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Two Decades of Brazil-China  
Oil Cooperation:  
Investments and  
Infrastructure Projects.

*Pedro Henrique Batista Barbosa*

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# Two Decades of Brazil-China Oil Cooperation: Investments and Infrastructure Projects.

Pedro Henrique Batista Barbosa<sup>1</sup>

## Resumen

Una de las facetas más importantes y dinámicas de las actuales relaciones económicas Brasil-China es la cooperación petrolera. Durante dos décadas, ambos países han pasado de un comercio casi inexistente a una relación creciente y diversificada que se expande en cuatro direcciones: comercio, inversiones, proyectos de infraestructura y préstamos. En la perspectiva china, además de ser un importante proveedor de petróleo crudo, Brasil es un destino importante para inversiones y servicios técnicos, operativos, de construcción y financieros. Todas las principales compañías petroleras chinas están presentes en el país, donde han invertido mucho. Una de las principales razones es el descubrimiento de una nueva riqueza: el óleo de la capa de presal. Brasil necesitaría nuevos actores para ayudarlo a explorarla, y China buscaba internacionalizar sus empresas. Este artículo busca comprender cuán profunda es la penetración china en el sector petrolero brasileño en términos de IED y servicios y cómo ha evolucionado este proceso a lo largo del tiempo.

## Palabras clave

Brasil. China. Petróleo. Inversiones. Proyectos de infraestructura.

石油合作是当前巴中经济关系最活跃的方面之一。在过去的二十年中，这两个国家已经从几乎不存在的石油交易状态发展到蓬勃和多元化的伙伴关系。这种伙伴关系扩展到四个方向：贸易，投资，基础设施项目和贷款。从中国的角度来看，巴西不仅是重要原油供应国，也是投资和技术、运营，建筑和金融服务的重要目的地。中国主要的石油公司都在该国进行了大量投资。主要原因之一是该国新的发现：盐下油田。巴西需要新的参与者来帮助探索它，而中国渴望使自己石油公司“走出去”。本文旨在了解中国公司在巴西石油直接投资和服务方面扮演什么角色，以及这一现象如何随着时间演变。

## 关键词

巴西。中国。石油。投资。基础设施项目。

## Abstract

One of the most important and dynamic facets of current Brazil-China economic relations is oil cooperation. Over two decades, both countries have evolved from almost non-existent oil exchanges to a booming and diversified partnership that spreads into four directions: trade, investments, infrastructure projects and loans. From China's perspective, besides being a big crude supplier, Brazil is a relevant destination of investments and technical, operational, construction and financial services. All major Chinese oil companies are present in the country, where they have been investing heavily. One of the main reasons is the discovery of a new richness: pre-salt oil. After this, Brazil needed new players to help explore it, and China was eager to make its oil firms "go global". This paper aims to understand how deep China has penetrated in Brazil's oil sector in terms of FDI and services and how this process has evolved over time.

## Key words

Brazil. China. Oil. Investments. Infrastructure projects.

<sup>1</sup> PhD candidate in international politics at Renmin University of China. Brazilian career diplomat. Opinions are personal. Acknowledgements:

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The author bears the sole responsibility for any incoherencies in this text. Likewise, the opinions expressed in this article do not necessarily reflect those of the institutions to which the author is affiliated.

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## Introduction

An analysis over Sino-Brazilian economic relations over the last two decades indicates that a new product became one of the most traded between them, one which has also attracted to Brazil more Chinese investments, infrastructure projects, and loans: crude oil. In each of these four pillars, there was a remarkable expansion from 2000 to 2019.

China's crude imports from Brazil consistently increased year by year, with slightly negative oscillations over time: from 1.7 million barrels per year (mby) in 2000 to 295 mby in 2019. This represents a growth 176 times bigger, the most considerable among Chinese suppliers. Brazil was one of China's top five oil partners in 2019, responsible for 8% of global oil imports (ITC 2020).

Much of this thriving trade is due to a concomitant explosion of Chinese global oil imports and of Brazilian crude exports. On the one hand, China's demand expanded 195% in the period, but its production lagged behind. To bridge this gap, the country has resorted to global markets. In 2019, China represented 22% of the global petroleum imports in value terms (while 3.9% in 2000), and foreign supplies accounted for 72% of total oil consumption (30% in 2000). On the other hand, Brazilian production grew 134%, from 1.2 to 2.9 million barrels a day (mbd), thanks to pre-salt oil. With more oil available, Brazilian world exports have expanded 65 times, from 0.02 mbd to the record of 1.2 mbd, an annual average increase of 42%. Most of this oil went to China, which accounted for 63% of national crude exports (ITC 2020).

Alongside with trade relations, China's biggest four oil companies (henceforth COC) –namely Sinopec, CNPC<sup>2</sup>, Sinochem and CNOOC– have directed increasing sums of foreign direct investments (FDI) towards Brazil. Either in the form of new projects –greenfield– or merger and acquisitions (M&A) –brownfield–, COC have enlarged their footprint in Brazil's oil sector, mostly upstream. In 2019, they were already the third largest producers, with 32.2 million barrels extracted, or 3.2% of national figures (ANP 2020).

Brazil's thriving oil sector has also interested Chinese constructors, machinery builders, engineering, procurement and construction (EPC) contractors, and all kinds of service providers. Important pipelines were built by COC. Chinese shipyards were the main benefactors of Petrobras' FPSO construction plans, the most sought-after in the world.

Supporting all said activities, China's policy banks, namely China Development Bank (CDB) and China's Export-Import Bank (CHEXIM), have disbursed loans in Brazil that are not negligible. Petrobras is their main partner. In some credit lines, loan-for-oil mechanisms were applied, as well as Chinese content requirements. Other Chinese financial institutions, such as Bank of China, ICBC, Sinosure, CIC and the Shanghai-based multilateral New Development Bank equally started to fund local oil firms.

Reasons for this exponential growth of relations in all four pillars are multifaced and reflect an economic complementarity between both countries. In other words, Brazil has the fossil fuels that China lacks and needs, while the latter country possesses financial means and experienced operators to help explore this oil. Therefore, the South-American giant became a natural destination of COC's investments.

This article is one in a series of three and focuses on analyzing two pillars of Sino-Brazilian oil cooperation: FDI and infrastructure projects. As a contribution to ongoing literature on these topics, this paper's main purpose is to draw an accurate picture of the extent of China's penetration in Brazil's oil sector between 2000 and 2019.

Through this process, the aim is to reveal the main actors involved and their numbers, in relation to investments, service projects, production etc. Another goal is to understand what are the drivers of the relationship and establish two categories for them: national (related to Brazil's oil sector conditions), and international (associated with global circumstances). Of no less importance is to contextualize the bilateral partnership in China's global oil expansion and observe Brazil's role in this process, and vice-versa.

## Chinese OFDI in Brazil

Over the last two decades, pushed by China's accession in the global economy, Chinese outbound FDI (COFDI) and infrastructure projects in Brazil have been increasing progressively, especially after 2010. Alongside this growth, there was an upsurge in Chinese investment-related academic articles and business reports.

Brazil-China Business Council (CEBC, initials in Portuguese) and the Brazilian Ministry of Economy (ME) have created databases to track and analyze Chinese investments in Brazil. According to the former, the stock of COFDI in Brazil between 2007 and 2018 is US\$ 102.5 billion. Considering only confirmed deals, it is US\$ 58 billion, distributed in 145 projects. The peak of COFDI happened in 2010 and numbers were high in 2011, 2015, 2016 and 2017. In the evolution of these investments, CEBC distinguishes four phases. The first one ended in 2010; Chinese firms were focused on commodities, mainly oil, minerals and soy. From 2010 to 2013, industrial assets and the big Brazilian consumer market were the targets. Later, services started to attract increasing investments, mainly in the financial sector, with Chinese banks disembarking in Brazil. Lastly, from 2014 on, infrastructure became increasingly important, and electricity and oil and gas (O&G) sectors have received special attention from Chinese investors (CEBC 2019).

The Brazilian Ministry of Economy has reached similar conclusions. Between 2003 and September 2019, there were no less than 175 confirmed Chinese investments, which involved roughly US\$ 80.6 billion. The peak was in 2010, with numbers fluctuating over time and reaching high levels again in 2015 and 2017. Electricity and oil extraction and production (E&P)

2 PetroChina's operations in Brazil are considered as part of CNPC, since the former is the latter subsidiary.

have received the majority of the funds. Electricity alone represented 45% of the total. Interestingly, the Ministry compares COFDI in Brazil with those of other countries. China was responsible for 89% of all BRICS members’ investments in Brazil in value terms. Considering the numbers of projects, this percentage is 65%. Comparing with USA, Japan, France, and Italy, the former country was the main investor in the period of analysis, responsible for 41% of all deals. It is followed by French (20%), Japanese (19%), Chinese (11%), and Italian (9%) investors (ME 2019).

Academic analyses on Chinese investments’ main characteristics, trends and impacts have also abounded in the last few years. For instance, Hiratuka highlights the increase of investments after 2010 and their change in sectors over time. Mining and oil extraction attracted most of the Chinese capital in 2010 (91%), but this percentage has decreased substantially over time, reaching 40% in 2016, when electricity accounted for 35%. Indeed, in the period 2014-2017, there was a sectoral diversification of COFDI, with more Chinese funds directed to manufacturing industry and some other service sectors, such as transportation and finance. Remarkably, most of COFDI was done by state-owned enterprises and the preferred mode of entry was M&A (Hiratuka 2019).

David Kupfer and Felipe de Freitas develop a new methodology for classifying COFDI in Brazil. Through access to different sources, they register 103 deals, which involved approximately US\$ 52 billion between 2010 and 2016. According to the authors, there were three tendencies: mounting investments in services, with O&G being replaced by electricity as the main target; increasing importance of greenfield deals, although M&A is still the main mode of entry; and diversification of sectors in 2012-2014, with reverse trends in the following years (Kupfer and Freitas 2018).

Pedro Veiga and Sandra Rios maintain that the importance of China as a source of foreign capital for Brazil is still moderate, despite the growth of COFDI in the South American country from 2010 onwards. They also raise the concern about an “excessive” dependence of China state companies in sectors perceived as strategic for the economy, such as energy, which has received the bulk of investments (Veiga and Rios 2019). Lastly, Lia Valls discusses the viability and possible positive and negative consequences of a Brazil-China investment treaty (Lia 2018).

Less abundant are analyses about specific Chinese infrastructure projects in Brazil, although, more recently, the quantity has grown. For example, Hiratuka discusses the importance of Chinese investments as a way to close the infrastructure gap in Brazil. He further analyses two cases: Belo Monte transmission lines, built by State Grid, and the twin ocean railroad (Hiratuka 2018).

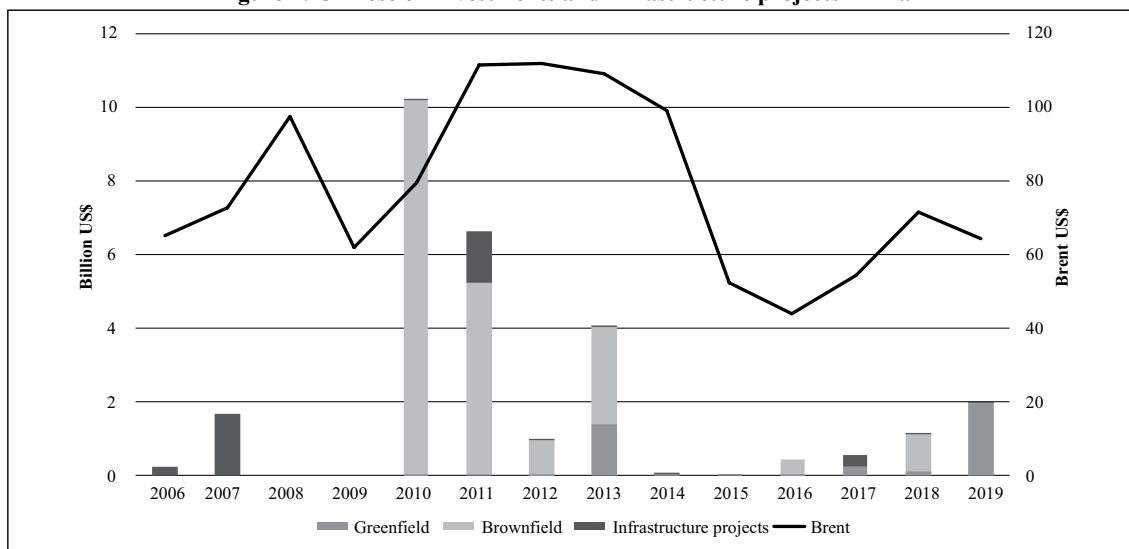
Adriano Proença and David Kupfer describe the activities of some Chinese firms in Brazil, such as Huawei, China Three Gorges and State Grid. They depict their main projects and explain their evolution over time (Proença and Kupfer 2018).

### Chinese OFDI in Brazil’s oil sector

As discussed above, O&G is one of the leading sectors of Brazilian economy in terms of COFDI. This research investigation has found approximately US\$ 27.9 billion in investments. COFDI –greenfield, brownfield and research and development (R&D)– have reached US\$ 24.1 billion; infrastructure projects have amounted to US\$ 3.8 billion.<sup>3</sup>

The first oil-related Chinese investment in Brazil occurred in 2010<sup>4</sup>. Between 2010 and 2019, Chinese investments in Brazil’s oil sector have reached US\$ 24.1 billion. In terms of mode of entry, greenfield projects (GFDI) were up to US\$ 3.7 billion; brownfield, US\$ 20.4 billion; and R&D, US\$ 89 million.

**Figure 1: Chinese oil investments and infrastructure projects in Brazil**



Source: Author’s calculation based on multiple sources.

<sup>3</sup> For the list of projects, see appendix.

<sup>4</sup> The first Chinese oil-related project in Brazil was in 2006, more than a decade after the country’s first overseas investment in oil production in Thailand, Canada and Peru in 1993 (IEA 2014: 6). It involved the construction of the first part of the Southeast-Northeast pipeline (Gasene, in Portuguese).

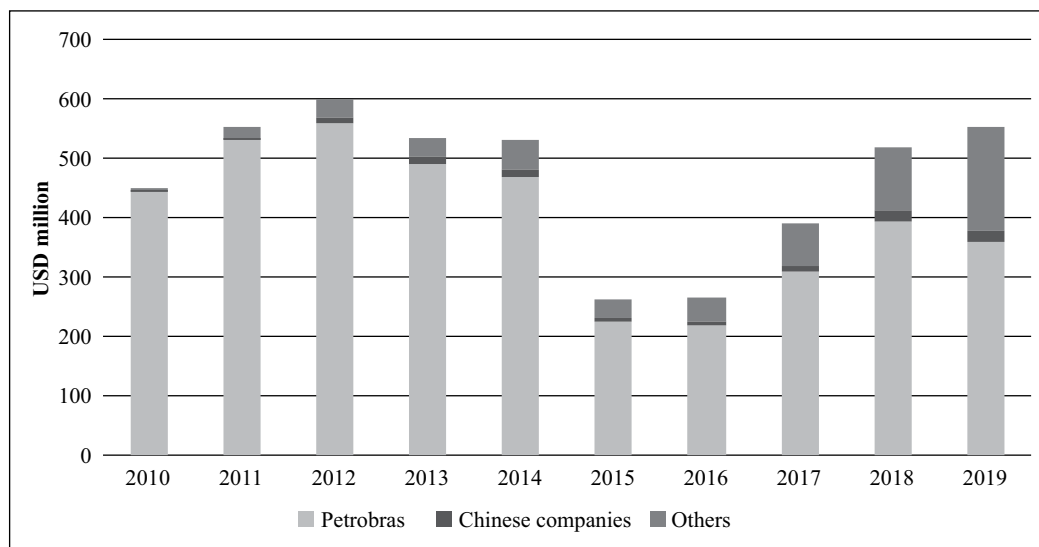
COFDI's values have varied considerably over time since their onset in 2010, the year in which investments reached their peak, with more than US\$ 10 billion spent in acquisition of local concessionaires. Other brownfield projects happened in 2011, 2012, 2016 and 2018, involving US\$ 5.2 billion, US\$ 1 billion, US\$ 441 million and US\$ 993 million respectively. There were no M&A in other years.

GFDI started in 2011 with insignificant values<sup>5</sup>. In 2013, they topped US\$ 1.4 billion, but dropped the following years –US\$ 2 million in 2015, US\$ 242 million in 2017 and US\$ 100 million in 2018– until they peaked again in 2019 with US\$ 1.9 billion.

Interestingly, as a whole, Chinese oil FDI have followed the fluctuation of oil rates over the years. Investments have flowed in greater quantities to Brazil in periods when oil prices reached historical heights, such as from 2009/2010 on. With the drop of Brent prices from 2014 on, Chinese oil firms have refrained their disbursements as well, only to regain impetus after 2016, when prices have shown an upward tendency.

This pattern was also seen in China's global investments. When oil prices were going up, they sped up their movements inside China and abroad; when rates went down from 2014 on, they became more conservative. For instance, COC's global investments dropped 80% in 2014 in a year-on-year basis (IEA 2017: 60). Similarly, they have shut down fields, slowed down drilling activities and kept on hold some projects in China, which only restarted from 2017 on, when oil prices initiated an ascending trend (IEA 2017: 10).<sup>6</sup>

**Figure 2: Concessionaires' R&D investments (2010-2019)**



Source: Author's calculation based on data from ANP.

R&D investments have increased progressively over time, following COC's increasing production in Brazil. According to Brazilian law and ANP's regulations, each concessionaire is obliged to reinvest part of its revenue in R&D<sup>7</sup>. Therefore, along with the growth of COC's FDI in the country, R&D expenditures have grown *pari passu*. From around US\$ 1 million in 2010, quantities augmented to US\$ 17 million in 2019.

Separating investments by oil sector<sup>8</sup>, upstream was the preferred segment, amassing up to US\$ 22.6 billion, the great majority of which went to brownfield projects, totaling US\$ 18.9 billion –GFDI were of US\$ 3.7 billion. It is followed by downstream and middlestream, with US\$ 993 million and US\$ 441 million –all M&As– respectively.

Separating FDI numbers by the big four Chinese oil companies<sup>9</sup>, Sinopec and its affiliated corporations have totaled US\$ 13.4 billion –roughly 56% of the whole. In second place, CNPC's subsidiaries –CNODC, PetroChina, Bomcobras– spent US\$ 5.5 billion (23%), then Sinochem and CNOOC with US\$ 3 billion and US\$ 1.6 billion respectively (13% and 7%). For R&D projects, Sinopec is historically the biggest investor as well, responsible for around two-thirds of Chinese annual disbursements. It is followed by Sinochem, which usually accounts for 20%, and then CNOOC and CNODC with minor ratios. It is worth mentioning that, in comparison with the total US\$ 555 million spent by all concessionaires in Brazil in 2019, Chinese R&D figures are still small.

Considering these numbers above, two characteristics of Chinese oil investments become clear. Firstly, there is a high level of concentration of projects in the hands of a few companies, which were responsible for the absolute majority of

<sup>5</sup> R&D numbers are not included here.

<sup>6</sup> Interestingly, some partially attribute this slowdown to a national anti-corruption campaign in China that has put some of COC's activities around the world in scrutiny (Vasquez 2019: 6).

<sup>7</sup> According to Law n. 9478/1997, article 1, XVII, ANP must foster R&D oil investments. In each oil exploration and production contract, there is a clause that defines the amount of money to be invested. In concession and production sharing regimes' contracts, it is 1% of the concessionaire revenue. In the case of onerous assignment regime contracts, it is 0.5% (ANP 2020).

<sup>8</sup> R&D numbers are not included here.

<sup>9</sup> R&D numbers are not included here.



amounts disbursed –approximately 99%. Moreover, these four firms are central state-owned enterprises (SOE), a common feature in all Chinese investments in Latin America (Peters 2020: 8), (Peters 2015).

It is important to take a step back and look at Chinese investments in Brazil inside the broader picture of Chinese oil companies’ overseas expansion, so as to observe Brazil’s within a global portrait. Resorting to FDI data from the China Global Investment Tracker, between 2010 and 2019<sup>10</sup>, there were around US\$ 132.2 billion disbursed by Chinese corporations all over the world in oil-related projects (AEI 2020). Comparing this amount with the US\$ 24.1 billion spent in Brazil, this would represent more than 18%, putting the South American giant in the position of being the main destination of China’s global oil investments over the period.<sup>11</sup> Brazil has also received more than three times the amount directed to other South American nations, in which China invested US\$ 7.7 billion.

## Chinese oil projects in Brazil

The inaugural Chinese oil investment in Brazil was in May 2010, when Sinochem spent more than US\$ 3 billion on buying 40% of the Peregrino field from Statoil (Estadao 2010). In that month, it also acquired the same percentage in two other blocks at Pitangola field, Campos basin –C-M-529 e C-M-530<sup>12</sup>–, but the numbers involved were not disclosed. In 2012, the company acquired from Perenco a 10% share in five exploration blocks at the Espirito Santo basin (Sinochem 2012). Three of them were sold afterwards.

There is, however, one announced FDI that never came to life. In 2013, the firm publicized the purchase of Petrobras’ stake (35%) in Block BC-10, also known as “Parque das Conchas”, for US\$ 1.5 billion in cash (Sinochem 2013). Yet, this transaction has no record in ANP’s files, a typical example of “zombie deal”.

**Table 1: % of COCs in Brazilian oil blocks/fields, except Sinopec**

Companies	Pre-salt						Pos-salt				
	PP1	PP3		PP5	PP6	CO	M&A		BID9	BID13	BID14
	Libra	Alto de Cabo Frio Oeste	Peroba	Pau Brasil	Aram	Buzios	BM-ES-37/39	Peregrino (BM-C-7)	C-M-529/530	REC-T-153	ES-M-592
CNODC	10%		20%		20%	5%					
CNOOC	10%	20%		30%		5%					100%*
Sinochem							10%	40%	40%		
HLJW										100%*	

Source: Author’s calculations based on ANP’s data. BID refers to post-salt auctions; PP, to production sharing regime pre-salt auctions; and CO, to onerous assignment regime pre-salt auctions. (\* operator)

As shown, CNOOC’s confirmed FDI have totalized US\$ 1.6 billion. Its first shot was joining the winning consortium of the Libra field in 2013, like CNPC did. Libra was then the largest pre-salt field. For a 10% participation, it has disbursed approximately US\$ 691 million in bonus, taxes and PEM.

Four years later, there were two more investments. The company took a pioneering step among the COC, buying by themselves the rights to explore the post-salt block ES-M-592, at the Espirito Santo basin, they would be its sole operator, another innovation amid the COC (ANP 2017). Until then, Chinese companies operating alone in Brazil –Petrogal and Repsol-Sinopec are not included– have obtained just up to 40% of the fields and with non-operational roles. Moreover, it entered in two pre-salt winning associations, both with minority stakes: Alto de Cabo Frio Oeste (ANP 2017) and Pau Brasil (ANP 2018) fields.

Nonetheless, CNOOC’s biggest investment in Brazil happened at the end of 2019. In an auction that involved several billion dollars and lack of interest from other international oil companies (IOC), it joined the winning consortium of the pre-salt Buzios field, regarded as the world’s biggest deep-water oil field (Petrobras 2020). For a 5% share, it has spent around US\$ 835 million.

CNPC is another COC that has invested huge sums. Estimates go up to US\$ 5.5 billion. Although it started to prospect opportunities in the country as early as 2005, when it signed a memorandum of understanding (MOU) with Petrobras to foster joint cooperation projects (Petroquímica 2005) it made its biggest bet in October 2013, which was participating in the Libra field auction, the first one of the pre-salt era (G1 2013). CNPC –operating always through its subsidiary CNODC– and CNOOC’s consortium with Petrobras, Total and Shell offered the best conditions, overshadowing other groups, in which Repsol-Sinopec and Petrogal took part. Their involvement is considered a landmark in Brazil-China oil cooperation, in that

<sup>10</sup> Only oil & gas investments in the database were considered here.

<sup>11</sup> In the database, Canada is the country that received most of Chinese global oil investments from 2010 to 2019, however Brazilian numbers are underestimated, because some projects in Brazil are not included and the database only considers projects over US\$ 100 million.

<sup>12</sup> Contract of concession n. BM-C-47.



for the first time COC engaged in a greenfield E&P project, participating in an auction process; before that, they all entered in Brazil through M&As. Besides, this was both companies' inaugural joint investment in the world, although they have already cooperated separately with Sinopec in other projects (Becard and Macedo 2014: 151) (Hogenboom 2017: 199).

Actually, CNPC disembarked in Brazil two years before Libra and not in the upstream sector. In 2011, its subsidiary Baoji Oilfield Machinery Company (Bomco) and the Brazilian firms Brasil China Petróleo (BRCP) and Asperbras established the joint-venture Bomcobras (Bomcobras 2020), each owning 34%, 33% and 33% respectively of the new enterprise. Its objective is to supply equipment for land and sea-based oil exploration, like mud pumps, drillings pipes and towers, cranes and probes (Husar and Best 2013: 16). This was in line with the COC strategy to expand activities to middle and downstream international assets (Zhang 2017). Bomcobras invested US\$ 73.6 millions to build a factory of probe oil tools at Bahia state (Macauhub 2011).

Also, in 2013, PetroChina, the biggest subsidiary of CNPC, took advantage of Petrobras' disinvestment plans and expended US\$ 2.6 billion to buy Petrobras' assets in Peru and, thus, became the Andean country's biggest oil producer (O Tempo 2014).

Four years later, CNPC joined hands with Petrobras again in another pre-salt area and got a 20% stake in the winning consortium of Peroba field (Petrobras 2017). In 2018, PetroChina concluded the partial acquisition (30%) of TT Work in 2018, formerly part of the Brazilian group Total (JC 2018), paying US\$ 992 million. Most of the company's activities are in the downstream sector.

In 2019, alongside with CNOOC, CNPC also got a 5% share at multibillionaire Buzios' field auction, in partnership with Petrobras (ANP 2019). Because of its importance and size, this investment can be regarded as another milestone of Chinese investments in Brazil's oil sector, especially considering their high productivity production.

One day after, another important step. Once again in association with Petrobras, CNPC acquired a 20% participation at the pre-salt Aram field, paying as much as US\$ 260 million in bonus, taxes and planned investments (ANP 2019). With these two deals, CNPC and CNOOC are poised to become one of the main oil producers in Brazil in the near future.

CNPC was equally involved in other investments that were announced, but not yet implemented. In 2016, Bomcobras announced investments in the Ceará state's Export Processing Zone of Pecém, in the same area that Guangdong Zhenrong Energy was planning to build a refinery (Falcao 2017). In 2017, CNPC and Petrobras established a comprehensive partnership and signed a MOU aiming at building a refinery at the Petroquimical Complex of Rio de Janeiro (Comperj) (Petrobras 2017). In 2018, this partnership was extended with another agreement, in which CNPC would buy a 20% participation of CNPC in oil fields at Marlim cluster (Petrobras 2018). Nevertheless, in December 2019, Petrobras declared that the economic feasibility study showed that the refinery project was not feasible and ended the partnership with CNPC (Petrobras 2019).

Sinopec was the first COC to arrive in Brazil and the one that devoted the largest sums, roughly US\$ 13.4 billion in FDI. As early as March 2004, it started negotiations with Petrobras and signed a cooperation agreement to develop projects together in different sectors (Ripardo 2004). Nonetheless, its first investment was only in October 2010, when it acquired 40% of the Spanish company Repsol's assets in Brazil for US\$ 7.1 billion and created the joint-venture Repsol-Sinopec (G1 2010)<sup>13</sup>. CNOOC was also active during the bidding process, but was not successful (Husar and Best 2013: 24). This was Sinopec's second biggest transaction outside China, after the acquisition of Addax Petroleum one year before (AEI 2020).

Repsol landed in Brazil in 1997 and, from 2010 on, with the new capital injection, started to focus on the upstream sector, especially in its oils fields at Santos Basin (Lapa and Sapinhoa) (Schutte and Debone 2017: 99) (Repsol-Sinopec 2019) (Vasquez 2018: 11). In 2019, it was the fourth biggest oil producer in Brazil (ANP 2020).

**Table 2: percentage of Sinopec companies in Brazilian oil blocks/fields**

Sinopec's companies	Pre-salt					Pos-salt													
	Norte Carcará	Uirapurú	Lula (BM-S-11) e Atapu (BM-S-11A)	Sapinhoá, Nordeste, Noroeste e Sudoeste	Lapa (BM-S-9 e 9A)	BM-S-7	BM-S-50/51 e S-M-619/623	Albacora Leste	BM-POT-51*	BM-PEPB-1, 2 e 3	BT-POT-29*/32/36*	POT-T-699	AM-T-84	BM-C-33 C-M-539	Carcará (BM-S-8)	BM-PAMA-8	BM-S-24 e C-M-791	BM-POT-16/17 e BM-ES-31	ES-M-414
Repsol-Sinopec				25%	25%	37%	20%	10%						35%					11%
Sinopec															20%				
Petrogal	20%	14%	10%						50%	20%	50%	50%	40%		20%		20%	20%	

Source: Author's calculation based on ANP's data. (\* operator)

13 Repsol has continued to act as an independent company in Brazil after the establishment of the joint venture.

In April 2011, Sinopec got also a 20% participation in the Northeastern exploration blocks BM-PAMA-3 and BM-PAMA-8 from Petrobras (Globo 2011), as part of the General Agreement of Technological Cooperation, signed by both companies during former president Dilma Rousseff visit to China (Schutte and Debone 2017: 100). However, it sold back the first one in 2016 (Bitencourt 2016).

In November 2011, Sinopec obtained 30% of the Portuguese firm Petrogal Brasil for US\$ 5.2 billion and gained access to important areas, such as pre-salt Lula field, where it got a 3% share (Mercopress 2012). It became the first COC to have access to pre-salt zone. Petrogal was Brazil's third biggest oil producer in the end of 2019.

After these two big deals, Sinopec have mainly operated through these companies' flagships and got involved in several greenfield projects, some of them in pre-salt fields, such as Norte de Carcara, Uirapuru and Sapinhoa.

Sinopec has equally announced plans to enter Brazil's downstream sector. In 2013, it signed a letter of intent with Petrobras to discuss the Premium Refinery I project, at Maranhão state (Globo 2011). After the Brazilian firm downsized its investment plans due to financial restrictions, Sinopec was reported to still be interested in advancing the idea in 2017 (Ordoñez 2017).

Outside the big four COC's investments, there are other firms operating in Brazil. The Chinese group HLJW is active through its local joint-venture Tek Oleo & Gas. It owns an onshore oil block in the Northeast (ANP 2020) and won two more in 2017 in the same region for themselves, but failed to fulfill the ANP's conditions and underwent a punitive administrative process (ANP 2017).

Another institution that took advantage of Petrobras' disinvestment plans is CIC Capital Corporation, a subsidiary of China Investment Corporation (CIC). It joined an international investment consortium that bought 90% of Petrobras' Nova Transportadora do Sudeste (NTS), which manages more than two thousand kilometers of gas pipelines in Brazil's Southeast region (Petrobras 2016).

### Chinese oil companies' production in Brazil

All these investments in Brazil's upstream sector has secured not only a big share in the Brazilian volume of recoverable oil reserves, but also an increasing participation of COC in national oil production. Between 2011 and 2019<sup>14</sup>, COC's "equity" production has scaled up their part in the total, from 5.5 mby to 32.2 mby –0.7% to 3.2% respectively–, a growth of 486% and an aggregate number of 185.3 million of barrels in nine years. In comparison, other oil companies in Brazil saw their numbers expanding 29% in the period.

**Table 3: COC's oil production in Brazil (2011-2019; mby)**

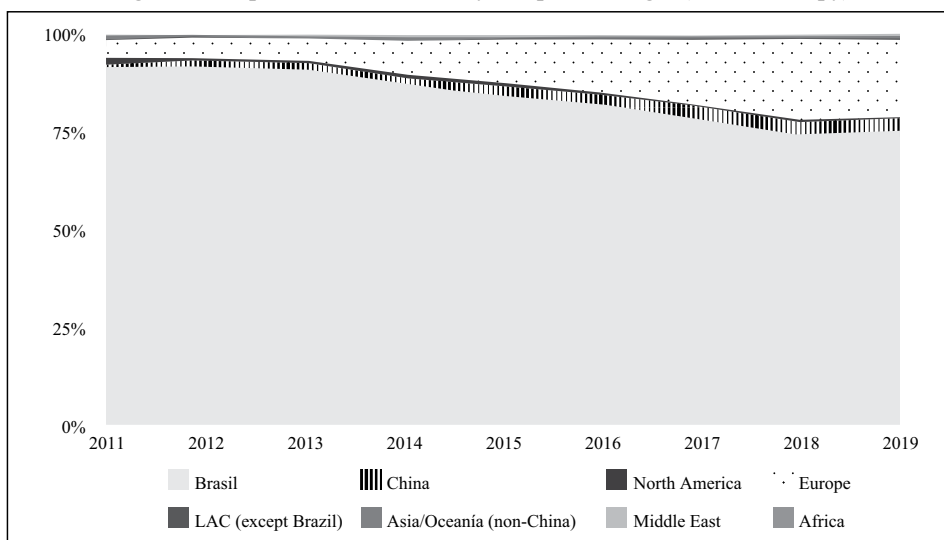
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Sinopec	1.67	1.92	3.0	6.0	11.1	15.0	19.4	20.5	20.6
Sinochem	3.8	9.0	10.1	10.9	10.6	9.2	9.8	9.0	8.9
CNODC	0.0	0.0	0.0	0.0	0.0	0.0	0.039	0.9	1.3
CNOOC	0.0	0.0	0.0	0.0	0.0	0.0	0.039	0.9	1.3
Other companies	763.0	743.5	725.2	806.1	868.0	894.6	926.8	912.8	985.4

Source: Author's calculation based on data from ANP.

Sinopec's production has expanded the most; twelve-fold, from 1.67 mby to 20.6 mby –or 0.2% to 2% of the total. It has already extracted 99 million of barrels. This fast advance in a relatively short period of time is a result of the company's aggressive expansion in the country during the last few years, as discussed above. Petrogal and Repsol Sinopec were the 13<sup>th</sup> and the 10<sup>th</sup> biggest producers respectively in 2011, ending 2019 in third and fourth places.

Sinochem is the second biggest Chinese producer in Brazil. Its production accumulated 81.6 million of barrels and has varied from 3.8 mby to 8.9 mby, expanding 134% in the period. This rhythm also reflects the pace of its investments, which were more concentrated in the early years of its arrival in the country. Its position in the national ranking fluctuated over time and was seventh in 2019.

**Figure 3: Oil production in Brazil by companies' origin (2011-2019, bpy)**



Source: Author's calculation based on data from ANP.

Lastly, CNOOC and CNODC are latecomers compared to its sister companies, because they only started producing in 2017, when the pre-salt Libra field entered into production. Their numbers are still small, 4.6 million of barrels altogether –or 0.2% of the national figures in 2019. However, their production grew 33 times in three years and is expected to augment more in the near future. Although both firms are still the 18<sup>th</sup>/19<sup>th</sup> largest producers, they might rise fast in the next few years, because their pre-salt investments will reach production phase soon. Sub-salt fields have higher productivity than pos-salt ones.

Although COC's production still represents a small percentage of the total, the fact that they are newcomers and that they expanded in a relatively short span of time has attracted attention from analysts from private and public sectors. Yet, it is relevant to put this phenomenon in a broader picture, comparing their performance with other national oil companies (NOC) and IOC operating in Brazil.

Dividing the concessionaires per region of the globe, some interesting aspects come out. NOC have their share of national production consistently decreasing over the years, from 92% to 75%, whereas IOC's percentage grew, as a consequence of their increasing investments in Brazil. European firms have increased their share of the country's production the most, from 32 mby to 202 mby –or 4% to 20% of the total, an expansion of 527% in the whole period. As said above, COC enlarged their portion in a relatively slower pace, 486%. Other regions have kept their shares stable over time and have rarely surpassed 1%, although their numbers have grown in absolute terms. Figures from corporations from North America and Asia-Oceania –non-Chinese– have decreased.

Interestingly, taken as a group, Chinese production is the third largest, after Petrobras and Shell. The Brazilian oil giant is still the main producer and operator, although with decreasing participation in national numbers. Among IOC, Shell has invested heavily in extraction and saw its production grow almost ten times in nine years. Even disregarding the “Chinese” part in Petrogal and Repson-Sinopec, both continued to be the third and fourth largest producers in Brazil.

## Chinese oil-related infrastructure projects in Brazil

This research investigation has found as much as US\$ 3.8 billion in infrastructure projects offered by Chinese firms in Brazil<sup>15</sup>. The first venture started in 2006, and numbers have varied substantially over time, with two peaks in 2006/07 and 2011, when they surpassed US\$ 1 billion.

The inaugural project was the Gasene pipeline. In September 2004, Sinopec and Petrobras signed a MOU to construct the Southeast-Northeast Interconnection Gas Pipeline (Wertheim 2004). In 2005, the Chinese corporation formally established a Brazilian branch (Monitor Mercantil 2019). In 2006, both companies signed an EPC contract to build the first of three sections, known as Gascav, from Cabiúnas (Rio de Janeiro state) to Vitoria (Espírito Santo state, or ES), with 300 km of extension. The total cost was US\$ 239 million (Petrobras 2006). In December 2007, the Chinese firm assumed the construction of the third section, Gascac, between Cacimbas (ES) and Catu (Bahia state), with 946 km and an estimated price of US\$ 1.6 billion (Petrobras 2007). The pipeline was inaugurated in 2010, with the presidents of both nations present on the occasion (OE 2011).

<sup>15</sup> The definition of infrastructure project used here comes from the Monitor of Chinese Infrastructure in Latin America and Caribbean 2020: “a service between a customer and a supplier through a contract –usually the result of a bidding process, although the process may be by direct designation– and in which the ownership belongs to the customer” (Peters 2020: 2).

**Table 4: COFDI and infrastructure projects in Brazil 2006-2019 (US\$ million)**

COCs	Peregrino (40%)	TT Work	Aram (20%)	Buzios (5%)	Pau Brasil	Alto de Cabo Frio Oeste	Libra (10%)	Peroba (20%)	Bomcabras	UFN3	Repsol (40%)	Petrogal (30%)	Samarco	Gasene	TRBA	Uirapuru	Norte Carcará	Entorno de Sapinhoá	Several projects	TOTAL
Sinopec										995	7111	5190	400	1900	49	31	58	6	1098	16838
CNPC		993	260	835			692	133	25											2938
CNOOC				835	56	31	692												13	1626
Sinochem	3070																			3070
HLJW																			3	3
CIC																			441	441
JASAC																			124	124
Sh. Kerui																			301	301
BDG																			33	33

Source: Author's calculation based on multiple sources.

The Gasene deal has guaranteed a good foundation for Sinopec in Brazil –and CDB as well, since it financed part of the project (Alves 2013: 116)<sup>16</sup>– although it had to abide by local norms that required a minimum of 75% of goods and services acquired inside the country (Xu 2017: 54). Still, it helped establish a partnership with Petrobras that latter expanded to the upstream sector, where the Chinese firm's main interest resided, especially after the discovery of pre-salt reservoirs.

After the Gasene project, Sinopec has established itself as a service provider to Petrobras and other Brazilian companies. A few examples are contracts for construction of a mineral pipeline for Samarco in 2011 (US\$ 400 million), the Petrobras' terminal of regasification in Bahia state (TRBA) in 2012 (US\$ 48.8 million) (A&M 2018) and the Fertilizer Unit III (UFN3) in Tres Lagoas (MS) in 2013 (US\$ 1.2 billion). The last two ended in judicial litigation (Globo 2014) (Polito 2018). In total, Sinopec's contracts with local corporations amounted to US\$ 3.4 billion.

Sinopec was not alone as a provider of services to local oil companies. Other Chinese firms, such as BDG Brasil, Jiangsu Asian Star Anchor Chain (JASAC) and Shandong Kerui were all active. JASAC has obtained eight contracts with Petrobras from 2014 on, most of them related to anchoring services (Petrobras 2020). They totaled US\$ 124 million. Shandong Kerui has established a joint venture with the local Potencial Engenharia (51% and 49% respectively) and submitted the best proposal to finish the construction of Petrobras' natural gas processing unit (UPGN) at Comperj, in a contract worth US\$ 590 million (Valor 2017). Lastly, BDG has offered seismic data services in 2018 for roughly US\$ 33 million (Petrobras 2020).

In May 2019, China Union Offshore has announced its new premises in the city of Macae, so as to provide anchoring services. 500 jobs would possibly be created. However, this deal could not be found in Petrobras' system (ODEbate 2019).

## Raison d'être of Chinese oil investments and infrastructure projects in Brazil

Reasons for the exponential growth of Chinese oil companies' investments and infrastructure projects in Brazil –and fluctuations over time– are multifold. The announcement of new huge oil reserves in the pre-salt zone in late 2006 certainly has prompted China's "going out" policy to open a new chapter in the bilateral oil cooperation. From then on, with a promising expansion of oil production and exports in the coming decades, Brazil would offer what China wanted to access: (i) natural resources to import, (ii) strategic assets to explore, (iii) economic opportunities to its engineering and machinery companies to grasp and (iv) technologies to acquire and develop (Wu 2019: 25) (Rosito 2017: 14) (Liao 2015: 89) (Vasquez 2019: 5) (Schutte and Debone 2017: 96) (Leao and Puty 2018: 2) (IEA 2014: 40) (Gopal 2018: 3).

### Abundant natural resources

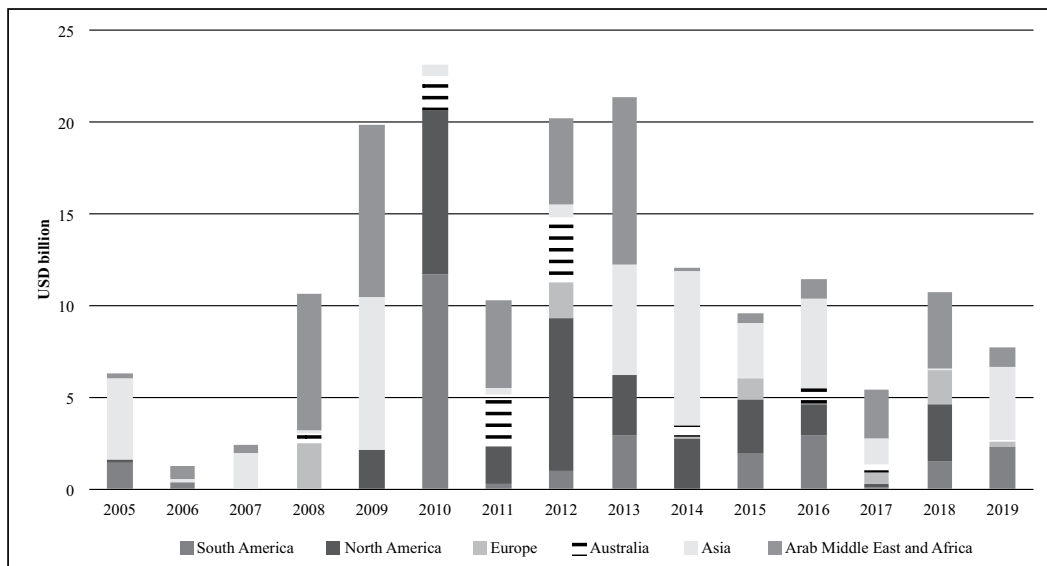
After the pre-salt area became one of the two new world frontiers of oil & gas production alongside with shale gas, Brazil became a very promising long-term oil source and a viable alternative in China's oil diplomacy (Xu 2017: 50) (Almeida and Consoli 2014: 1). The country has indeed started to attract world attention with its oil exploration potentialities. The International Energy Association (IEA) predicted in 2013 that, with the new discoveries, Brazil might become the fastest growing oil producer outside the Middle East in the future. Its oil production could reach 5.7 mb/d by 2035, making it the world's sixth largest oil producer (Husar and Best 2013: 14). At the same year, IEA forecasted that offshore oil production would correspond to 13% of the world's oil supply and one third of it would come from Brazil (Cui 2015: 47).

<sup>16</sup> The deal and related loan did not involve any oil supply contract in return, as it happened in the future contracts.

## Strategic assets to explore

COC saw in Brazil a promising opportunity to expand overseas oil & gas acreage (IEA 2014: 13) (Jia 2009: 40). When they started their international expansion in the middle 2000s, as part of the “Going Out” strategy, the best acreage in non-risky areas was already in the hands of Western companies. As “latecomers”, they were left with fewer choices, and several opportunities were in countries or projects considered politically, socially, economically or geologically riskier or demanding (Vasquez 2019: 16) (Hogenboom 2017: 179) (Wu 2019: 25). Setbacks and disruption of production were common in these areas. In contrast, Brazilian pre-salt oil exploration, although a challenge in financial and technological terms, was regulated under a stable and predictable legal system and open to international competition.

Figure 4: Chinese overseas FDI per region (US\$ billion)



Source: Author’s calculation based on data from American Enterprise Institute.

To increase investments in Brazil was also important to diversify oil investment destinations –apart from suppliers–, so as to move away from riskier parts of the globe that underwent political instability, ethnic tensions, security breaches and oil production disruptions (Vasquez 2019: 7). Some events in the Middle East, Africa and Central Asia made the business atmosphere more challenging: the Arab Spring, civil wars in Syria and Libya, Iraq’s volatile environment, conflicts between Sudan and the newly independent South Sudan, and in South Sudan itself, terrorist threats in Nigeria and U.S. and Europe’s sanctions on Iran’s oil and gas industry because of its nuclear program (IEA 2014: 27). There were kidnapping and murders of Chinese citizens in Nigeria, evacuation in South Sudan (IEA 2014: 31) and reversal of contracts in Niger and Chad (IEA 2014: 34). Exports from Sudan and South Sudan to China dropped to zero in 2012, when both countries were disputing oil resources (EIA 2015).

These events and disruptions in oil production and exports have made COC more cautious and eager to diversify its portfolio towards more politically stable investment climates. Brazil emerged as an ideal candidate as well as other countries members of the Organization for Economic Cooperation and Development (OECD) (IEA 2014: 7). Remarkably, from 2010 on, COC have started to allocate more resources to regions other than Middle East, Africa and Asia. South and North America became hot spots, followed by Europe and Australia (AEI 2020).

China’s global oil investments and those directed to Brazil have a similar pattern of growth over time. There is a peak in 2010, followed by an uneven decline in the following years. As mentioned above, this fluctuations reflect the evolution of oil prices over the period.

The 2008 global financial crisis outbreak has compelled several IOC to cut down costs and sell some assets. Pocket-full COC have taken advantage of this opportunity and bought oil & gas areas with reduced prices all over the world (Hogenboom 2017: 202). Up to 2015, more than 20 COC had invested in close to 200 projects, in 54 countries. China’s total overseas oil production jumped to 3.1 mbd in 2016, comparing to 0.7 mbd in 2009. According to IEA, these 2016 numbers represented 26% of China’s domestic demand and 41% of its crude imports (IEA 2017: 60). Latin America was not an exception in China’s global oil expansion, and Brazil has hosted most of the deals inside the region (Alves 2013: 117). As mentioned above, Spanish and Portuguese companies Repsol and Galp –owner of Petrogal– respectively transferred part of their activities in the country to Chinese counterparts (Vasquez 2018: 7). Additionally, opportunities brought by 2008 global crackdown might also explain why the majority of Chinese FDI in Brazil was through M&A –US\$ 20.4 billion.

The devaluation of Brazilian currency has also made local assets look more attractive to foreign eyes (Ferreira 2019: 996) (Cui 2017: 16). Between 2008 and 2019, the Real has devaluated around 115% (Investing 2020), making properties cheaper in dollar terms. This condition, coupled with the difficult financial situation of some companies operating in Brazil, have given COC a chance to purchase resources cheaply (Leao and Puty 2018: 3).



Brazil's political and legal changes over time have equally influenced investment landscape. After the discovery of pre-salt fields, Brazil passed a law in 2012 that introduced the production-sharing contract (PSC) system, created the state-owned company Pre-sal Petroleo S.A. to participate in sub-salt auctions and established a minimum participating share of 30% for Petrobras in all consortia (Husar and Best 2013: 14). This move is usually pictured by Chinese scholars as nationalist (Cui 2015: 49) (Cui 2017: 19) (Wu 2019: 5).

From 2016 on, a series of legal and political changes started to attract more foreign investors to Brazil's oil sector, therefore opening a "window of opportunities" for COC, according to some scholars (Cui 2017: 18) (Hogenboom 2017: 202) (Zhou 2017: 30) (Zhong 2016: 86) (Leao and Puty 2018: 3) (IEA 2017: 55) (Xu 2017: 37). Labor law was reformed and became more flexible, Petrobras's mandatory minimum 30% operating stake in unlicensed pre-salt acreage was removed –although the company kept preferential rights– and the local content requirements were lessened. For instance, between the 5<sup>th</sup> and the 13<sup>th</sup> Bidding Rounds of Exploration Oil Blocks, in 2003 and 2015 respectively, the average local content requirement in exploration and development phases was 74% and 82%. In the 14<sup>th</sup> and 15<sup>th</sup> Rounds –in 2017 and 2018–, this requisite dropped to 39% and 18% in the exploration phase and to 43% and 30% in the development one (ANP 2020).

All circumstances described above have pushed many NOC into problems. Some of them went into bankruptcy and sold their assets. Others, such as Petrobras, had to reconsider its previous mid and long-term projections. For instance, Petrobras' production has varied substantially and it has even decreased in several years, like in 2012, 2013, 2017 and 2018, a situation that has forced it to postpone E&P expansion plans and financial recovery schemes. Under severe capital scarcity, Petrobras saw in international partnerships –technological, operational, financial– a way to help it invest in pre-salt. In this process, it has joined hands with several COC, which kept investing in the country even in moments of economic and political uncertainty (Rosito 2017: 10). It is worth remembering that only COC decided to participate with Petrobras in the first Surplus Production Sharing bidding in 2019, an auction that all major IOC rejected to join.

**Table 5: Brazil's Bidding Rounds for Oil Blocks (1999-2019)**

2019	1st Transfer of Rights Surplus Production Sharing Bidding Round
	16th Bidding Round for Exploration and Production of Oil and Natural Gas
	6th Production Sharing Bidding Round
2018	15th Bidding Round for Exploration and Production of Oil and Natural Gas
	5th Production Sharing Bidding Round
	4th Production Sharing Bidding Round
2017	14th Bidding Round for Exploration and Production of Oil and Natural Gas
	3th Production Sharing Bidding Round
	2th Production Sharing Bidding Round
	4th Bidding Round - Areas with Marginal Accumulations
2015	13th Bidding Round for Exploration and Production of Oil and Natural Gas
	3th Bidding Round - Areas with Marginal Accumulations
2013	12th Bidding Round for Exploration and Production of Oil and Natural Gas
	11th Bidding Round for Exploration and Production of Oil and Natural Gas
	1th Production Sharing Bidding Round
2008	10th Bidding Round for Exploration and Production of Oil and Natural Gas
2007	9th Bidding Round for Exploration and Production of Oil and Natural Gas
2006	2th Bidding Round - Areas with Marginal Accumulations
2005	7th Bidding Round for Exploration and Production of Oil and Natural Gas
	1th Bidding Round - Areas with Marginal Accumulations
2004	6th Bidding Round for Exploration and Production of Oil and Natural Gas
2003	5th Bidding Round for Exploration and Production of Oil and Natural Gas
2002	4th Bidding Round for Exploration and Production of Oil and Natural Gas
2001	3th Bidding Round for Exploration and Production of Oil and Natural Gas
2000	2th Bidding Round for Exploration and Production of Oil and Natural Gas
1999	1th Bidding Round for Exploration and Production of Oil and Natural Gas

Source: ANP.

The Brazilian government has equally sped up oil blocks bidding schedule, opening more opportunities to national, international and Chinese oil corporations (IEA 2017: 55) (Cui 2017: 19). Only between 2017 and 2019, it organized ten bidding rounds –the same number of rounds between 2005 and 2015. In these three years, 467 blocks were offered and 192 were auctioned (ANP 2020).

Lastly, it is interesting to highlight that these new legal changes faced opposition from nationalist voices that have historically expressed concerns about participation of COC. Hostility to Chinese investments and products in the past has already prompted then-President Dilma Rousseff to publicly warn against “dumb xenophobia”, when referring to protests against COC’s participation in pre-salt auctions (Winter and Stauffer 2013) (Hogenboom 2017: 200).

This kind of manifestation usually derives from the state nature of COC. Although these are market-oriented and tend to put profit first –their foreign arms are indeed registered at international stock markets–, COC are expected to fulfill China’s overall objectives established in the country’s five-year plans (Wu 2019: 29). Likewise, central administration plays an important role in the oil sector’s strategic planning, personnel nomination and other important issues (Wu 2019: 23). General managers are commonly chosen by the Department of Organization of the Communist Party of China and the State-owned Assets Supervision and Administration Commission of the State Council (SASAC), a governmental special commission responsible for overseeing SOE’s activities. COC’s executive-directors are normally ranked at vice-minister level and carry out commercial and political roles (Hogenboom 2017: 180). Moreover, COC’s foreign investments of over US\$ 30 million are usually ratified by the National Development and Reform Commission (NDRC) and those over US\$ 200 million require approval by the State Council (Wu 2019: 35). The complex relationship between COC and Chinese state makes less clear whether they actually do compete with each other abroad –they face little competition in the protected domestic oil sector– and whether their investment decisions are independent from political influence (Hogenboom 2017: 209). Another concern is that COC were selling their overseas production only and directly to China, possibly with lower prices.

However, evidence shows that COC are driven more by commercial interests. As seen above, in periods of decreasing oil prices, they pulled back investments nationally and internationally, which were resumed when rates had upward vitality. Furthermore, indications so far suggest that they sell their oil in global markets, where they can sometimes get better prices, instead of shipping it straight to China –when they do–, whose distance makes transportation costs higher and where internal prices are tightly controlled by Chinese state, lowering profit margins (Vasquez 2018: 13) (Economy and Levi 2014: 43).

It is unknown how much of overseas oil is effectively sent to China, this information is not commonly disclosed by companies or governments. In Brazil, there are no separate numbers for companies’ exports/imports. However, it seems that there is no direct relationship between COC’s production in a specific country and what is imported by China from that nation, because profitability and corporate strategies mostly drive COC’s activities abroad (Vasquez 2018: 2) (Economy and Levi 2014: 52).

The 2012 white paper on energy policy states that 90% of Chinese enterprise-invested energy resources abroad are sold locally (StateCouncil, 2012), therefore augmenting the available resources in the world market and contributing to a safer global energy balance (Liao 2015: 91) (IEA 2014: 16) (Hogenboom 2017: 181).<sup>17</sup>

## Economic opportunities to engineering and machinery companies

With a booming oil production, Brazil needed investments in all the supply chain, turning into an opportunity for Chinese engineering contractors and machinery companies. Global exports of these firms’ products and services have expanded exponentially in the last decades in all energy fields, usually tied to the participation of Chinese firms in other countries’ projects (Kong 2019: 47). Indeed, COC’s investments in Brazil, although concentrated upstream, also diversified itself to other ones, including construction of floating production storage and offloading units (FPSOs), port logistics, among others (Leao and Puty 2018: 24). As discussed above, engineering services have served as a gateway to Sinopec’s entrance in the country, with the Gasene project in 2006.

Brazil’s economic situation has also helped boost COC’s investments. The country’s GDP growth (annual %) has declined between 2010 and 2016 –except in 2012. There were negative rates in 2009, 2015 and 2016. These last two years represented the worst recession in three decades (World Bank 2020). Additionally, the corruption scandal investigated by the Car Wash Operation has pushed all domestic oil industry into a crisis, and the economic slowdown has let many Brazilian shipyards into bankruptcy. Chinese firms came to take up this space.

This situation was aggravated by the flexibilization of local content requirements (Leao and Puty 2018: 27), since requirements for FPSO design, equipment and construction, for instance, have decreased 40% to 25% in 2015 (HIS Markit 2019: 20). These requirements were always regarded as an obstacle for the expansion of Chinese machine manufacturers in Brazil. CNPC’s decision to invest in the equipment maker Bomcobras was seen as an option for meeting these conditions (Husar and Best 2013: 16).

Analyzing the number of FPSO built by Chinese shipyards seems to be a good evidence of how Chinese engineering contractors have grasped the opportunity open by Brazil’s economic crisis and legal changes. Between 2000 and 2019, 20 out of 39 FPSO that Petrobras contracted, partial or entire construction abroad was done in Chinese dockyards, a tendency that was intensified in the second decade of the period.

<sup>17</sup> Some voices highlight that the fact that COCs are state-owned gives the government a high hand in the decision of where to export the oil in the eventuality of a disruption of world supply or a sharp upsurge of demand (Liao 2015: 80).



## Technological cooperation

Over the decades, Petrobras has acquired leading technology expertise in ultra/deep water drilling, an area in which COC historically lacked experience and were willing to gain technical know-how (Husar and Best 2013: 13) (IEA 2014: 16) (Kong 2019: 48) (Xu 2017: 37) (Cui 2015: 48) (Zhou 2017: 31). This new technologies and managerial skills could be used in other overseas E&P projects or even in Chinese fields. The difference of capabilities of both sides was immense. In 2015, Brazil possessed 172 registered patents of deep-sea exploration technology, and China, only 9 (Liu 2015: 28).<sup>18</sup>

Sinopec was the most interested in accessing this knowledge, but was not successful in the early partnership attempts with Petrobras (Husar and Best 2013: 31). It has tried joint-production with the Brazilian oil giant, as in the acquisition of two blocks at Para-Maranhao basin in 2011. One of them was resold to Petrobras years after.

Unable to develop the required top-end drilling skills in the short term, COC resorted to buying equity from other players in Brazil or to participating in bidding rounds alongside other technologically more mature oil companies (Alves 2013: 122).<sup>19</sup> Sinopec's move to buy 40% of Repsol in 2010 and 30% of Petrogal in 2011 were in line with this strategy (Schutte and Debone 2017: 100).<sup>20</sup> CNOOC and CNODC's participation with Petrobras and other IOC in pre-salt auctions is another example.

## Conclusion

The history of Brazil-China oil cooperation is a book with four chapters: trade, FDI, infrastructure projects and loans. In each pillar, there was a remarkable evolution in the last two decades which deserves to be accurately quantified, described and interpreted under national and international circumstances. The aim of the present article is to understand how deep China has penetrated in Brazil's oil sector in terms of investments and related services and how this process has evolved over time and impacted both sides.

As shown above, capital in the form of FDI have flown in big quantities to Brazil. FDI and infrastructure projects have reached approximately US\$ 27.9 billion. Investments entered the country mainly through M&A, consolidating it as China's biggest destination of oil investments. All big four COC are operating in Brazil, with activities concentrated in upstream. As a group, they accounted for 3.2% of national E&P figures in 2019 –in contrast to 0.7% in 2011–, being the third largest producers.

Throughout the supply chain, other Chinese machinery and service firms, such as Jiangsu Asian Star Anchor Chain, BGP, Shandong Kerui Petroleum Equipment, Bomco, and Guangdong Zhenrong Energy, have started operations in the South American country. China's shipbuilders became Brazil's main constructors of FPSO, which is an important step, since Petrobras was the world's largest FPSO purchaser in the period.

In both pillars studied in this piece, Petrobras was undeniably COC's most important partner. It was also in partnership with the company that they invested in Brazil and that several service providers have obtained EPC contracts.

Behind all these investments, one of their main driving forces was the discovery of massive untapped reserves in an area hitherto unexplored: pre-salt. Local and international circumstances have also created an attractive scenario to cash-surplus COC. In any case, favorable economic conditions were imperative factors. Whereas Chinese firms were looking for new opportunities in promising and stable regions, Petrobras was searching for partners to help it explore the new bonanza.

The kind of commitments made by COC in Brazil, such as winning rights of exploration that will last for three decades in average, enhances the desirability and inevitability of a long-term partnership. Chinese players seem to believe in the optimistic prospects of Brazil's oil market and to trust in the country's market and regulatory policies. As an illustration, some loans were agreed in times of global crisis and severe financial distress of Petrobras, a situation that has put away most of the company's other traditional financiers. In 2019, in an auction in which most IOC refrained from participating, two COC increased their bets in Brazil's future forecasts and joined hands with Petrobras to explore Buzios, one of the most promising pre-salt oil fields in Brazil.

The willingness of forming a long-term partnership is equally seen in Brazil's perspective. China became a strategic and pragmatic option not only to help solve problems experienced in the national oil sector over the last few years, but also to make full use of the new pre-salt oil frontier.

Upcoming prospects look promising. Brazil's oil outlook is encouraging. Pre-salt production will rise, since more fields might enter in full production. Under this scenario, COC with sub-salt assets will extract more petroleum, probably becoming even more relevant producers in national terms. Oil auctions' calendar will continue in the next years, and COC might keep the same interest and participation as seen in the recent past. Based upon the experience of the last two decades, there is no reason not to believe that Brazil-China oil cooperation will reach new heights in the near future.

18 Interestingly, when Petrobras was still in the early process of developing this expertise in the 1980s, it signed a technology transfer agreement with CNOOC about offshore exploration in China (Xu 2017: 53).

19 Chinese academic institutions also established cooperation agreements with Brazilian counterparts. For instance, in 2009, Tsinghua University and Federal University of Rio de Janeiro jointly formed a technological partnership for researching, among other subjects, deep-water oil exploration (Leao and Puty 2018: 26).

20 These acquisitions have also allowed the Chinese company to access sub-salt oil fields, another of its targets.

**Appendix–List of Chinese oil & gas FDI and infrastructure projects in Brazil (2006-2019)**

DATE	CHINESE COMPANY	PROJECT DESCRIPTION	SUB-SECTOR	USD MI	TYPE	FORM OF ENTRY
2019	CNODC	Annual investments in R&D.	R&D	0.8	FDI	greenfield
2019	CNOOC	Annual investments in R&D.	R&D	0.8	FDI	greenfield
2019	Sinochem	Annual investments in R&D.	R&D	3.5	FDI	greenfield
2019	Petrogal	Annual investments in R&D (chinese part).	R&D	6.5	FDI	greenfield
2019	Repsol Sinopec	Annual investments in R&D (chinese part).	R&D	5.7	FDI	greenfield
Nov-19	CNODC	20% stake in oil field Aram.	upstream	259.9	FDI	greenfield
Nov-19	CNODC	5% stake in oil field Buzios.	upstream	835.1	FDI	greenfield
Nov-19	CNOOC	5% stake in oil field Buzios.	upstream	835.1	FDI	greenfield
Jun-19	JASAC	Anchoring services to Petrobras.	-	0.5	service	-
2018	CNODC	Annual investments in R&D.	R&D	0.6	FDI	greenfield
2018	CNOOC	Annual investments in R&D.	R&D	0.6	FDI	greenfield
2018	Sinochem	Annual investments in R&D.	R&D	5.1	FDI	greenfield
2018	Petrogal	Annual investments in R&D (chinese part).	R&D	6.3	FDI	greenfield
2018	Repsol Sinopec	Annual investments in R&D (chinese part).	R&D	6.1	FDI	greenfield
Sep-18	CNOOC	30% stake in oil field Pau Brasil.	upstream	55.7	FDI	greenfield
Sep-18	BDG Brasil	Seismic data analysis service to Petrobras.	-	32.5	service	-
Jun-18	Petrogal	14% stake in oil field Uirapuru	upstream	31.2	FDI	greenfield
May-18	PetroChina	Acquisition of TT Work (30%).	downstream	992.7	FDI	brownfield
Mar-18	Petrogal	20% stake in oil block C-M-791.	upstream	13.3	FDI	greenfield
2017	CNODC	Annual investments in R&D.	R&D	0.002	FDI	greenfield
2017	CNOOC	Annual investments in R&D.	R&D	0.002	FDI	greenfield
2017	Sinochem	Annual investments in R&D.	R&D	1.1	FDI	greenfield
2017	Petrogal	Annual investments in R&D (chinese part).	R&D	4.3	FDI	greenfield
2017	Repsol Sinopec	Annual investments in R&D (chinese part).	R&D	4.9	FDI	greenfield
Oct-17	CNOOC	20% stake in oil field Alto de Cabo Frio Oeste.	upstream	31.1	FDI	greenfield
Oct-17	CNODC	20% stake in oil field Peroba.	upstream	133.1	FDI	greenfield
Oct-17	Repsol Sinopec	25% stake in oil field Entorno de Sapinhoá.	upstream	6.2	FDI	greenfield
Oct-17	Petrogal	20% stake in oil field Norte de Carcará.	upstream	58.4	FDI	greenfield
Sep-17	CNOOC	100% stake in oil block ES-M-592.	upstream	12.9	FDI	greenfield
Sep-17	Shandong Kerui	51% stake in EPC contract with Petrobras for building natural gas processing facility at Comperj.	upstream	300.9	service	-
2016	Petrogal	Annual investments in R&D (chinese part).	R&D	2.6	FDI	greenfield
2016	Repsol Sinopec	Annual investments in R&D (chinese part).	R&D	2.9	FDI	greenfield
Sep-16	CIC	8.5% stake in Nova Transportadora do Sudeste (NTS).	middlestream	441.2	FDI	brownfield
May-16	Sinopec	Sold to Petrobras 20% stake in oil block BM-PAMA-3.	upstream	-	FDI	brownfield
2015	Petrogal	Annual investments in R&D (chinese part).	R&D	1.4	FDI	greenfield
2015	Repsol Sinopec	Annual investments in R&D (chinese part).	R&D	2.9	FDI	greenfield
Oct-15	Tek Óleo e Gás	100% stake in oil block REC-T-153 (HLJW group).	upstream	2.6	FDI	greenfield
Aug-15	JASAC	Anchoring services to Petrobras.	-	5.0	service	-
Mar-15	JASAC	Anchoring services to Petrobras.	-	0.01	service	-
Mar-15	JASAC	Anchoring services to Petrobras.	-	5.4	service	-
2014	Sinochem	Annual investments in R&D.	R&D	8.0	FDI	greenfield
2014	Petrogal	Annual investments in R&D (chinese part).	R&D	1.5	FDI	greenfield
2014	Repsol Sinopec	Annual investments in R&D (chinese part).	R&D	2.8	FDI	greenfield
Nov-14	JASAC	Anchoring services to Petrobras.	-	11.4	service	-
Oct-14	JASAC	Anchoring services to Petrobras.	-	4.8	service	-
Mar-14	JASAC	Anchoring services to Petrobras.	-	46.6	service	-
2013	Sinochem	Annual investments in R&D.	R&D	9.0	FDI	greenfield

Sources: Author's calculation based on multiple sources.

## Continuation appendix 1

2013	Petrogal	Annual investments in R&D (chinese part).	R&D	1.2	FDI	greenfield
2013	Repsol Sinopec	Annual investments in R&D (chinese part).	R&D	0.7	FDI	greenfield
Dec-13	Sinopec	Pipeline maintenance contract at Comperj with Petrobras.	middlestream	12.4	service	-
Nov-13	PetroChina	Acquisition of all Petrobras' assets in Peru.	upstream	2600.0	FDI	brownfield
Oct-13	CNOOC	10% stake in oil field Libra.	upstream	691.5	FDI	greenfield
Oct-13	CNODC	10% stake in oil field Libra.	upstream	691.5	FDI	greenfield
May-13	Petrogal	Multiple oil blocks' acquisitions in three basins: Barreirinhas, Parnaíba and Potiguar.	upstream	24.4	FDI	greenfield
2012	Sinochem	Annual investments in R&D.	R&D	6.4	FDI	greenfield
2012	Petrogal	Annual investments in R&D (chinese part).	R&D	1.0	FDI	greenfield
2012	Repsol Sinopec	Annual investments in R&D (chinese part).	R&D	1.0	FDI	greenfield
2012	Repsol Sinopec	Investments in pre-salt E&P.	upstream	947.0	FDI	brownfield
Aug-12	Repsol Sinopec	Increase of stake to 20% in oil field BM -ES-21.	upstream	-	FDI	brownfield
Mar-12	Sinopec	EPC contract with Petrobras to build Regasification Terminal of Bahia (TRBA).	downstream	48.8	service	-
Jan-12	Sinochem	Acquisition from Perenco of 10% stake in five oil blocks at Espirito Santo basin.	upstream	-	FDI	brownfield
2011	Petrogal	Annual investments in R&D (chinese part).	R&D	0.2	FDI	greenfield
2011	Repsol Sinopec	Annual investments in R&D (chinese part).	R&D	0.8	FDI	greenfield
Nov-11	Sinopec	Acquisition of 30% of Petrogal Brasil.	upstream	5190.0	FDI	brownfield
Oct-11	Bomco	34% stake in factory in partnership with Asperbras and Brasil China Petroleo.	manufacturing	25.0	FDI	greenfield
Aug-11	Sinopec	51% stake in joint venture with Galvão Engenharia and GDK to construct Petrobras' Fertilizer Unit in Tres Lagoas (MS).	downstream	994.5	service	-
May-11	Sinopec	EPCC contract with Samarco to build pipeline.	middlestream	399.9	service	-
Apr-11	Sinopec	Acquisition from Petrobras of 20% stake in oil blocks BM-PAMA-3 and BM-PAMA-8.	upstream	-	FDI	brownfield
2010	Repsol Sinopec	Annual investments in R&D (chinese part).	R&D	1.0	FDI	greenfield
Oct-10	Sinopec	Acquisition of 40% of Repsol Brasil.	upstream	7111.0	FDI	brownfield
May-10	Sinochem	Acquisition from Statoil Petróleo Brasil Ltda of 40% in oil blocks C -M -529 and C -M-530 (Pitangola field).	upstream	-	FDI	brownfield
May-10	Sinochem	Acquisition from Statoil Petróleo Brasil Ltda of 40% stake in oil field Peregrino.	upstream	3070.0	FDI	brownfield
Apr-10	Repsol Sinopec	Service contract with Petrobras related to Unit Stena Drillmax 1.	-	0.1	service	-
Dec-07	Sinopec	EPC contract with Petrobras to build pipeline Gascac (part of pipeline Gasene).	middlestream	1661.0	service	-
Apr-06	Sinopec	EPC contract with Petrobras to build pipeline Gascav (part of pipeline Gasene).	middlestream	239.0	service	-

Sources: Author's calculation based on multiple sources.

## Methodological notes

This work has resorted to four research methods to measure Chinese investments in the Brazilian oil and gas sector: (i) investment databases, (ii) media monitoring, (iii) literature review, and (iv) qualitative interviews.

The following databases were used in this paper: China-Mexico Studies Center (Cechimex) and Academic Network for Latin America and the Caribbean on China (Red ALC-China) (Peters 2020), Boston University's Global Development Policy Center (GDPC 2020), Brazil-China Business Council (CEBC 2019), Brazilian Ministry of Economy (ME 2019), Brazilian Central Bank, Aid Data (Aid Data 2017), and American Enterprise Institute (AEI 2020), among others.

Their information was complemented and verified with data from the National Agency of Petroleum, Natural Gas and Biofuels (ANP, in Portuguese). As the regulatory agency responsible for executing national policies for the oil sector and supervising more than 110 thousand firms in Brazil's upstream (E&P), middlestream (transportation, storage and wholesale marketing of crude oil), and downstream (oil refining and distribution) areas (ANP 2020), it provides a thorough set of reports with detailed and accurate information about greenfield investments –related to its auctions– and brownfield deals<sup>21, 22</sup>.

In this sense, ANP informs numbers related to bonuses, bidding taxes, and the values invested by oil companies as part of the minimum exploratory program (“programa exploratório mínimo”; PEM, initials in Portuguese). PEM

<sup>21</sup> The capital involved in brownfield transactions are not disclosed by ANP.

<sup>22</sup> Interestingly, ANP's reports are not commonly referred as a source, probably because information about projects, such as estimated capital to be invested, companies involved, R&D figures and others, are spread in numerous technical documents, whose reading is not easy for non-specialized readers. Another barrier might be the language, the data is mainly in Portuguese.

corresponds to a set of exploratory activities that must be performed by concessionaires during the exploration phase of oil wells (ANP 2019). After auctioning them, corporations must present a detailed plan of investments aiming at examining the economic and production viability of the asset, an obligation supervised by ANP.<sup>23</sup> Furthermore, ANP equally provides information about disbursements in R&D, another legal obligation of concessionaires. Both PEM and R&D are exceptionally included in academic works and reports.

Academic articles, reports of policy-advising institutions and oil firms, media accounts, interviews with representatives from government, companies, civil society organizations, and experts were also useful sources.

In all cases mentioned, only confirmed projects are considered. Announced investments are debated, but their values are not included in total figures.

For those values originally in Brazilian Reais, the exchange rate BRL/US\$ is that of the day of the transaction, including greenfield deals. If there is no specific date, it is the rate of the last working day of the year.

The numbers presented here –investments, barrels etc.– reflect the real ownership stake of Chinese companies in each specific project. Therefore, for Petrogal and Repsol-Sinopec projects, it is just considered Sinopec's share at them: Petrogal (30%) and Repsol Sinopec (40%).

Last but not least, given the difficulty of finding investments and loans information, the figures here should only be seen as tendencies, estimates, but not absolute numbers.

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<sup>23</sup> In the end of the exploration phase, if the oil block is considered economically viable, a declaration of commerciality (“declaração de comercialidade”) is made, and the concessionaire will present a development plan (“plano de desenvolvimento”), with detailed measures and financial investments to be taken into place, so as to extract oil from the field. Unfortunately, this plan has not been disclosed.



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*El Centro de Estudios China-México de la Facultad de Economía de la Universidad Nacional Autónoma de México tiene el agrado de invitar al público en general a presentar artículos para su posible publicación dentro de su revista, "Cuadernos de Trabajo del Cechimex".*

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