips in 2003, as well as Encana's oil and pipeline interest, that CNPC and Sinopec acquired in 2006⁴⁵. But since China granted loans to Ecuador in 2016, CNPC was awarded rights to develop blocks in the Amazon-Yasuni ITT field, a controversial project that may prove challenging to develop⁴⁶.

And Ecuadorian crude exports have had little appeal in China. Between 2009 and 2014, imports from Ecuador averaged 18 thousand b/d, according to Chinese customs, even though loan repayments should amount to almost 0.1 mb/d. In 2015, import volumes increased to 28 thousand b/d, and in the first half of 2016, they totalled 22 thousand b/d, suggesting that loan repayments are being sold on by China's traders locally, as few refiners in China process these grades. Beijing's appetite for further lending to Ecuador will therefore depend on the upstream concessions the NOCs can gain, but even additional lending is unlikely to materially alter trade flows to China.

5. Conclusion

State financing has opened many doors for China's NOCs, although their experiences in the different countries have varied widely. The lengthy arm of the state only goes so far, however, and after the crude is produced or sold to state-owned traders, it is mostly the NOC's trading arms, not the government, who determine whether to trade it or sell it back to China. To be sure, the NOCs recognise that bringing back overseas crude production plays well with the government, but they will try to do so when the economics align as well. Moreover, Beijing has been increasingly empowering the NOCs trading arms to become more efficient and better use market dynamics to their financial advantage and mandating that all crude produced overseas would run counter to these efforts.

⁴³ Sabrina Valle, Denyse Godoy, "Petrobras Gets \$10 Billion Chinese Loan in Oil Supply Deal", *Bloomberg*, 26 February 2016

⁴⁴ "Ecuador economy: Debt rises as new Chinese loan agreed", *Economist Intelligence Unit*, 3 August 2011; Kevin P. Gallagher, Amos Irwin, and Katherine Koleski, *The New Banks in Town: Chinese Finance in Latin America*, op. cit.;

⁴⁵ Julie Jiang, Chen Ding, op. cit.

⁴⁶ Jonathan Kaiman, "Controversial Ecuador oil deal lets China stake an \$80-million claim to pristine Amazon rainforest", *LA Times*, 29 January 2016



Consequently, actual flows to China depend first and foremost on the fit with domestic refiners' needs, and then on pricing. This leaves the country still heavily dependent on Middle Eastern and Angolan grades, which in 2015 accounted for over 4 mb/d of China's 6.7 mb/d of imports. This is unlikely to change, especially as Iraqi and Iranian crudes will continue to vie for market share, and Saudi Arabia and Kuwait will not sit still as spectators if their market share is being eroded. Latin America's financial woes will likely lead the region to increase its supplies to China, with Brazilian crudes likely poised to make the biggest gains on rising domestic production and loan repayment. Russia, arguably the biggest winner of market share in China, is set to top the list of suppliers to China due to the need to repay loans, and amidst rising demand for its crude among the independent refiners. While China has started importing crude from several new locations, including the North Sea, and from various other African countries such as Cameroon and Ghana, ultimately these remain a tiny fraction of imports. Overall, despite Beijing's efforts at diversification and the billions of dollars in investments, China remains heavily exposed to a few key countries, namely Russia, Saudi Arabia, Iran, Iraq, Angola, Venezuela, and now, increasingly, to tempestuous Latin American countries.