

Oil fiscal regimes and national oil companies: A comparison between Pemex and Petrobras



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ARTICLE INFO

Keywords:

National oil company
Oil fiscal regime
Petrobras
Pemex

ABSTRACT

Analysis of the determinants of the performance of national oil companies (NOCs) is and has always been among the most discussed topics in specialized literature. In this context, the uneven path experienced by two major Latin American NOCs – Petrobras and Pemex – is striking. Our work seeks to explain the uneven performance, focusing on the productive aspects. In particular, we analyze the oil fiscal regimes in Brazil and Mexico as a very crucial aspect – though not the only one – within oil-rich countries that may shed light on the disparities between Petrobras and Pemex. The contribution of our work to the existing literature derives from the relationship that we establish between the characteristics of the respective oil fiscal regimes and the productive performance of the two NOCs, with special consideration paid to the ways in which a fiscal regime contributes, or not, to promoting and guiding the investment efforts of companies. We compare investment, production, and reserve indicators of Pemex and Petrobras and conclude that the Mexican and Brazilian oil fiscal regimes can largely explain the productive and investor performance of both NOCs.

1. Introduction

Latin America has historically had cases of industrialization and modernization from natural resources, particularly from oil. Among the most relevant experiences in the region are certainly the cases of Brazil and Mexico. Both experiences shared some features in the second half of the twentieth century: strong industrialization, a major oil and gas industry, all-powerful national oil companies (NOCs), and a State that acted as a driver of development.

However, at the beginning of the 21st century, the differences between Brazil and Mexico became more meaningful, and the commonalities gave way to divergent developments. Among those differences, the performance of their respective oil industries remains highly significant, in particular the behavior of their NOCs – Petrobras in Brazil and Pemex in Mexico. In both countries, the oil industry plays a key role, and both Petrobras and Pemex are considerably more than public companies: they are key players in economic dynamics. However, while the current role of Petrobras is reflected in its contribution to energy policy, and especially to Brazilian industry, the role of Pemex is significantly limited to the tax field, as a generator of revenue for the State. Recently, Mexico began implementing an energy reform (December 2013) that aims to imbue Pemex with the same

productive, technological, and competitive capabilities as other public oil companies, such as Petrobras or Statoil. In fact, Brazil has also faced changes in its oil fiscal regime (OFR), as will be reflected throughout the work.

Considering these aspects, our work will show the importance of some political and institutional factors to explain the behavior of the NOC, especially its productive performance. In particular, we try to explain how the specific (and very different) OFRs of each country condition the performance (also differing greatly) of each NOC. We define the OFR as the set of rules, laws, regulations and agreements which governs the incomes derived from oil and gas (O & G) exploration and exploitation; therefore, the OFR regulates transactions and links between the state and the companies involved (Gudmestad et al., 2010). Meanwhile, analysis of the performance of the companies will be restricted to productive aspects such as investment, production, investment, and reserves (see Section 2 for more detail).

From this approach, our paper aims to identify the specific features of each OFR and its influence on the working and performance of both NOCs, Petrobras and Pemex, in terms of their structural nature and the prominence of the O & G industries in the economies of Brazil and Mexico. In this paper, we try to answer the following questions: What differences have been effected in the OFRs of Brazil and Mexico from

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the 1990s until 2014?¹ And are those differences sufficiently important factors to explain the uneven performance of Petrobras and Pemex?

To answer these questions, we will carry out structured case studies; this is a methodology that we consider very suitable for analysis of the proposed causal link (between the OFR and NOCs performance) when only two countries are under study, in which case cross-country methodology research is invalid. Methodology based on structured cases studies allows a deep comparative analysis of the elements that characterize the causal link between both variables in each of the countries.² To carry out the structured case studies, we have systematically reviewed the existing literature (reflected in the final bibliography) and we have used primary data from official databases (national and international) or provided by the companies themselves.³

Brazil and Mexico were selected for several reasons: for the importance of Petrobras and Pemex and their respective economies; for the differences between the OFRs in each case; and because the current efforts toward energy reform in Mexico take the Brazilian approach as a role model. We believe that these aspects are very revealing to better understand the limits and possibilities of the development process that resource rich economies face, especially in Latin America. After studying several Latin American economies (Argentina, Brazil, Bolivia, Ecuador, Guatemala, Mexico, among others) and different sectors (automotive, electric, oil & gas, textile) in previous research, we believe that a comparative analysis of two large NOCs in the two largest economies in the region will improve understanding of the contribution that resources like oil & gas can make in pursuing the challenge of development.

In order to do this, after situating our work in the current debate around OFR and NOC performance, we analyze two case studies, Brazil (Petrobras) and Mexico (Pemex), from which we can draw conclusions that respond to questions raised.

2. Theory: oil fiscal regimes and NOCs

The creation and strengthening of the NOCs have been key in countries with abundant O&G reserves. This is mainly due to the strategic nature of the O&G industry and its potential as a source of income. As a result, the objectives of different development strategies are one of the key determinants of the NOCs' strategies, strongly influencing their performance (V́ictor et al., 2012).

Stevens (2003) delves into the relationship between the State and the NOC and notes that the role assigned to such companies vis-à-vis development strategies causes a conflict between "national objectives" (the State) and "commercial objectives" (firms) that "create an impossible no-win dichotomy [...]. Either the NOC exerted its will and pursued its own goals which were likely to lead to takeover of the State, or the State exerted its will and effectively inhibited the NOC from operating effectively" (Stevens, 2003:11). Mommer (1994) goes further as he consider that the NOC is conceived to collect revenues for the State (rentier states, Evans, 1989) and that, as a result, tensions arise between the State, which wants to collect more revenue, and commercial objectives. This approach underlies the idea that it is impossible to reconcile commercial and national objectives and that the OFR is the key determinant of how this tension is resolved in favor of one or the other targets.

From this, we can identify areas of policy, which determine the

¹ The analysis is extended to 2014 to display a medium-term perspective, which is necessary given the technological and productive particularities of the sector. We end the analysis at 2014 to avoid the strong influence that exogenous factors to OFR (particularly the sharp decline in oil prices) have had on oil revenues, investment, and production.

² See V́ictor et al. (2012), and Luong and Weinthal (2010), who have used a similar methodology to likewise analyze different aspects of institutional framework and NOCs performance.

³ Official databases: International Energy Agency, National Petroleum Agency (Brazil) and Mexican Hacienda. Databases of companies: Petrobras Annual Reports, Statistical Yearbooks Pemex and Pemex (2013).

performance of NOCs and in which these firms also play a particularly prominent role. The literature agrees by highlighting the OFR as key to "escaping" the resource curse (Eifert et al., 2002; Mehlum et al., 2006; Luong and Weinthal, 2010). Moreover, most of these authors also agree that analysis of this policy should be made not only from the perspective of the tax system that determines the distribution of income among the different actors (a most frequent perspective), but should also include analysis of the mechanisms which determine the use of the incomes by the State (including to the NOC). It is the joint analysis of the two elements what allows to explain more precisely the relationship between OFR and performance of the NOC. Therefore, our analysis of the OFR must include both dimensions. As noted, the OFR is the set of rules, laws, regulations and agreements that guide the distribution and use of O&G incomes. However, the mechanism that allows the OFR to be linked with the productive performance of the NOC is principally how it affects (by promoting or not promoting) investment by the NOC. This is true for two main reasons: a) in the case of public companies, investment decisions of the NOC – which are part of the overall strategy of the company – can be clearly influenced by governments, according to their developmental strategies; and b) investments and exploration successes are the key variables that determine the productive performance of the company (as measured by its ability to reproduce the oil cycle, producing and increasing reserves at least at the rate of production). Therefore, the key issue for analysis is whether the OFR supports or undermines productive investment of the NOC, and to identify in each case the precise way in which this occurs. This is not to say that productive performance depends solely on the OFR – it is influenced by many other factors, both external and internal to the company – but the OFR is certainly a key variable that justifies the current analysis. For this reason, we believe that the OFR can be treated as an independent variable, not in order to quantify the degree of influence between the OFR and performance by the NOC, but to illustrate the mechanisms through which these variables are related, in two different models (neodevelopmentalist in Brazil, rentier in Mexico), in order to clarify the limitations that exist in both cases.

Therefore, and given that limitations of space forbid development of a comprehensive study of the performance for each company, this paper will focus on the capacity of each NOC to ensure the reproduction of the oil cycle – i.e., productive development, leading us to include investment, production, and reserves as key indicators (see diagram below).

3. Results and discussion

3.1. The Brazilian oil fiscal regime

The founding of Petrobras goes back to the 1950s and, as in the case of Pemex (founded earlier), it occurs in a context marked by developmental strategies specially focused on industrialization. Despite this relative affinity, one key issue differentiated the two companies for decades: the abundance of oil reserves in Mexico, and their scarcity in Brazil. This fact, coupled with the aforementioned development strategy, determined the industrializing orientation of a company that was able, from its very inception, to obtain greater autonomy in management than other Brazilian public companies. Petrobras also had strong financial support from the State through tax benefits and other financial resources to ensure the company's promotion of local industry for more than four decades (Alveal, 1994). Thus for decades, despite its relative independence, Petrobras remained a key instrument of developmentalism policy.

The arrival of reforms in the Brazilian O&G industry was framed, as in most other countries of the region, by the Washington Consensus. In Brazil, the application of the Consensus elicited specific characteristics resulting from the broad developmentalist legacy. Cypher (2013:202–203) speaks of "neoliberalism by halves" as he argues that,

in Brazil, these policies were never so “complete or firmly anchored in the socioeconomic structure” as they were in most other Latin American countries. Reforms in the O & G industry and subsequently in the OFR are good examples of this “neoliberalism by halves”, incorporating elements of change as well as continuity with the historical monopoly (Paz, 2015). One of the main elements of continuity is related to the control that the State retains over company strategy. This control is formally common to all NOCs, but it has a special significance in Brazil, where Petrobras remains a key instrument in the energy and industrial policy. This implies that, when we try to link OFR with the productive performance of the NOC, it is necessary to pay attention to: i) the direct control that the State exerts over a portion of the rents, usually known as the government take (which the State captures through various taxes, and which is not usually retained within the O & G industry); and ii) indirect control that the State exercises over a portion of the rents captured by the NOC, given that this portion is strongly conditioned by the objectives of industrial and energy policy.

3.1.1. Fiscal regime and distribution of oil revenues

Based on the considerations noted above, we now turn to those aspects of the Brazilian OFR that determine the allocation of oil revenues. Before describing these aspects, it is necessary to clarify that, currently, two regulatory frameworks co-exist within the O & G sector: one that was set in the 1990 and remains in effect for certain areas and concessions, and another that has been defined for the specific development of the pre-salt area. The latter incorporates several changes that are intended to ensure a developmentalist boost from O & G. These changes include the increased participation of the State in Petrobras (raised to 59% of those shares entitled to vote, and 48% of total capital), the creation of a new public company⁴ which manages the new signed contracts, and the obligation of Petrobras to act as operator in all fields with a minimum stake of 30%. Thus, Petrobras maintains its dominant position in the sector, which can slow down the exploitation of O & G reserves depending on the financial and operational capacity of the company. This is a key issue to which we will return later.

Moreover, Law 12.351, approved on 22 December 2010 (*Lei do Pré-Sal*), establishes a production sharing regime (PSR) instead of the concession regime (CR) in effect in other areas since the end of the monopoly. The fundamental difference between the two regimes is that in the CR, companies assume the risk of exploration and production and, consequently, if exploration proves successful, those companies receive ownership of the oil and gas found.⁵ In the PSR, the risk is shared between two or more operators, one of them public, which allows the State to maintain more control over exploration and production (E & P) activities, in addition to retaining ownership of hydrocarbons. All operators are compensated for the “recoverable” operation cost (cost oil) by delivering oil.

Several papers have examined the real advantages and disadvan-

⁴ Law 12.304, of August 2, 2010, established the creation of a company responsible for managing the pre-salt contracts and audit costs, but that new public company (Pré-Sal Petróleo SA, Petro-Sal) wasn't actually instituted until the adoption of Decree 8,063, of August 1, 2013.

⁵ The literature often differentiates between two modalities of the concession regime – early concessions and modern concessions. Following De Oliveira (2010c:25–30), since the end of World War II, and especially during the 1960s and '70s, “the Modern Concession has been developed in response to the worldwide political and economic changes, especially with regards to the relationship between states and foreign oil companies [...] the term “modern” not only suggests a new era in which the contracts are concluded, but also refers to the incorporation of new trends into the contract and an attempt at a rational development of the country's natural resources. The term also denotes the fact that foreign companies were made to assume an obligation to take into account the relevant political, social, and economic interests of developing countries that were overlooked under traditional concessions”. In this regard, the author argues that the current Brazilian concession regime should be understood as a modern concession regime.

tages of PSR over CR and its adequacy to the Brazilian context (De Oliveira, 2012; De Oliveira, 2010c; Sauer et al., 2010; Serra, 2011). Historically, the PSR has been preferred by developmentalist governments for the extent to which it allows, a priori, greater control over production and oil revenues. However, as De Oliveira (2010b:4) notes, CR also allows for this control by raising or reducing taxes on exports of oil and refining products, and through tendering policy.

Beyond historical trends, from the point of view of our work, it is necessary to know the characteristics of the OFRs under both regulatory frameworks, and their consequences in terms of government take. To determine the fiscal regime affecting the oil sector, it is necessary to distinguish between tax and non-tax issues. The former generally include taxes levied on any good or service produced or sold in the Brazilian economy, along with the specific tax on fuels (CIDE). The second category, known as the *government take* (as defined in Article 45 of the Petroleum Act), includes four collection mechanisms with specific impact on the activities of E & P: royalties, special participation, signature bonus and allocation, and area occupancy rate.

The way these resources are distributed among different administrations (local, state or regional, and national) is also fixed in the Petroleum Act (Law no. 9.478, 06/08/1997). Only a few guidelines are mentioned around the use of these resources, focusing on the national government share, which represents but a small fraction of the total collected.

Among the four concepts mentioned above, the two most important (in terms of tax capacity) are royalties and special participation, which represent more than 90% of the government take. Furthermore, both mechanisms (unlike the remaining two) are linked to production, and the percentages for each are established in the Petroleum Act. In the case of royalties, the range varies between 5% and 10% depending on the geological risks, the outlook for production, and other factors considered by the *National Petroleum Agency*, (ANP).⁶ With respect to special participation, which apply only to areas of high production and high returns, these range between 10% and 40% – percentages that apply to the value of production after the deduction of royalties, investments in exploration, production costs, depreciation, and other charges. As in the previous case, the exact percentage is established in the concession contract.

As we noted before, Brazil's pre-salt offshore discoveries prompted the adoption of a new regulatory framework which also included new fiscal rules. This raised some expectations about a possible increase in government take (Serra, 2011). However, the new fiscal rules, in terms of the inclusion of a “government share” fully allocated to the national government, have had little impact on the government take. This “government share” is specially oriented to modifying the redistribution of government take among different administrations. The main collection mechanisms, such as royalties or signing bonuses, remain the same in both regimes. Moreover, although certain tax issues relative to the cost and profit of E & P activities are different in the two regimes – see Rodrigues and Sauer (2015) for details – the criteria for recognition of E & P costs are very similar in both cases, therefore predicting similar results in terms of government take (De Oliveira, 2010c:63).⁷ In sum, the Brazilian OFR determines that the government take in Brazil is significantly below international standards, according to calculations made by the World Bank (Barma et al., 2012:162).⁸ But

⁶ The ANP is in charge of promoting regulation, contracting, and supervision of integrated economic activities in the oil, natural gas, and biofuels industries (Article 8, I, Chapter IV of Law No. 9.478/97). The ANP has been the key agency responsible for ensuring the transformation of the State monopoly. One of the most important functions of the ANP is to implement the various bidding rounds. Through bidding, different oil fields are awarded to companies for exploration and production in a process of free competition.

⁷ Estimation by Rodrigues and Sauer (2015) indicates that government take may be lower in a field operated under PSR.

⁸ There is no consensus in the literature on the most appropriate methodology to calculate the government take in O & G revenues. Estimates vary depending on the taxes

as Agalliu (2011:47) notes, the government take can be quite misleading if the criteria used for its calculation and the characteristics of oil and gas exploitation in different countries are not known. Indeed, this indicator is often used to show the gap between private and public share in O & G revenues, which sometimes involves adding State and/or NOC revenues to the government take category.⁹ However, in this work our interest is focused precisely on the sharing of O & G revenues between the State and the NOC in two countries characterized by the prominence of the NOC in the exploitation of reserves.¹⁰

Following on our argument, it is crucial to analyze the distribution of O & G revenues between the State and the NOC, to assess whether the former is expressing what might be called 'rentier eagerness'. The data in Table 1 show that in relation to income, the average State share for the period 2000–2014 stood at 22% if we include only the specific tax forms, and at 36% if we include non-tax forms of collection. If we consider operating profit (income minus production costs), the State's share amounts to 26% and 43%, respectively.

The particularity of the Brazilian case is that, despite the nominal end of the monopoly, Petrobras remains responsible for over 90% of production; that is to say, Petrobras generates most of the O & G revenues in the country. Therefore, the OFR allows the public company to retain a majority share of the income generated by the exploitation of O & G, which in absolute terms represented a significant rise in Petrobras' operating profits between 2000 and 2014 (see Table 1).¹¹ This situation, which has gone on for a decade, is seen by Emilio Silva (2010:52) as a virtuous circle made possible thanks to high oil prices and successful exploration by Petrobras. However, since 2013, the drop in oil prices have modified these conditions, implying major financial constraints to E & P activities. The following section will return to this.

In sum, from the point of view of the government take in O & G incomes, the Brazilian OFR departs from a rentier model in which a major share of the incomes would go to the treasury to fund activities not related to O & G industry. This means that the Brazilian state *directly* captures a lower share (in relation to international standards) of O & G revenues; but given its majority stake in the company, the *indirectly* controlled income captured by Petrobras represents more than half of O & G income. Such indirect control over income has enabled various administrations to influence the strategic decisions of the company, particularly in terms of capital investments. As noted in Section 2, these investments are the intermediate mechanism that links the OFR with the productive performance of the NOC.

3.1.2. Use of oil revenues: Petrobras investments in the context of the Brazilian development strategy

Despite the semi-privatization of Petrobras, the government has always held the majority of the shares entitled to vote, allowing the State to maintain influence over the company's investment strategy to achieve functionality within the overall energy and industrial policy (Silva, 2010; Paz, 2014). A key indicator of this influence appears to be the company's investments, which have been undergoing some changes (see Table 2). The first changes came during the administration of President Cardoso, through intensification of the exploration invest-

(footnote continued)

included. There are basically two options: include only the specific production taxes (royalties, for example) or include also general taxes (tax profit, for example). See Agalliu (2011).

⁹ Whether or not the NOC shares in the government take (regardless of the other criteria mentioned in the previous note) is what largely explains the vast gap differing estimates for Brazil – Barma et al (2012) record 45%, while Agalliu records 72%.

¹⁰ Precisely for this reason, when we use the term government take, we do not include the share of income captured by the NOC.

¹¹ It should be clarified that the ownership of Petrobras is not entirely public. Until 2009, 54% of Petrobras shares were in private hands (42.5% of the shares entitled to vote). In 2009, as a result of the capitalization with BNDES resources, private shares fell to 40% (36% of the shares entitled to vote). The private ownership entails that part of the revenues captured by Petrobras be allocated to private investors through dividends. See: <http://www.investidorpetrobras.com.br/es/gobernacion/capital-social/>.

ment program to achieve self-sufficiency. Later, once the country had achieved energy self-sufficiency and following the pre-salt offshore oil discoveries, Petrobras adapted its strategy to the neodevelopmentalist policies of President Lula, characterized by (among other things) the promotion of refining and bio-fuels, or the attempt to revitalize local industry. To achieve the latter, the company intensified investments toward the industrialization of the O & G industry. In fact, between 2004 and 2009, investments in this area grew at an average rate of 46%, versus 11.8% between 1997 and 2003 (see Fig. 1). However, since 2010, a clear divergence has emerged between investments in E & P, whose share has increased very significantly (accounting for more than 65% of total investments), and any other type of investment, particularly refining, participation in which has undergone a drastic drop.

Investment data show that much of the oil revenue retained by the NOC is intended to feed continuation of the oil cycle, allowing (together with the technological capabilities of Petrobras) for the growth of production and reserves (see Fig. 2 and Table 3). This investment effort has been supported by the State through various mechanisms: the National Development Bank (BNDES), which in 2010 handled a total budget of nearly \$R170 billion, of which 15% (\$R25 billion) was allocated to the capitalization of Petrobras¹²; the *Programa de Mobilização da Indústria Nacional de Petróleo e Gás Natural*, or PROMINP, created in 2003 to increase the participation of local suppliers in the offshore chain; and the *Programa de Aceleração do Crescimento* (PAC), created in 2007, which proposed greater investments in infrastructure, particularly in the oil and gas sectors, mostly by Petrobras.

Despite the growth in the capital investment, production and reserves, the Brazilian model has not been free of contradictions related to the indirect control that the State has over O & G revenues through its influence over company strategy. These contradictions have strongly emerged following the sharp drop in oil prices.¹³ In this regard, two fundamental issues must be highlighted.

First, despite Petrobras' retention of much of the oil revenue, the ambitious investment program launched after the pre-salt discoveries has greatly increased the indebtedness of the company (Table 4), underlining one of the most vulnerable points of the model. That program responds to the State's efforts to reconcile the commercial objectives of the company and the national objectives of energy and industrial policy. The priority given to national objectives was reflected in the fact that investments in refining remained high for much of the period, meanwhile reducing resources to the upstream area, which is the more profitable in a context of high oil prices. Moreover, from the end of 2014, the drastic reduction experienced in international oil prices has added to Petrobras' internal problems associated with corruption scandals, also significantly altering the conditions of the 2000–2013 *status quo*, causing a drastic worsening of Petrobras' rating and increasing the costs of financing. This explains the 23% drop in Petrobras' total investments in 2014, although the fall in E & P investment was only 7.5%. This situation will worsen as long as oil prices continue to drop, as is happening with investments in E & P worldwide (IEA, 2016).

Second, measures aimed at generating backward linkages, an outstanding example of the industrialization role assigned to Petrobras, could result in increased costs for E & P, thus reducing the operating profit of the NOC. Indeed, as shown in Table 1, the cost rose every year between 2000 and 2013, most sharply after 2006. This increase has been influenced by the increasing involvement of offshore versus onshore E & P, but local content requirements also seem to have had a negative impact (difficult to estimate, as the Court of Auditors

¹² The Bank also has a program to support the O & G productive chain. As part of this program, it has funded the renovation of the fleet to service Petrobras (BNDES 2010, 102).

¹³ Note that the decline affects the company in two ways: first, through the decline in income, and second, through the deterioration of its reserves value.

Table 1

Brazil: State and Petrobras share in O & G incomes, 2000–2014.

Source: Authors' calculations based on Petrobras annual reports (lifting cost and investment), ANP (production and O & G prices), and Wulff (2011:28) (IR+CSLL+Dividends)

	2000	2002	2004	2006	2008	2010	2012	2014
Petrobras Oil production (Mb/year)	447,660	530,510	519,834	616,956	647,880	689,278	696,892	749,581
Oil price (US\$/b)	22	22	30	41	83	71	103	94
Oil incomes (US\$ millions)	9,790	11,432	15,834	25,067	54,070	48,921	71,452	70,339
Petrobras Gas production (Mboe/year)	81,304	95,490	102,468	107,707	131,392	137,537	156,031	180,804
Gas price (US\$/mil m ³)	80	68	104	164	311	272	219	229
Gas Incomes (US\$ millions)	1,064	1,063	1,726	2,869	6,643	6,088	5,545	6,741
O & G incomes (US\$ millions)	10,854	12,495	17,560	27,936	60,713	55,009	76,997	77,080
Lifting cost US\$/boe (1)	3	3	4	7	9	10	14	15
Lifting cost US\$/boe (2)	7	7	10	18	26	25	34	31
Other tax and contributions (US\$ millions)	1,645	1,704	2,842	6,288	10,147	8,273	2,310	nd
Petrobras operating profit (US\$ millions) (3)	9,267	10,617	15,207	23,168	53,506	46,724	65,157	63,529
Petrobras operating profit (US\$ millions) (4)	7,045	7,988	11,543	15,155	40,397	34,653	48,198	48,543
Petrobras operating profit (US\$ millions) (5)	5,400	6,283	8,701	8,867	30,251	26,379	45,889	nd
Government take (US\$ millions) (6)	2,222	2,629	3,664	8,013	13,109	12,071	16,958	14,986
Government take (US\$ millions) (7)	3,867	4,334	6,506	14,301	23,256	20,345	19,268	nd
Government take (6)/incomes	20%	21%	21%	29%	22%	22%	22%	19%
Government take (7)/incomes	36%	35%	37%	51%	38%	37%	25%	nd

(1) Without government take.

(2) With government take which includes: royalties, special shares, bonus and allocation, and area occupancy rate.

(3) Income-lifting cost without government take.

(4) Income-lifting cost with government take.

(5) Income-lifting cost with government take—other taxes and contributions except 2011–2014, which do not include the payment of dividends.

(6) Royalties, special shares, bonus and allocation, and area occupancy rate.

(7)=(6)+other taxes and contributions.

162,6 m³gas=1 boe.

concluded in a study published in 2016).¹⁴ According to Romano (2012) and De Oliveira (2010a), such requirements have driven industrial development, but there is great heterogeneity in the competitiveness of the different industrial branches. Local content requirements and the industrial policy that covers them have failed to achieve positive effects in those branches with the greatest potential competitiveness, as has occurred in the successful experiences of Norway and Singapore.

Ultimately, the analysis shows that the Brazilian OFR and the Petrobras investments are clearly representative of the developmental role assigned to the company by the State and the contradictory results this has affected. The increase in production and reserves has been accompanied by growing NOC indebtedness, unsustainable in a context of falling oil prices and further aggravated by corruption scandals. Despite the weaknesses shown by the company, a stronger commitment by the major oil companies was not evident in the 12th and 13th bidding rounds. Oil company decisions are clearly influenced by the fall in oil prices. In the last round, the 13th, only a relatively small percentage of the tendered areas were awarded. All of this opens uncertainties about the future of the sector – uncertainties which, moreover, could possibly extend to other oil-rich countries.

3.2. The Mexican oil fiscal regime

Pemex was formed after the nationalization of the sector by General Lázaro Cardenas in 1938, and for nearly four decades the NOC was aimed at supplying the energy resources that the Mexican economy needed. This function took place in the framework of an import substitution industrialization (ISI) phase turned toward the domestic market (as with Petrobras). During this period, the Mexican Petroleum Institute and the Federal Commission of Electricity were also formed; these organisms and Pemex constituted the elite of the agencies focused national development. All these agencies incorporated various economic and social achievements among their objectives (Stajanovski

et al., 2012), such as the construction of infrastructure, housing, and hospitals.¹⁵

In 1974, Pemex became an oil export company and was gradually oriented toward the external market, from which most of its income eventually derived. That change in Pemex was later fed by the discovery of the huge Cantarell field in 1976. Thus, Pemex became a powerful mechanism for generating revenue through oil exports – revenues that nourished Mexican state coffers. Meanwhile, Pemex operated with an infrequently renewed infrastructure and a minimum level of investment, the level allowed by the Mexico's Ministry of Finance and Public Credit (MFPC). Only in 2003 did the firm make its first foray into oil exploration since the 1970s, a difficult task since Cantarell had peaked and entered decline at the same time. The advent of the post-Cantarell period opened discussions about the reform of Pemex.

The difficulties faced by Pemex in securing increased investment and its weak ability to explore and exploit were used as justifications for the energy reform of 2008, an antecedent to the current. Indeed, since the 1970s Pemex has been the main supplier of revenue to the Mexican state (over 30% of total budget revenue, reaching 39% in 2006,¹⁶ but it has lacked the capacity to orient those revenues. This has resulted in increasing technical, operational, and financial difficulties, raising the possibility of opening the state monopoly to private capital. One very meaningful aspect must be highlighted: despite the great process of neoliberal reforms that took place under the presidency of Salinas de Gortari (1988–1994), during which Mexico signed into both the WTO and the NAFTA, Pemex continued as a state monopoly; that is, economic reforms inspired by the Washington Consensus, which represented an aggressive liberalization of the Mexican economy, had little impact on Pemex. Thus, the current energy reform can be seen as the culmination of the Washington Consensus agenda in Mexico, even

¹⁴ Although the study is not available, its main conclusions have been published in the media. See <https://www.portosenavios.com.br/noticias/ind-naval-e-offshore/34764-conteudo-local-prejudica-petrobras-diz-tcu>

¹⁵ "For the granting of medical services to its employees and their families, Petróleos Mexicanos has central hospitals, general hospitals, regional hospitals, satellite clinics, outpatient medical units, medical units in workplaces and offices in the Centers for Child Development (CENDI). In addition, as part of the support that Petróleos Mexicanos granted to its employees, PEMEX has CENDI and schools (Article 123), where the children of workers are taught." Pemex (2014:10).

¹⁶ Figures from MFPC.

Table 2
Petrobras: total investments, 2000–2014 (billions of current US\$ and percentage).
Source: Authors' calculations based on Petrobras annual reports and ANP

	2000	2002	2004	2006	2008	2010	2012	2014
Investment in E & P	2.9	2.9	4.3	7.0	14.3	18.6	21.9	24.2
Total investment	4.2	6.4	7.4	15.5	29.1	43.4	42.9	37.0
Investment in E & P/O & G incomes	26%	23%	25%	25%	24%	34%	29%	31%
Total investments/O & G incomes	38%	52%	42%	55%	48%	79%	56%	48%

Petrobras: investments by sector, 1999–2014 (percentage of total)

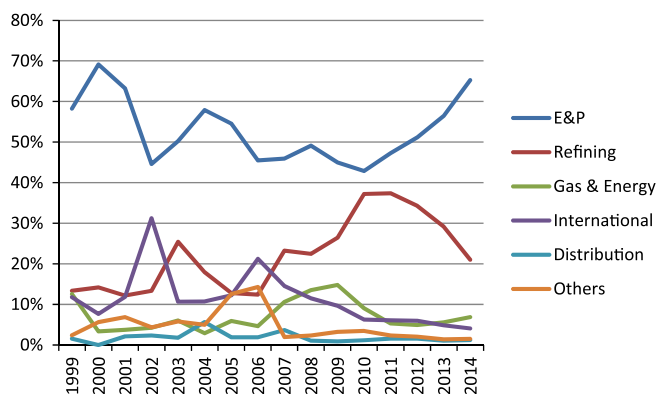


Fig. 1. Petrobras: investments by sector, 1999–2014 (percentage of total). Source: Petrobras annual reports.

as, all across the hemisphere, the concept of post-neoliberalism continues to be discussed and reflected upon (Berrios et al., 2010; Dubash and Morgan, 2012; Grugel and Ruggirozzi, 2012).

Based on the reflections enumerated in Section 2, we now turn to those aspects of Mexican OFR that affect the appropriation and use of oil revenues. In particular, Mexico represents a case of co-optation by the State of the revenue generated by the company for use outside the company, which qualifies Mexico as being a rentier state. Here we seek to discover the extent to which Pemex's role as a supplier of revenues to the state budget works against the company's own interests and/or against Pemex's intention of becoming a major actor with a development role similar to that of Petrobras in Brazil. In that regard Pemex (and the OFR into which it is incorporated) are very different from the case of Brazil and Petrobras, and these distinctions are defining aspects of the development style in Mexico.

3.2.1. Fiscal regime and distribution of oil revenues

Pemex is part of the Mexican government apparatus, into which it appears to be subordinately embedded. The institutional framework within which Pemex is integrated ensures that its operation be subject to the guidelines and requirements of the State. Indeed, the federal government oversees Pemex and has the power to set the company's strategy. Unified control made it easier for the government to set and administer this strategy using a variety of mechanisms, including control over budgeting and regulation. Pemex remains 100 per cent State-owned, and the idea of even partially privatizing Pemex remains tremendously unpopular with the Mexican public (Stajanovski, 2012).

Although the company's broad lines of action are established by the President of the Republic and the Congress, the most direct influence over Pemex comes from several ministries in Mexico's vast bureaucracy, each pursuing many goals and, at times, operating in conflict.

Brazil: oil production, 1998–2014

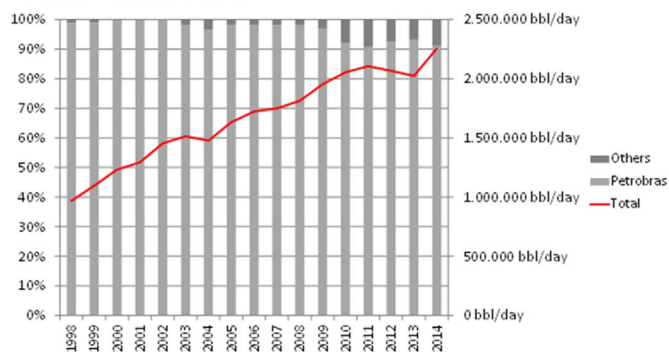


Fig. 2. Brazil: oil production, 1998–2014. Source: Authors' calculations based on data from ANP.

For example the energy ministry monitored all Pemex activities and proposals even while the minister himself was Chairman of the Board. The finance ministry is in charge of incorporating Pemex's budget and usually occupies a seat on the Pemex board. The MFPC, in effect, controls all the levers that affect the company's finances. It sets the prices that Pemex charges domestically, proposes the taxes Pemex will pay, and decides on the Pemex budget to be submitted for congressional approval. Overall, MFPC provides strict financial oversight of the company; but it does not provide strategic and technical oversight. Therefore, the priority of the ministry lies in whether Pemex will conform to the demands of the budget. We believe that this priority has hindered the impulse of strategic decisions regarding the technology used, or the establishment of a coherent plan for long-term growth.

What is the OFR within which Pemex operates? It should be noted that until 2005, Pemex's budget was incorporated into the general budget of the Mexican State for each fiscal year, according to the Revenue Act of the Federation. Since that year, however, Pemex has had a special budget, separate from the general state budget. Currently there are three ways in which Pemex and its subsidiary organisms¹⁷ comply with their tax obligations: 1) by paying duties (upstream), 11 in total; 2) through the payment of taxes (downstream), 4 in total; and 3) through other contributions, including:

1. Ordinary Hydrocarbons Duty (DOSH)
2. Hydrocarbons Duty for the Stabilization Fund (DSHF)
3. Special Hydrocarbons Duty (DESH)
4. Royalty on Extraction of Hydrocarbons (DSEH)
5. Rights for Scientific and Technological Research on Energy (DEIME)
6. Duty for Oil Control (DEFIPE)
7. Additional Hydrocarbons Duty (DASH)
8. Extraordinary Duty on Oil Export (DESEP)
9. Duty to Regulate and Supervise the Exploration and Exploitation of Hydrocarbons (DRSEEH)
10. Tax Revenue from Oil
11. Special Tax on Production and Services
12. Added Tax
13. Foreign Trade Tax

Of all these duties and taxes, the most important are the DOSH and the DSHF. The DOSH aims to move the oil revenue to the treasury and applies entirely to Pemex's Exploration and Production. The DOSH taxes the extraction of O & G with 71.5% of the total value of output less the deductions applicable by law.¹⁸ Mexican tax law requires Pemex to

¹⁷ These being Pemex Exploración y Producción, Pemex Corporativo, Pemex Refinación, Pemex Gas y Petroquímica Básica, Pemex Petroquímica, and Pemex Comercio Internacional.

¹⁸ These deductions are equivalent to 100% of the exploration expenditure, 16% of the

Table 3

Brazil: O & G proven reserves, 1998–2014.
Source: ANP

	1998	2000	2002	2004	2006	2008	2010	2012	2013	2014
Gas (millions m ³)			244,547	326,084	347,903	364,236	423,003	459,187	457,960	471,095
Petróleo (MMbl)	7,357	8,465	9,805	11,243	12,182	12,801	14,246	15,314	15,544	16,184

Table 4

Petrobras Leverage (millions of current R\$), 2006–2014.
Source: Petrobras. Data available online at:

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Net Debt	18,776	26,67	48,824	71,863	61,007	103,022	147,817	221,563	282,089
Net Capitalization	116,307	140,524	187,189	240,311	399,106	452,031	514,119	570,897	592,811
Net Debt/Net Capitalization %	16	19	26	30	16	24	28	39	48
Short-term Debt / Total Debt %	28	23	21	15	13	12	7	7	9

<http://www.investidorpetrobras.com.br/en/debt/indebtedness-and-leverage>

make deliveries to the treasury on a daily and weekly basis.¹⁹

Meanwhile, the DSHF must be paid by Pemex Exploration and Production as long as the weighted average price of a barrel of oil is above US\$22. The tax rate applied varies between 1% and 10%, as prices evolve between US\$22 and US\$31. Because the price in recent years has remained consistently above US\$31, the applied rate has remained at 10%.

With these tax rates, the DOSH makes up 85% of payments by Pemex to the Mexican State, and DSHF 11%, so that both together represent 96% of Pemex's tax burden, according to 2012 data.²⁰ This charge does not allow Pemex to dispose autonomously of income that it generates, because these payments to the State involve the transfer of almost all its benefits. That is the mechanism through which the Mexican government enjoys access to oil revenues.

The evolution of the income of Pemex, its profit margin (before taxes), and payments made to the State are given below.

Tables 5–7 show that practically all the profits generated by Pemex are used to pay taxes and duties, revealing the chief role of Pemex as a revenue-supplying entity for the Mexican state. Indeed, that flow of payments to the State – higher than the company's own profit margin in many years – escapes from company management and use for the productive or commercial functions of Pemex.

Therefore, what we have is a fiscal regime conceived to channel virtually all oil revenues to the State, which results in the high weighting of Pemex payments in terms of overall state revenues. These two mutually reinforcing aspects reveal the rentier character of the Mexican state and the instrumental role that Pemex is required to play. All this will have consequences for the behavior of the company itself, especially in its investment performance.

This situation, among other aspects, helps to explain the energy reform approved in December 2013. Pemex's role as a revenue-supplying entity for the Mexican state prevents its autonomy in the management and use of hydrocarbon revenues. It is the Mexican state that establishes how those revenues are to be used. Thus, the budgetary needs of the State permanently relegate investment priorities.

The aims for energy reform are clear: the government seeks private

(footnote continued)

costs of developing and operating fields, and the 5% of the expenditure on pipelines, transportation, and storage of oil.

¹⁹ In particular, Article 7 of the Law of Federal Revenue for Fiscal Year 2013 provides: "A cuenta del derecho ordinario sobre hidrocarburos (...), PEMEX Exploración y Producción deberá realizar pagos diarios, incluyendo los días inhábiles, por 634 millones 525mil [sic] pesos durante el año. Además, el primer día hábil de cada semana del ejercicio fiscal deberá efectuar un pago de 4mil 453 millones 880mil [sic] pesos". Original in Spanish.

²⁰ Data online at <http://www.hacienda.gob.mx>.

investment to boost oil and gas exploration and production. In particular, the government hopes that private investors will assist the state-owned petroleum company Pemex in exploiting future fields, especially as regards Mexico's promising shale oil and gas fields and its deep-water oil resources. Furthermore, Pemex is to become a "state-owned productive company" with greater independence from the Mexican government, which will nevertheless retain a degree of control over Pemex's operations. Therefore, the reform introduces two important new features: firstly, it will allow the participation of private companies through exploration and exploitation contracts; and secondly, Pemex will convert into a productive enterprise with greater autonomy. With these two new features, Mexican state expects to recover the production capacity lost in recent years while demonstrating official mistrust that Pemex can act successfully alone. The Cantarell field is exhausted, and new fields will prove more difficult to exploit, either because they are located in deep or ultra-deep water, or in shale rock (requiring fracking techniques), or else because they are mature fields where oil reserves are under lower pressure and more resistant to extraction. All these fields require a technical and financial capacity that Pemex currently lacks (Alvarez and Fabián, 2015).

To establish the participation of private companies, the following types of contracts have been made available (Adrian Lajous, 2014):

Service contracts: contractors deliver all production to the government in exchange for a cash payment established in the contract.

Profit-sharing/Production-sharing contracts: contractors recover their costs and keep a percentage of production or profits. In exchange, contractors must pay certain exploratory-phase fees and royalties.

License contracts: while reserves in the ground remain State property, contractors receive the hydrocarbons in-kind at the wellhead, in exchange for some cash payments (including exploratory-phase fees, royalties, and a percentage of the operating profits).

These contracts will be granted only to Mexican companies. Therefore, foreign investors must incorporate Mexican entities in order to channel their investments. The reform also sets out that contractors will be required to procure a percentage of their goods and services from Mexican providers (with the minimum percentage to increase gradually, from 25% in 2015 to 35% in 2025).²¹

However, many doubts remain about the power of this energy reform to truly change the position and role of Pemex, because the

²¹ In July 2015, the first bidding round was decided. The results were disappointing, since only two contracts (out of a planned 14) were assigned for the exploration and exploitation of oil in the south of the Gulf of Mexico. These two contracts were won by a consortium formed by the private Mexican company Sierra Oil & Gas along with Energy Talos (U.S.) and Premier Oil (United Kingdom). Undoubtedly, the situation of the global oil market, characterized by falling prices, has harmed Mexican interests.

Table 5

Pemex: income, 2001–2014 (billions of current US\$).

Source: Authors' elaboration, using data from Pemex (2013) and Pemex (2015)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2104
Domestic market	16	16	21	29	39	47	50	48	44	55	56	57	62	64
Export	33	31	35	40	47	50	55	50	36	48	55	52	49	43
Total	49	47	56	69	86	97	105	98	80	103	111	109	111	107

Table 6

Pemex: profit margin before taxes, 2004–2014 (billions of current Mexican pesos).

Source: Pemex (2015)

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
459.3	506.1	628.1	658.9	659.6	452.0	607.6	767.7	905.2	694.8	480.5 ^a

^a 32.6 billions of US\$.**Table 7**

Pemex: payments by the company to the State in duties and taxes, 2004–2014 (billions of current Mexican pesos and percentage).

Source: Pemex (2015)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Billion of current Mexican pesos	474.3	580.6	582.9	677.3	771.7	546.6	654.1	874.6	902.6	864.9	746.1 ^a
payments/incomes	60.9	62.8	55.7	59.1	58.2	50.0	51.5	56.1	63.3	64.1	47.4

^a 50.7 billions of US\$.

reform does not establish a new oil regime. We believe that in the Mexican case, a change of fiscal regime is the most significant challenge, rather than the establishment of new conditions for the participation of private companies (Lajous, 2014). The results of the participation of private companies will depend on the type of contract that they sign and their subsequent compliance (to be analyzed in coming years). So long as a comprehensive reform of the Mexican *hacienda*, or tax system, is not effected, Pemex will remain the main source of income for the Mexican state and will fail to achieve its operational objectives.

3.2.2. Use of oil revenues

Having clarified the criteria for allocation of oil revenues, largely monopolized by the State, we will examine the use made of it. Specifically, we are interested in this revenue's relationship with Pemex investments. As we have seen, the tax treatment of Pemex is the mechanism by which the State accesses control of oil revenues. This means that the tax burden on Pemex's income is very high, peaking in 2013 (at 64.1%, see Table 7, or well above that of Petrobras in Brazil, which accounts for just 25% (Table 1). Pemex's tax burden has hindered its ability to respond to changes in the international markets. In effect, the sharp drop in oil prices that began in the second half of 2014 has reduced export income (although a bigger drop in revenue is still expected in the years to come). As shown in Table 6, the profits registered before taxes fell by more than 30% in 2014. When the tax burden is also considered, the result after taxes fell from –170.1 billion to –256.6 billion Mexican pesos – the largest losses in Pemex's history.

Undoubtedly, Pemex is in a worse position than other oil companies in terms of mounting ambitious investment strategies. Indeed, despite having obtained substantial resources derived from its total sales, with revenue doubling between 2001 and 2014²² (Table 5), Pemex's productive investment has been insufficient to face the energy challenges of the country. Next we look at the evolution of that investment as a percentage of income, and the allocation of investment among various destinations.

As shown in Table 8, the investment during the period has

represented a growing percentage of revenues. Although the sub-period 2009–2014 exceeded 20% on average, it is far from the 65.8% annual average registered by Petrobras for the same period (Table 1). Even if it meets the forecasts of its 2013–2017 business plan, which speaks of reaching a level of 25% (Pemex, 2013), Pemex would be far behind Petrobras in this respect. In any case, this upward trend reflects the interest of Pemex in stabilizing its declining production, reducing the rate of decline of the main fields, and increasing the level of reserves, as has been recognized by the oil company itself (Pemex, 2013). Regarding the higher investment during the period analyzed, the introduction in 1997 of Pidiregas had great importance. Pidiregas was an instrument for public investments, but resorting to private financing. The growing investment was therefore financed by indebtedness, coming to represent 39% of Pemex's total investment in 1998 (the first year in which the Pidiregas mechanism was used) and 88% in 2008 (the final year of Pidiregas) (Stajanovski, 2012).²³

The orientation of investments (Fig. 3) shows its concentration in E & P, especially exploitation, with a percentage close to 90%. The reality shown by Fig. 3 is evidence of Pemex as a company increasingly focused on upstream activities, with only residual investment efforts in downstream activities or industrial development. In other words, Pemex has given priority to oil and gas production (exploitation of fields) to increase oil revenues (State-oriented) over other strategies such as energy self-sufficiency (refining potential) or productive diversification (petrochemical priority).

The most crucial element in understanding the investment behavior of Pemex is its role within the Mexican *Hacienda*, or revenue system. This role is so important that it causes Pemex to distort its own performance as a company. This will have implications for the declining trend in production and, above all, in reserves (see Figs. 4 and 5).

In both cases, despite the investment priority to E&P, both production and reserves (proven reserves, mostly) have not stemmed their decline in recent years. This mounting weakness of Mexico in

²³ The acronym Pidiregas translates as "long-term budget deferred infrastructure projects" which are, at their core, entirely debt-financed; and its extended use by the State was not exempt from polemics and critiques.

²² Despite suffering heavy oscillations.

Table 8
 Pemex: total investments, 2002–2014 (billions of current US\$ and percentage).
 Source: Authors' elaboration, using data from Pemex (2013) and Pemex (2015)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total investments	8	10	10	11	13	15	18	19	21	22	24	22	24
Investments/incomes	17.0	17.9	14.5	12.8	13.4	14.3	18.4	23.8	20.4	19.8	20.7	20.2	22.4

Pemex: investments by sector, 2001–2014 (percentage of total)

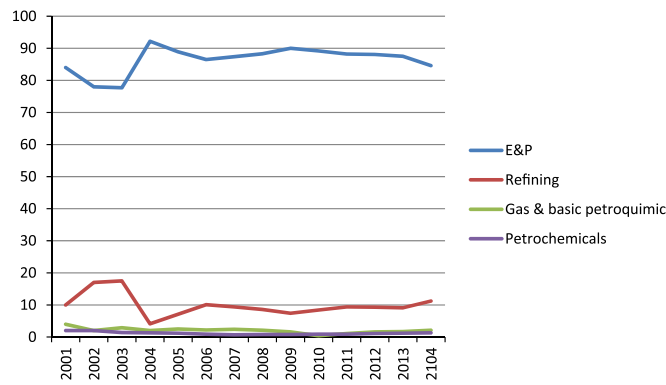


Fig. 3. Pemex: investments by sector, 2001–2014 (percentage of total). Source: Pemex Statistical Yearbook 2012 and Pemex (2015).

Pemex: O&G production, 2002–2014 (thousands of barrels of oil equivalent produced daily)

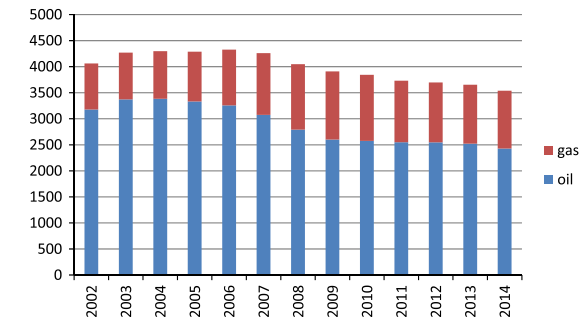


Fig. 4. Pemex: O&G production, 2002–2014 (thousands of barrels of oil equivalent produced daily). Source: Authors' elaboration, using data from Pemex (2015).

México: O&G total reserves, 2002–2014 (billions barrels of oil equivalent)

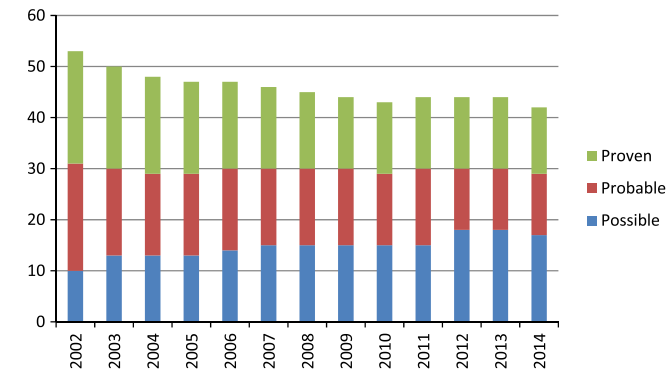


Fig. 5. México: O&G total reserves, 2002–2014 (billions barrels of oil equivalent). Source: Pemex (2015).

terms of production and especially reserves was a key argument that helped promote the energy reforms of 2008 and 2013. As mentioned, investment demands have increased in recent years, especially since the Cantarell oil field reached its peak. For the better part of three decades, Pemex was able to rely on plentiful, easily accessible crude oil flowing from the Cantarell oil field, long the second-largest productive field in the world and the primary reason behind Mexico's successful transformation into a major oil exporter.²⁴ Cantarell's production peaked in 2003–2004, when it represented 60% of Pemex's total production. In the years since, Pemex has not been able to forestall the field's decline, and productivity has dramatically decreased, forcing the company to face a potential crisis of reserves and production. It is very probable that Mexico still has huge hydrocarbon resources under the deep waters of the Gulf of Mexico. But these kinds of fields have yet to be carefully explored, let alone developed, because Pemex lacks the necessary deep-water technology to access them. And this challenge makes the need for investment even greater.

Pemex's analysis reveals some crucial aspects of their performance that allow us to better understand the downward trend of their productive potential and the size of their reserves. The information available and most publicized studies reveal Pemex as captive to Mexico's *Hacienda*, as a "collector" instrument that has benefited from the evolution of prices, allowing the company to compensate for the weakness of production. The "collector" character of Pemex erodes its performance as an oil company, affecting the development of reserves and production thanks to investment weakness. This, therefore, is the function of Pemex in terms of Mexico's development style, the aspect from which the oil situation in Mexico must be addressed. The (rentier) State needs Pemex to obtain revenues, and this goal takes priority over all other energy or industrial targets. Only with the release of Pemex from its "collector" function can other goals be addressed. Any strategy for revitalizing Pemex would require advance fiscal reform to reduce dependence of the State on company revenues. The tax treatment of Pemex needs to be based on the concept of a "public company with productive character", as was established by the Pact for Mexico.²⁵ This important aspect implies a tax rate on profits that would allow Pemex to reinvest in productive projects targeting not only the extraction of crude oil (both conventional and unconventional – deep water, shale gas, or shale oil), but also in projects to develop petroleum and petrochemical processing, infrastructure for distribution, transport and storage, and research and development. Therefore, such a fiscal change would be a necessary condition for attaining the full modernization of Pemex. So long as the fiscal equation does not change, conditions will not allow Pemex to actually become a "public company with productive nature", in order to make the sector an "engine of economic growth through attracting investment, technology, and training value chain", as is established by paragraph 2.5 of the Pact for Mexico.

Finally, after analyzing the cases of Petrobras and Pemex, we directly compare the most important indicators of both companies to

²⁴ This largely served to reinforce the State's financial dependence on Pemex and to discourage investment in exploration, infrastructure, and new technologies for other producing fields (Stajanovski, 2012).

²⁵ The Pact for Mexico (December 2012) is a document signed by the President of Mexico and the three major political parties (PRI, PAN, and PRD) in which are established 95 general commitments to promote the economic, social, and political modernization of the country.

provide more support for the following conclusions.

	Brazil (Petrobras)	Mexico (Pemex)
Government take/incomes	Government take represents between 25% and 50% of revenues, albeit with a clear declining trend in recent years.	Government take is the majority share of the incomes, between 50% and 65%. Stable trend throughout the period but with uncertainty due to deterioration in the performance of the company from 2014.
Total investment/incomes	Investment represents a high percentage of revenue, consistently over 50% with peaks of 80%. This trend continues throughout the period, although with variations.	Investment represents a very low percentage of revenue, remaining under 20% during the period, albeit with a slight increase in recent years.
Evolution of proven reserves (2002–2014)	193% increase in proven reserves of gas 165% increase in proven reserves of oil	41% drop in the proven reserves of oil and gas

Source: Tables 1–3, 5, 8, and Fig. 5.

4. Conclusions and policy implications

The analysis of how OFR affects the E & P activities of Petrobras and Pemex in the O & G industry allows us to reach four conclusions consistent with the findings mentioned in section two:

First, analysis of the OFR should include both the direct and indirect mechanisms of revenue capture by the NOC and the development strategy, which strongly affects the use of those revenues. Although the emphasis of certain institutional reforms is set only in the direct mechanisms, the indirect mechanisms can be more crucial to the performance of the NOC and industry.

Second, we have found that the differences between the Brazilian and Mexican OFRs come as a result of the different roles assigned to the respective NOCs in the development strategy. In this sense, the role of the NOC is consistent with the role of the State in either development strategy. Again, this shows that, although the emphasis of certain reforms is to modify the ownership structure of the industry, this cannot be a decisive factor in improving NOC performance.

Third, the analysis shows that, as pointed out by the NOC literature, while the achievement of “national” and “commercial” objectives will determine the performance of an NOC, these objectives need not be incompatible, or in a situation of permanent subordination of one to the other. As demonstrated by the Petrobras case study, it is possible to achieve an interdependent relationship between both objectives, but only in a scenario of high oil prices. Undoubtedly, periods of high prices guarantee profitability thresholds that facilitate both objectives, but do not necessarily strengthen the NOC. Moreover, the Brazilian model is far from “ideal” and suffers its own contradictions. The model is based on the significant participation of Petrobras in E & P activities, which require the very high investments that triggered the company’s growing debt. This has generated a debate around what would be the most appropriate orientation of Petrobras investments. In fact, some refining projects have progressed very slowly in recent years. In addition, local content measures have raised lifting costs, and the company’s shares

have experienced a devaluation interpreted by some analysts as an expression of the limits of the model. In addition, since the end of our period of study, these limitations have been compounded by corruption and other factors external to the OFR, such as falling oil prices. Nevertheless, these changes in circumstances do not entirely invalidate the viability of the Brazilian OFR or the lessons that can be drawn from it.

Fourth, the case of Mexico evidences how the prevalence of “national objectives” (in this case tax collection) hampers the potential of the NOC. This situation is not being challenged in the current energy reform, casting doubt on the likelihood that Pemex will become a productive, innovative, and dynamic company able to stimulate the productive transformation of Mexico, as stated in the Pact. Two objectives of the Mexican state – that Pemex will continue as a productive enterprise and contribute as before to the public budget – are highly incompatible.

We must also recognize certain limitations of our work, derived from the parameters of the article extension: i) First, the analysis has focused on the later development stage of both companies, but, a longer-term perspective would be useful for understanding the development of technological capabilities by Petrobras (key to its current exploration success) as well as the reasons for Pemex moving to a rentier role some decades ago; ii) In addition, there are other variables to explain the differences between Brazil and Mexico that are barely considered in this work, including such critical issues as the international context, especially in oil prices, the origins of the NOC as an oil exporter or importer, and the geographical locations of O & G reserves. Undoubtedly, these factors have also influenced the role assigned to both companies in the development strategies of their countries, as well as the OFR that has conditioned its performance.

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