



THE RULE OF LAW AND MEXICO'S ENERGY REFORM

**The Rule of Law and Foreign Investment in Oil:
Petroleum Nationalism in Latin America and Its Implications for Mexico**

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Prepared for the study, “The Rule of Law and Mexico’s Energy Reform/Estado de Derecho y Reforma Energética en México,” directed by the Baker Institute Mexico Center at Rice University and the Center for U.S. and Mexican Law at the University of Houston Law Center, in association with the School of Government and Public Transformation at the Instituto Tecnológico y de Estudios Superiores de Monterrey, the Centro de Investigación para el Desarrollo A.C. (CIDAC), and the Faculty of Law and Criminology at the Universidad Autónoma de Nuevo León.

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Study Acknowledgements

A project of this magnitude and complexity is by necessity the product of many people, some visible and others invisible. We would like to thank Stephen P. Zamora of the University of Houston Law Center and Erika de la Garza of the Baker Institute Latin America Initiative in helping to conceive this project from the start. We would also like to acknowledge the support received from Luis Rubio and Verónica Baz of the Centro de Investigación para el Desarrollo A.C. (CIDAC); Pablo de la Peña and Alejandro Poiré of the Instituto Tecnológico y de Estudios Superiores de Monterrey; and Oscar Lugo Serrato and Manuel Acuña of the Law School at Universidad Autónoma de Nuevo León. The collaboration between our institutions and the material and moral support were key to this project's success.

We would also like to acknowledge the logistical support and project coordination provided by Lisa Guáqueta at the Mexico Center, as well as the efforts of all of the authors that participated in this study and the many silent hands that helped put together workshops, events, and meetings related to this project. We also thank the peer reviewers, editors, style correctors, and translators, and Tirant lo Blanch.

This study is dedicated to Stephen P. Zamora, our friend and colleague and one of the driving forces behind this project, who passed away before the completion of this study.

About the Study: The Rule of Law and Mexico's Energy Reform/*Estado de Derecho y Reforma Energética en México*

The 2013 changes to the constitutional framework and the summer 2014 enabling legislation in Mexico's energy industry represent a thorough break with the prevailing national narrative as well as the political and legal traditions of twentieth century Mexico. Mexico is about to embark on an unprecedented opening of its energy sector in the midst of important unknown factors, as well as a fiercely competitive and expanding international energy market. Mexico is one of the last developing countries to open its energy sector to foreign investment, and although there are important lessons that can be learned from other countries' experiences, this does not imply that the opening will be necessarily as successful as the government promises or that the implementation of the new laws will go smoothly. Almost certainly, after the enabling legislation goes into effect, important questions of law will emerge during the implementation, and unavoidably, refinements to the legislation will have to take place.

The book "*Estado de Derecho y Reforma Energética en México*," published in México by Tirant lo Blanch and written in Spanish, is the culmination of a major research effort to examine rule of law issues arising under the energy reform in Mexico by drawing on scholars and experts from American and Mexican institutions in order to bring attention to the different component parts of the new Mexican energy sector from a legal standpoint.

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Introduction

The development of the petroleum sector has been characterized by a succession of cycles of investment and expropriation (i.e., forced renegotiation of contracts, nationalization, changes in fiscal rules, etc.). These cycles have been particularly pronounced in Latin America, although other regions and even developed countries have also experienced this phenomenon. This essay intends to provide elements for understanding why these cycles occur in light of the regional experience and to derive lessons to be considered during the implementation of the petroleum reform in Mexico.

The fiscal and contractual framework for the exploitation of petroleum resources in Latin America has undergone important changes over the course of the past decades. During the 1990s, the hydrocarbons sector of the region was opened up to private investment and the fiscal and contractual frameworks were made more flexible to attract foreign investment; during the first decade of the 21st century, the significant increase in the price of oil generated great political and social pressures to increase the government-take and exercise more state control. This trend materialized strongly in countries such as Argentina, Bolivia, Ecuador, Venezuela, and, more recently and with less intensity, Brazil, although in one way or another, it had an impact in all productive countries. Expropriation, forced renegotiation of contracts, and other regulatory changes that negatively affected foreign investors had significant effects in terms of reputation, which contributed to the fact that the region did not take advantage of high oil prices in order to increase investment and production, with the significant exceptions of Brazil and Colombia. Considered as a whole, Latin America produced slightly less in 2013 than when the price boom started in 2003.¹ Latin America lost one percentage point of the worldwide market share and now has the lowest rate of extraction among regions in the world.²

The specific characteristics of the sector—among them the presence of significant revenue, a high proportion of sunken costs, and changes in the risk profile of projects—contribute to making it particularly vulnerable to expropriation cycles. Petroleum nationalism, and its absence, have not only been motivated by the ideological preferences of the governments of the region, but rather to a great degree have been the result of the incentives generated by geological characteristics, investment and price cycles, and other structural and institutional variables.

The same country has had different policies depending on the type of resource, and even the policies of a given administration have been different whenever circumstances have changed. One of the basic variables has been the amount of revenue present at a given time; therefore, the international price of oil is a key element. Significant price increases tend to generate significant incentives for the renegotiation of contracts and fiscal conditions as well as for expropriation or nationalization. The end of a significant investment cycle, when significant projects that incorporate production and reserves are completed, also generates incentives for changing the rules.

Another relevant variable is the progressiveness of the fiscal and contractual framework; that is, to what extent the government-take automatically rises in response to an increase in revenue, particularly one generated through price increases. Fiscal and contractual frameworks that are barely progressive or are even regressive, such as those that have characterized the region, have caused states to have powerful incentives to raise the tax burden or to expropriate during periods of significant price increases. In general, the fiscal frameworks of petroleum resources have been unsophisticated and have not incorporated significant contingencies in terms of price and profitability. The lack of adaptability and progressiveness of the fiscal and contractual frameworks has contributed to creating cycles of tax structures that are more flexible or stringent.³

The lack of institutional capacity and credibility of certain countries makes their fiscal and contractual frameworks unreliable for investors. This may cause those countries to adopt rigid rules or instruments that are not suitable for changes in profitability; use international mechanisms of commitment, such as arbitration or investment treaties, thereby losing sovereignty and flexibility; or offer very high yields at the start of the projects to compensate for high regulatory risks. It could also result in less investment in the sector than what it could have been obtained with a more solid institutional framework. If lack of credibility is the reason for offering very attractive conditions in order to attract investors, such conditions would tend to be more prone to renegotiation. This problem of “time inconsistency” is one of the reasons why the stability of the tax and contractual framework is precarious and leads to the cycles of investment and expropriation that have characterized petroleum resources in the region and a great part of the world.

The Mexican petroleum reform has the advantage of being able to apply lessons learned from the experience accumulated over the past two decades in the region. Among these lessons, the following are noteworthy: 1) there are significant risks of reversing reforms; 2) the failure of reforms to attract investment and increase production can be a reason for their reversal, but significant success in terms of reserves and production can also exert pressure to renege on contracts; 3) significant changes in the international price of oil can generate incentives for renegotiation as long as contracts do not properly cover such contingencies, and sometimes even when they do; and 4) the credibility of the regulatory framework is an essential condition for maximizing the benefits of the petroleum sector, since regulatory insecurity leads to either less investment or a smaller share of profits for the state.

The Political Economy of the Petroleum Industry

An analysis of the political economy of the petroleum industry must take into account the interaction between the following factors: 1) the very characteristics of the sector that distinguish it from other industries; 2) the available resources of the country, such as geological potential, available reserves, and the status of the country as a net importer or exporter; 3) the characteristics of the institutional and contractual framework, including the fiscal system; and 4) economic factors—first and foremost, price cycles, and also the stage of the investment cycle in the country and the risk level of projects, technological change,

and the government's dependence on petroleum revenue. An analysis of these factors is necessary in order to assess the impact of the fiscal and contractual framework on the performance of the sector.

Characteristics of the Petroleum Sector

The hydrocarbons sector has the following characteristics: 1) very significant economic rents are generated through the extraction of oil and to a lesser degree through the extraction of natural gas; 2) a high proportion of sunken costs (immobilized investments) is required in comparison with operating and non-sunken costs; 3) most of the reserves and investment opportunities are located in countries that are institutionally weak and subject to high political risks; 4) there is significant variation in terms of risk during the different stages of investment in the sector: while oil exploration involves high geological risk, these risks decrease considerably during the development and extraction stages; 5) the products, gas or oil derivatives such as gasoline, are consumed widely by the population and represent a significant portion of their basket of consumer goods; 6) the price of oil (and that of gas, to some degree) on the international market is volatile, and therefore, revenue obtained from oil is also volatile; and 7) the revenue generated is relatively easy for governments to appropriate (Monaldi 2010; Manzano and Monaldi 2008). These traits have very important implications for the development of the fiscal framework of the sector as well as for conflicts between governments, companies, and consumers.

Unlike other industries, petroleum exploitation and, to a lesser degree, gas exploitation creates significant rents. These revenues are generally defined as the profit exceeding the opportunity cost of reproducible production factors (labor and capital).⁴ For example, in the case of Latin America, the cost of oil extraction typically varies between USD 4 and USD 15 per barrel. Based on these costs, the boom in prices to levels above USD 100 per barrel during the past decade generated exorbitant rents. However, when the oil price dropped below USD 10 in 1998, rents were much lower, and some deposits were producing without generating any rents or even operating at a loss.

In theory, rents can be easily collected by the government without affecting long-term production. For this purpose, governments can use tools inherently related to their sovereign control over taxes and regulations as well as their property rights over the subsoil. As long as a producer covers its costs and obtains a return that sufficiently compensates for the risk, the collection of rents by the state should not provide any obstacle to the development of the potential of the sector. On some occasions, however, oil companies withhold a significant part of these rents, whereas in others, states over-extract resources and/or expropriate investors by not permitting them to recover the investment at an attractive rate of return. In the first scenario, the state and its citizens lose financial income that may be significant without any economic justification. In the second scenario, incentives for long-term investment are harmed, and the development of the potential of the sector is affected.

This inability to efficiently capture the rents generated through the exploitation of hydrocarbons is partly due to rigid contractual arrangements and the lack of progressiveness of the fiscal systems, under which the government obtains an increase in the collection of taxes that is less than proportional to the increase in international price. This means that, in view of significant increases in the international oil price, governments have incentives to renege on their commitments assumed during periods with lower price levels. On the other hand, during periods of low prices, the institutional and fiscal frameworks generally make investment hardly attractive.

The petroleum and gas industry is also characterized by the presence of high sunken costs, assets that due to their very nature are immobilized before companies start recovering their investment.⁵ As soon as these assets are tied up, their *ex post* value for alternative uses is very low, which opens the door for appropriation by the government. The state can forcibly increase its share of revenue and companies would continue to have incentives to continue operating to the extent that they recover operating costs (which are proportionally less).⁶ As soon as most of the immobilized investment has been made, governments will have incentives to expropriate by changing the terms of investment, whether by tax increases, regulatory changes, or by unilaterally fixing prices on the domestic market to levels below opportunity cost—for example, the price of gasoline or gas.⁷ The political benefits of renegeing on commitments are high. Over the short term, the government can extract abundant fiscal resources or transfer them to consumers via artificially low prices without causing any significant impact on production. This logic applies even in the case of state-owned companies.⁸

The exploration and production of oil is particularly risky from a political and regulatory point of view because most of the reserves throughout the world are concentrated in developing countries with weak institutions and are subject to high political risks. The governments of these countries have difficulties convincing investors of their capacity to commit to and comply with signed agreements in a manner in which private investors, as well as state companies, can recover their sunken costs. If the political benefits that can be obtained from renegeing on agreements are high and the short-term costs of doing so are low, then only the presence of strong domestic institutions or external mechanisms capable of enforcing compliance can ensure the credibility of property rights (Manzano and Monaldi 2008).⁹

The geological and economic risk varies significantly among petroleum projects. Depending on the level of these risks and the magnitude of investment in the projects, governments will be either more or less willing to invite multinational companies and offer attractive conditions for investment (Nolan and Thurber 2010). The existence of high geological risks during oil exploration provides incentives for governments to offer attractive conditions for investors at this stage. However, once exploration is successful, governments start to have incentives for renegotiating the initial conditions.¹⁰

State-owned companies tend to favor stages and projects with less risk, such as in areas that have already been developed and are mature. The basic reason for this is that state companies have less capacity to handle large high-risk projects; unlike multinational companies, they tend to have their reserves concentrated in a single geographic area and are therefore less diversified. Likewise, a state as a shareholder tends to be more averse to assuming very high risks and does not offer incentives for the state manager to assume such risks (Nolan and Thurber 2010).

In turn, for projects on the technological frontier or in areas with a higher geological risk, large-scale multinational companies tend to be better positioned in the exploration of new oil provinces, in areas with difficult access (deep-water), or in the performance of non-conventional crude oil projects (bitumen or shale).¹¹

The volatility of international oil prices means high revenue volatility. The fiscal systems of the countries in the region have had difficulty in collecting all the rents that are generated under different price scenarios, and price volatility is therefore particularly problematic. In the case of countries that depend on petroleum and gas exports such as Bolivia, Ecuador, and Venezuela, price volatility can cause great macroeconomic and fiscal instability, except where effective stabilization mechanisms have been implemented—which has hardly been common in these countries. Therefore, even though expropriation is more prevalent and generalized during periods of high prices, the governments of hydrocarbon-exporting countries may be tempted to renege on their contractual terms and, in particular, squeeze state companies in the event that prices drop and the government faces a fiscal crisis.

Availability of Resources, Exportable Excess Volumes, and Fiscal Dependency

The incentives of governments are influenced in a specific manner by the availability of the country's energy resources and its status as a net exporter or importer. Countries with scarce proven reserves in proportion to their internal market and that need to increase investment and production in the sector, such as Colombia and Peru, will act very differently from countries with abundant resources and large installed investments, such as Mexico or Venezuela. Therefore, when analyzing the political oil economy, the distinction between countries with excess volumes and countries with shortages must be emphasized.¹²

Countries that are significant net exporters in relation to their population and the size of their economy and that have abundant or growing reserves tend to prioritize maximizing rents as a goal of their policies. Depending on the political-institutional framework, this maximization of rents will be carried out either based on a long-term perspective or with an emphasis on present rents. Maximization of production ceases to be a priority in these cases. In turn, countries that are net importers or on the road to becoming net importers and that have scarce and/or declining proven reserves will tend to have different policy goals: they will prioritize the maximization of production in order to become self-sufficient or to avoid becoming net importers in the future.¹³

It is possible to note certain regular traits in terms of how the oil and gas activity is organized depending on whether the countries in question are net importers or exporters of oil. The governments of net exporting countries will be more reluctant to privatize petroleum companies, considering that by maintaining them as state companies, they can be used as “petty cash” for the governments, which would be more difficult if they were private. Additionally, in countries that are net exporters, due to the fact that oil state companies tend to have fewer financial deficits than their counterparts in net importing countries or compared to other state companies in sectors lacking rents, the classical arguments in favor of privatization are less evident.¹⁴

Whenever oil prices rise significantly, the trend toward resource nationalization and increasing taxes is common in net exporters. In those cases where governments are willing to offer foreign investors access to their petroleum reserves, net exporters with substantial reserves have a lot of power during negotiations with international companies, considering that the latter have very few alternatives of this kind since most of the proven oil reserves worldwide are in the hands of state companies.

The Fiscal and Contractual Framework of the Petroleum Sector

To fully understand the nature and implications of the fiscal and contractual framework of the petroleum sector, it is necessary to incorporate taxes as well as contributions, participations, and regulations set forth contractually for the operation of the reservoir. Both from the state’s point of view as well as the point of view of the operator, the most relevant elements is the amount, the time, and the manner according to which the operator, whether state-owned or private, will transfer resources proceeding from the revenue of the operation to the state. It is also crucial to understand at what price this flow of revenue will be generated, and whether the state has power to regulate it or if it will be an international market price. In other words, how are the property rights resulting from the flows of revenue from the extraction of the resource assigned? This makes it necessary to analyze the entire set of fiscal and contracting rules.

In almost all countries in the world, with the important exception of the United States, the state owns the subsoil and its resources. However, in some countries, the state grants concessions that give the operator property rights over the resource for a specific period of time. This is known as a *concession*. The operator pays royalties and taxes in accordance with the exploitation activities that are carried out. In the case of other types of contracts, the state retains ownership of the resource, and operators are entitled to receive a portion of the profits obtained through their exploitation, although they do not own the oil and gas in the subsoil. The portion that is obtained by the operators depends on the contractual terms and conditions.¹⁵

The fiscal rules of hydrocarbon exploitation are established through a variety of taxes and, in some cases, contractual shares of the state. The most common means include bonuses, royalties, and taxes on profits. Finally, there are other special taxes such as export taxes, windfall profit taxes, and resource taxes.¹⁶

The royalty or tax rate may vary in accordance with a scale based on production or profitability. In a similar manner, the production/profit-sharing agreements or risk service contracts tend to have a progressive scale according to which the state share grows as profitability of the project increases. The tax on windfall profits is a variation of this type of mechanism that is applied when prices or profitability reach significant levels.

There are a variety of desirable criteria that can be used to evaluate the fiscal and contractual framework, some of which cannot be achieved simultaneously; therefore, there are *trade-offs* among these objectives.¹⁷ Generally speaking, the value of the nation's resources must be maximized, stimulating the development of the sector's potential. To do so, it is necessary to establish conditions directed at ensuring the profitability of the projects for their investors. On the other hand, the economic rents must be captured.

The most relevant criterion in terms of the relationship between state and investor is progressivity, which means that the government-take goes up as profitability of the project increases. Royalties and especially bonuses are regressive: the higher the profit, the lower the government-take over profits. Taxes on profits are less regressive, although they are generally also not efficient at collecting revenue. The mechanisms that are progressive are those whose rates vary based on a profitability indicator, such as production-sharing agreements with variable rates and windfall profit taxes. These mechanisms are more sophisticated, more susceptible to evasion, and require major monitoring by the state. In the event that a fiscal framework is not progressive, the state will have very powerful incentives to change it as rents increase—for example, due to an increase in the price or the discovery of a very productive deposit.

The instability of the fiscal and contractual frameworks could be reduced if they were less rigid and more progressive. Why is it then that, in general, developing countries do not have more progressive fiscal rules? The explanation focuses mostly on variables of political economy that ensure that governments prefer fiscal systems that are easy to implement, that do not require much monitoring of the sector, that guarantee a state share under any economic circumstance, and that reduce the fiscal income volatility of petroleum revenues. The states fear that existing asymmetries of information between the collecting entity and the companies are used by the latter to evade payment of taxes.¹⁸ Also, governments generally have short-term horizons and therefore prefer greater present payments than a larger total government-take over the long term. Finally, many governments, being dependent on the income from revenues of this type, tend to implement fiscal systems that generate more stable flows of tax revenue, even when they are less efficient.

The Latin American Experience: Cycles of Investment and Expropriation

This section analyzes case studies from Latin America to evaluate the factors that induce expropriation cycles. The countries of this region have used a variety of contractual and tax systems to regulate petroleum activities and collect the revenues that are generated thereby. Within such diversity, the majority of the systems have been regressive or slightly progressive. Monaldi and Manzano (2008) and Sinott et al. (2010), among others, show that

the government-take did not initially increase as a result of the increase in prices during the past decade; as a matter of fact, in some countries, it decreased. This contributed to the renegotiation of contracts, tax changes, and the creation of windfall profit taxes. Argentina, Bolivia, Ecuador, Venezuela, and, more recently, Brazil increased the government-take. In the case of Brazil, this increase did not apply to already-signed contracts. In the other cases, it was applied retroactively, which meant the cancellation, forced renegotiation, or expropriation of preexisting contracts.¹⁹

For example, in Venezuela, the royalty rate was increased from one percent to 33 percent for contracts covering the extra-heavy Orinoco Oil Belt, and the corporate income tax rate was raised from 34 percent to 50 percent. Additionally, a new windfall profits tax was implemented. In Bolivia, royalties on gas were increased substantially, and in Argentina, a new export tax was applied at a rate of 30 percent. In Ecuador, forced renegotiation transformed all projects into low-profitability service agreements, although an aggressive windfall profits tax had been previously implemented (which collected 99 percent of the profit at high oil prices). In Argentina, Bolivia, Ecuador, and Venezuela, several projects were partially or entirely nationalized. In Brazil, after the successful pre-salt discoveries, the government decided to increase the state's share via taxes, shareholding, control of operations, and local content.

Venezuela

Venezuela is perhaps the most relevant case for Mexico because it is the other large exporter in the region and also has a long tradition as a producer.²⁰ The case of Venezuela illustrates the dynamics I have commented on in terms of how expropriation cycles follow successful cycles of investment, and how cycles of high prices provide incentives for expropriation. Venezuela has behaved as would be expected of a typical net exporter with high discount rates, with the clear goal of maximizing short-term revenue and subsidizing the domestic market for oil products such as gasoline. Likewise, the case of Venezuela also demonstrates the conflicts that are created between governments, companies, and other players when very inflexible fiscal systems do not allow governments to collect rents resulting from price increases.

Throughout the history of the Venezuelan oil industry, there have been two investment cycles followed by very different expropriation cycles. During the first cycle, after decades of investment by mainly international companies, the taxes imposed on these companies increased significantly in the 1960s and 1970s, and petroleum concessions were not renewed. As a result, oil investment declined from 1958 until 1976. On the other hand, production continued to increase until the early 1970s when it abruptly dropped, although this occurred much later than the drop the investment—as tends to happen in industries that have high sunken costs—reducing the apparent political costs of decisions that adversely affect the industry. Afterward, in 1976, the petroleum industry was nationalized. *Petróleos de Venezuela, S.A. (PDVSA)*, the recently established national oil company, increased investment significantly, propped up by high oil prices. PDVSA was designed

with a system of governance that minimized political interference and excessive extraction of revenues by the government, guaranteeing its financial and operational autonomy.

The second cycle of investment started at the beginning of the 1990s within a context that required enormous new investments to increase production. Under these circumstances, PDVSA significantly increased capital expenditures in order to handle such investments. At the same time, the fiscal difficulties experienced by the Venezuelan government led to the opening of the petroleum sector to private operators, initially in areas with little profitability and with significant technological and operational challenges that required high investments, which PDVSA did not want to make alone. The government opened the sector to private investment using a special contractual framework that provided important guarantees against the renegeing of commitments assumed by the government, using PDVSA and its assets abroad as a guaranty. As a result of these contracts, private investment increased substantially toward the end of the 1990s and privately operated production rose to 1.1 million barrels per day by 2005, accounting for more than a third of total production (Manzano and Monaldi 2010).

When President Chávez, an extremely harsh critic of opening the industry to private capital, came to power in 1999, the government began to extract more resources from PDVSA. However, until 2005, the executive branch did not adopt any measures to change contracts and tax conditions or to nationalize the capital of companies. Why did it take the government almost six years after coming to power to once again nationalize the industry? The explanation seems to lie in the guarantees and conditions established in the contracts that made it difficult to breach them without significant costs for the nation, the difficulty of getting rid of the institutional autonomy of PDVSA, and the fact that significant investments by private parties were still planned for the period 1999-2004 (Manzano and Monaldi 2010).

Between 2002 and 2003, the initiatives of the government to eliminate the autonomy of PDVSA resulted in a massive strike, which dramatically decreased public investment and production. The government laid off half the workforce and the majority of managers, taking over complete political control of the company. By 2004, the cycle of private investment had been completed, and high international prices were ensuring solid profits over the short run for the government in the event that it reneged on its commitments stipulated under the oil contracts. During the following two years, the petroleum contractual framework changed significantly, and both the government-take on profits and control over private investment increased significantly. In 2007, the government “nationalized” the petroleum industry and took majority control over all projects operated by private parties without offering any market compensation. The weakening of domestic institutions resulted in a new expropriation cycle (Monaldi 2010).

Since 2009—although much more pronounced since 2012—the decline in production in Venezuela and, more recently, the drop in prices have once again caused the Venezuelan government to want to attract investors to initiate a new investment cycle in the Orinoco Oil Belt and for offshore extraction of natural gas. Once again, history repeats itself: the

question is whether, in spite of the regulatory and political risks, these investments will be achieved. Multinational companies such as Chevron, ENI, and Repsol as well as Chinese and Russian state-owned companies have signed contracts to develop new projects. The trend is very clear: the Venezuelan government has been offering important concessions to international companies, among them better fiscal conditions, more operational control, international arbitration of loan agreements, and a more competitive exchange rate. It still remains to be seen whether this new “opening” is successful in attracting sufficient investment in order to avoid further decline in production.²¹

Ecuador

The case of Ecuador also offers interesting perspectives on the case of Mexico.²² Historically, Petroecuador/Petroamazonas—like PEMEX, at least until the reform—has had limited financial and operational autonomy. The government, rather than the company, collected the revenue from petroleum, transferring to the National Oil Company (NOC) limited resources intended for investment. Therefore, the company experienced persistent difficulties in terms of complying with its expansion plans. Due to the financial difficulties of the state-owned company and the drop in the price of oil, attractive conditions were offered to private parties in the 1990s. In 1993, production-sharing agreements were signed, and in 1999, mixed companies were established. The reforms in the 1990s successfully attracted investment, and the private sector became the country’s main producer, overtaking the state. At the start of the 1990s, annual foreign investment in petroleum was less than USD 200 million; in 2000, the number exceeded USD one billion (Monaldi 2010).

President Rafael Correa was elected in 2006 on a nationalistic platform, and he enacted a significant increase in government control of petroleum activities and in the government-take. Initially, he increased the tax on profits applicable to petroleum companies from 30 percent to 50 percent; then, he established a windfall profits tax of 99 percent, and the contract with Occidental Petroleum was canceled. Likewise, the government accused several companies of tax evasion and demanded reparations. Finally, the government forced all companies to transform their profit sharing agreements and mixed companies into pure service contracts with limited attractiveness for operators. Several companies, among them Petrobras, abandoned the country (Musacchio et al. 2009).

Similar to the case of Venezuela, Ecuador’s success in attracting private investment in the 1990s together with the increase in oil prices generated powerful incentives and opportunities for the government to default on commitments. Likewise, as has also been the case in Mexico and Venezuela, the governance structure of the state-owned petroleum company has favored excessive profit expropriation by the government and has facilitated the stagnation of investment in the sector.

Recently, Ecuador signed large contracts with service companies such as Schlumberger to manage mature oil fields in terms that are very attractive to the contractor. Once again, the NOC is short of cash and pragmatism has led to a larger role for the private sector. Chinese

state-owned companies have also become key partners of the Ecuadorian state not only as operators but also as lenders to the country, getting repaid with exported crude oil. However, service agreements make attracting investment in high-risk projects difficult, as a result of which an increase in the flexibility of the institutional framework over the next years can be predicted, particularly if oil prices do not recover.

Bolivia

Bolivia represents another typical case of a country that has been highly successful in attracting investment and increasing gas production and reserves with a tax system designed during a period of low international hydrocarbon prices that was not sufficiently progressive over the short term.²³ As a result, as soon as international prices increased and most of the investments had already been immobilized, strong incentives were generated to renegotiate contracts and nationalize the industry.

Over the period from 1996 to 1997, the government put into practice an innovative process to privatize the state-owned petroleum company, Yacimientos Petrolíferos Fiscales Bolivianos (YPFB). During this process, Bolivia capitalized the country's pension funds with shares of YPFB and privatized the remainder. By making its fiscal and contractual framework attractive, it collected significant private investments in gas exploration and production. As a result, Bolivia managed to successfully increase foreign investment, production, exports, and natural gas reserves. Direct foreign investment in the hydrocarbons sector reached USD 2.5 billion over the period 1993-2002, representing 40 percent of all foreign investment in the country. Proven reserves of natural gas increased sevenfold, and net exports quadrupled.

The Bolivian tax system had characteristics that made it progressive in the long run but not over the short term. As explained before, this creates tension and distribution conflicts between governments and companies as soon as prices increase.²⁴ The increase in the international price of hydrocarbons and the fact that significant investment in the sector had already been completed created powerful incentives so that first, the government renegotiated the price of gas under export contracts and the state share of gas profits, and second, it proceeded with the nationalization of the industry.²⁵ These measures were overwhelmingly supported by the population in a referendum.²⁶ Royalties were raised from 18 percent to 50 percent, and the government obtained shareholding control over all hydrocarbon projects (Monaldi 2010; Musacchio et al. 2009). Similar to the cases of Argentina, Ecuador, and Venezuela, foreign investors were victims of their own success in generating growing income through exports.

Argentina

Argentina went from being a relevant exporter of oil in the 1990s—even surpassing Colombia—to recently becoming a net importer with decreasing production over the past decade. Like Bolivia and Venezuela, Argentina was very successful in the 1990s in opening the sector to private capital and privatizing the formerly state-owned company,

Yacimientos Petrolíferos Fiscales (YPF). However, with the macroeconomic crisis of 2001-2002, the country defaulted on all its contracts, created an export tax, and forced companies to subsidize the domestic market. Profitability of the sector was severely affected, which led to a significant drop in investment, production, and proven reserves. However, there were substantial discoveries of non-conventional resources in the area of Vaca Muerta that promise to make the country an energy powerhouse once again.²⁷ However, investment did not increase and hydrocarbon imports grew, generating a crisis in terms of the balance of payments. This caused the government to renationalize YPF in 2012, although in light of the need for a new investment cycle, the government immediately opened a new opportunity for private capital and changed the hydrocarbons law to make the conditions more attractive for investment. Chevron has become a key partner of YPF in Vaca Muerta.²⁸ Once again, the incentives provide a significant explanation for the development of the institutional framework (Maurer and Herrero 2012).

Brazil

In spite of its recent difficulties, there is no doubt that Brazil has been one of the most successful cases in the region over the past two decades. The institutional framework projected credibility to investors and, for a long time, it seemed to have protected the state-owned petroleum company from being “expropriated.” Brazil was the third-largest producer in the region, and it overtook Mexico in 2015 and Venezuela in 2016. However, until a few years ago, Brazil was a significant net importer. Brazil reduced its dependency on imports through a combination of long-term policies permitting production increases and replacing domestic oil consumption with ethanol and natural gas.

The petroleum sector was opened up to private investment from 1995 to 1997, eliminating the constitution-mandated monopoly of Petrobras, the state-owned petroleum company. To provide more credibility to the regulatory framework, the government created an independent regulatory agency to supervise the petroleum sector. Furthermore, Petrobras was partly privatized. Even though the state maintains control over the majority of shares with voting rights, a significant portion of the company’s capital is in private hands. As a result of the reforms, investment in Petrobras surpassed USD 46 billion over the period 1992-2002 and has continued to rise over the last decade. Since then, Brazil has carried out multiple bidding rounds for petroleum areas with private investors. As a result of these policies, great success was achieved in exploration and production.

The discoveries of massive offshore oil reserves in the Pre-salt province promised to make Brazil a relevant net exporter in the future, substantially changing the incentives of the government and its citizens. Even at a time when production of the pre-salt deposits was still incipient, with the expectation of abundance the country appeared to have assumed the attitude of a net exporter, focusing on rent collection and distribution. This caused some changes within the institutional framework. Among them, the following are noteworthy: 1) the requirement that all new offshore projects be operated by Petrobras and that the state-owned company must have a minimum equity participation of 30 percent in the capital; 2) the increase of the state’s equity share in Petrobras in exchange for access to

the pre-salt reserves, subject to terms which were considered by the “market” as an “expropriation” of the minority shareholders, with a resulting drop in share value; and 3) the increase in the national content requirements to very significant levels that greatly increased extraction costs. At the same time, a dispute broke out between regions and different interest groups regarding the allocation of future petroleum revenue, and the government forced the state-owned company to subsidize the domestic market. More recently, a large corruption scandal regarding the contracting practices of Petrobras has cast doubt on the exceptional character of the Brazilian petroleum industry, which had been *the* regional model. The company has not been able to attain its goals of production over the past few years, and with the drop in oil prices, significant restructuring has become necessary.

It is important to emphasize that unlike other countries in the region that changed their contracts, Brazil did not retroactively do so; changes in the law only applied to new contracts, while earlier ones continue to be governed by the conditions originally agreed upon. Therefore, although the changes that occurred within Petrobras were detrimental to minority shareholders, the case of Brazil differs from the aforementioned ones in nature. The impression is given that the new government in 2016 understands the need to make changes and recover the lost credibility of the state and the development model of the sector, which will motivate it to implement policies that are more favorable for investment, particularly in a low-price environment.

Colombia

Today, Colombia is a net exporter—the third-largest in the region, having surpassed Ecuador—although it still has a precarious endowment of proven reserves. The case of Colombia has significant similarities to the Mexican opening of the sector. In the decade of the 1990s, as a result of the discovery of significant highly productive deposits, oil became an important generator of foreign currency and tax income, accounting for more than 25 percent. However, starting in 1999, Colombia’s production and reserves began to collapse, and by 2004, it appeared inevitable that Colombia would become a net importer of oil during the following decade.

The Colombian case illustrates the potential hazards when a country assumes a revenue mentality after the discovery of reserves and a period of high investment, although it also shows how a state is capable of righting its course and adjusting policies in an effective manner. In the 1990s, the boom in petroleum production generated perverse macroeconomic effects and created fiscal difficulties and problems for competitiveness. Additionally, the contractual conditions were hardly attractive for investment in exploration, which was also harmed by the state of insecurity caused by guerrilla activity (Echeverry et al. 2009).

Unlike in the cases of Bolivia, Ecuador, and Venezuela, the price boom during the past decade found Colombia with dropping reserves and production in free fall, which did not generate incentives for expropriation. Quite to the contrary, Colombia required starting a

new cycle of investments. In view of the industry's decline, the Colombian state adopted a series of fiscal and contractual reforms in 2005 to make investment more attractive and improve the competitiveness of the state-owned company, Ecopetrol. Following the Brazilian model, which was also inspired by the Norwegian model, 10 percent of Ecopetrol's shares were very successfully placed on the stock market, which gave the company greater financial and operational autonomy; likewise, an independent regulatory agency was created. The credibility and attractiveness of investment generated by these institutional reforms initiated a quick reversal of the production decline. Between 2007 and 2010, production increased by more than 150 thousand barrels per day.²⁹

There were still some societal pressures to increase state control after the recent increase in production. These pressures have been contained, in part because the country has not managed to incorporate significant new reserves—despite a significant increase in exploration—and partly because its production has relatively high costs and risks. As a matter of fact, in light of the drop in prices since 2014, Colombia has announced that it will make the conditions of investment even more attractive.

Implications for the Case of Mexico's Petroleum Reform

This section will discuss the implications of the regional analysis for the case of Mexico's energy reform. The following are some general lessons that are suggested by the analysis in the preceding sections:

1. Attempts must be made to establish progressive fiscal and contractual rules that maintain competitiveness, allowing the state to collect revenues at different levels of price and profitability. As much as possible, these rules must be simple and transparent, and they must guarantee a minimum level of the state's share of profits.
2. From a political point of view, it is not sufficient that the fiscal and contractual frameworks are progressive throughout the life of the project, but rather that the government-take should increase automatically in the case of significant price increases. Otherwise, the fiscal framework will tend to become unstable with price volatility. It is important to take these types of political considerations—not only economic ones—into account in the design of fiscal mechanisms.
3. Having an institutional and contractual framework with little credibility creates significant costs in terms of investments foregone or a smaller state share of profits. With greater regulatory risk, it will be necessary to offer greater returns concentrated at the start of the project. Paradoxically, therefore, the more the state limits its opportunistic discretion in the future, the more it will be able to obtain better *ex ante* conditions. Therefore, issues such as the conditions and processes for contract cancellation must be very clearly defined so as to not generate unnecessary uncertainty. On the other hand, mechanisms such as international arbitration and bilateral investment treaties can serve to obtain credibility, even at a cost of discretion and flexibility.

4. The risks of the reversal of opening an industry to private capital are relevant, judging by the history of the sector in the region and in other developing countries. The failure to attract sufficient investment may be one cause for reversal, although it is more likely that great success in terms of increasing reserves and production may create incentives for the renegotiation of contracts. A sudden increase in the international price of oil might also create strong incentives for renegotiation. Finally, if political sectors opposed to the energy reform are elected to the executive branch, such as leftist candidate Andrés Manuel López Obrador, this might generate pressure to change the fiscal and contractual framework. A key point is whether these changes are retroactive by nature and affect contracts already in force or whether they are only applied to new contracts. Over the long term, a reputation is earned through the handling of situations that arise and not only based on what is written on paper.

The Case of Mexico

The case of Mexico is the focus of the other chapters of this volume, and therefore at this point, we will only briefly comment on how it fits within the conceptual framework described in the foregoing sections. Since the 1980s, with the discovery of important deposits in shallow waters, Mexico has been an important net exporter and, until very recently, the main producer in the region.

Even though oil has ceased to account for a significant share of exports, it continues to be significant for the nation's fiscal revenues. At its peak, the revenue from petroleum accounted for approximately one-third of the total state income. Fiscal dependency on petroleum is higher only in Venezuela and Ecuador, which is surprising, considering that Mexico is the most diversified economy of the region. This fiscal dependency has caused the petroleum industry to be viewed by the authorities basically as a source of revenue and not as an activity that generates economic growth.

The case of Mexico has been emblematic of using a state company as a fiscal, financial, and political tool, which has also occurred in other important net exporters. The excessive collection of rents kept the state company under pressure to obtain higher current revenues at the cost of replacing its oil reserves and, therefore, at the expense of its future production. The lack of PEMEX's financial autonomy was reflected by the fact that the company carried excessive debt in order to comply with its fiscal commitments and posted losses after taxes on a regular basis in spite of its tremendous cash flow, which it was not allowed to sufficiently invest in order to restore its reserves.

“Milking the cash cow” was possible without a drop in production thanks to the immense productivity of shallow water fields, particularly the Cantarell field, which was exploited intensively and reached levels of production surpassing two million barrels per day (close to two-thirds of the total domestic production). However, when production of this field began to collapse in the middle of the last decade, the PEMEX's fall in production became unstoppable. The company substantially increased its investment, more than doubling it,

which allowed it raise the production of other fields by more than 700 thousand barrels; even in this manner, however, it was not able to avoid a substantial decline in total production and proven reserves. To provide an idea of the magnitude of the investment that PEMEX has to make, it is worthwhile to emphasize that, in 2013-2014, PEMEX invested more than all other Mexican companies listed on the stock exchange combined.

This set of circumstances—namely, the drop in production and reserves—combined with a substantial increase in investment created extremely powerful incentives to open the industry to private capital and technology even at high oil prices such as the ones that prevailed over the period 2004-2014, except for a brief drop during the financial crisis of 2008-2009. Geology was a determining factor for the change of incentives, considering that the most productive areas with the lowest risk in shallow waters were starting to become depleted and the portfolio of future projects for the expansion of production and reserves requires the assumption of significant risks and very high investments, as well as the incorporation of technologies with which PEMEX is not familiar.

An initial attempt to open up the industry occurred during the previous presidency of Felipe Calderón of the National Action Party (PAN), although the opposition in Congress led by the Institutional Revolutionary Party (PRI) and the Party of the Democratic Revolution (PRD), only agreed to a very timid reform that only generated modest progress on the basis of limited service agreements. Finally, with the new administration of President Enrique Peña Nieto of the PRI, it was possible to go ahead with a very ambitious reform with the support of the PAN.

The reform provides for the possibility of upstream foreign investment and allows the use of licenses, production-sharing contracts, profit-sharing agreements, and risk or pure service contracts, with or without state equity participation. With the authorization of the Minister of Energy, PEMEX can enter into associations for the development of areas assigned to it. The reform also represents a significant change in the governance of the state-owned company: PEMEX maintains its ownership by the state, although it is provided with increased autonomy and reinforced accountability. The reform establishes or reinforces regulatory agencies for block assignments, safety and environmental protection, and the fiscal monitoring of contracts. Likewise, the reform creates a fiscal stabilization fund and establishes principles of transparency.

Some points of the reform that are noteworthy from the perspective of this article are the following:

1. The fact that a constitutional reform was approved that required super-majorities separates the case of Mexico from others in the region. Although the Brazilian reform also required changing the constitution, the Mexican reform is more comprehensive and detailed and provides a solid footing for long-term oil policy. Only the maintenance of PEMEX as a 100 percent state-owned company makes the Mexican reform less significant in this particular respect compared with those carried out in Brazil, Colombia, and Peru. Party fragmentation in the

- Mexican political system and the division of powers that this tends to imply make it a constitutional reform that will not be easy to overturn in the future.
2. The fact that Mexican leftist parties and a good part of public opinion have actively opposed the reform or viewed it with suspicion creates a potential problem of credibility in the future. A scenario in which a popular majority can be built that favors overturning the reforms is perfectly conceivable, and it remains to be seen whether the political institutional system will turn this into a reversal of the fiscal and contractual framework. The pronounced petroleum nationalism that has characterized public opinion in Mexico and the strong suspicion that powerful interests may benefit at the expense of the nation creates a breeding ground for a discourse of demands in the event that the appropriate circumstances arise.
 3. The structure of the institutional framework of the petroleum reform in general has some traits that make it a good basis for creating regulatory and contractual credibility. The politically independent regulatory agency, the new autonomy of PEMEX, and the weights and counterweights between different state entities create a grid of veto points that makes an opportunistic individual action by a single player difficult. Certainly, the excessive number of players involved may hinder effectiveness and implementation, although it offers greater guarantees to prevent a process equivalent to those that took place in Argentina, Bolivia, Ecuador, and Venezuela. Additionally, Mexico has an advantage over these countries insofar as the general perception of the stability of the rule of law for investors is concerned, which, although not very high compared with its partners in the Organization for Economic Co-operation and Development (OECD), is above the regional average and very much above that of Venezuela.³⁰ Likewise, both the international integration of the Mexican economy, which is highly diversified and depends significantly on foreign investment, and Mexico's participation in multiple free-trade and investment agreements offer significant additional guarantees.
 4. The fiscal and contractual framework of the petroleum reform is progressive. The royalty rate, meaning the percentage of gross income obtained by the state, increases with the oil price, and the regressive character of this instrument is thereby significantly avoided. Likewise, under production-sharing agreements, the state's share of profits increases as the profitability of the project grows. Furthermore, the contractual government-take has been the fundamental parameter of the transparent auctions to assign the blocks, which lends legitimacy to the distribution of the revenue obtained. The Ministry of Finance establishes the minimum for each block auctioned, setting a floor for state participation.
 5. Despite proper design of the fiscal and contractual framework, two issues that may create a lot of controversy in the future are still pending: a) state participation will be relatively low initially, which is logical because investors have not yet recovered their investment, but in the event that the price rises

quickly or in the case of a large discovery of reserves, it is possible that the progressive elements of the contract are not sufficient to calm short-term revenue pressures; and b) the state's share of profits under contracts with private operators will in general be substantially less than the average obtained under PEMEX projects. Again, this is reasonable since the bidding rounds cover projects with greater risk whose profitability will, in most cases, be less than the average of the PEMEX portfolio. Furthermore, many PEMEX projects have already been amortized and are low-risk projects because they are at the extraction stage. However, this may appear suspicious and insufficient during some years when payments per barrel are reported by the private sector that are much lower compared with those of PEMEX, particularly during the initial stage of the projects. These two issues suggest the crucial importance of transparency regarding the issue of revenue collection, although also there is the need to inform political players and the public about the complexity of this issue and the fact that higher risk can only be compensated through a higher return for the investors. This may be particularly difficult to accept in the event of a major discovery, equivalent to the Brazilian Pre-salt or Cantarell. How can high profits for a transnational company be justified when the lottery risks have already dematerialized and people only see the large prize after the fact? It will be very easy to create the impression that the nation's natural wealth was given away with few benefits for the nation.

6. Items 2 and 5 are connected with one last issue: the importance of making the reasons for and the process of annulling or cancelling contracts very clear, as well as the legal remedies that are available to investors. Although the state must be able to act in a sovereign manner in case of non-compliance by operators, it is crucial that solid guarantees be offered so that this process will not be used for opportunistic purposes for renegotiation or for retaining high-profitability projects as soon as the risks decrease. The threat of cancellation may represent a very powerful weapon for the executive branch or PEMEX to force the renegotiation of its share of profits. This is not a theoretical argument, but rather one that reflects experience in many other countries during periods of regulatory "expropriation." Considering that investors cannot easily quantify this risk, this may have a negative impact on the bids they submit in the auctions or may even cause them to refrain from participating as long as the risk is judged to be significant. For the state, it could be an important gain to credibly assume the obligation of refraining from canceling contracts in an opportunistic manner. How to do this without sacrificing sovereignty and the regulatory flexibility to adjust to changes in the environment, and at the same time maintain an efficient mechanism to monitor and sanction contractual non-compliance by operators, is one of the challenges faced by the implementation of the reform.³¹

Mexico's petroleum reform has been much more significant than predicted by the majority of analysts. In general, it seems to offer a very solid institutional framework for the petroleum sector. Mexico was able to use the fact that it was the last country to open this sector to learn from prior experiences in the region and throughout the world. This should offer important guarantees for investors that, combined with the large geological potential of Mexico, might create significant attractiveness. Furthermore, its proximity to the United States offers great advantages because it has the most developed petroleum services industry in the world and geology with important similarities to that of Mexico.

However, in addition to being a part of North America, Mexico is also a part of Latin America, a region with a reputation of great instability insofar as industry regulation is concerned. Therefore, it should be expected that significant changes in the political environment, the price of oil, or the geologic lottery may create incentives to overturn the reform. Therefore, the perception of risk will depend on the handling and institutional construction of the reform and not only on its initial architecture.

The lowering of prices that began in 2014 creates major difficulties for the success of the reform, since it will be harder to attract investment in areas with low geological attractiveness. The government is forced to reevaluate its expectations in terms of tax shares, although at the same time, it must take care to avoid the perception that it is "giving away" the national wealth and obtaining little in return; therefore, it will be difficult to leave it up to the market to decide on the value of blocks during auctions, and the government will want to maintain minimum government-take levels. On the other hand, the lower prices for crude oil make the reform even more relevant, because the prior model was even more unviable, considering the pressure on PEMEX's cash flow. Finally, with low prices, decreasing investors' perception of "surface" risks, which cause them to demand a higher return or discourage them from participating, becomes even more important.

Of course, there are contingencies impossible to predict that will certainly surprise us, but at least it is paramount to attempt avoiding those contingencies that are actually easy to predict, such as price changes or significant discoveries, that would throw the reforms and the development of the immense geological potential of Mexico off track. Finally, it will always be necessary to periodically adjust the legal and institutional framework of the sector; the key is to carry out such adjustments in a manner that does not destroy its credibility and guarantees predictability on how unavoidable disputes between the state and investors will be resolved, thereby ensuring that the best interests of the nation are not incompatible with the long-term development of the sector.

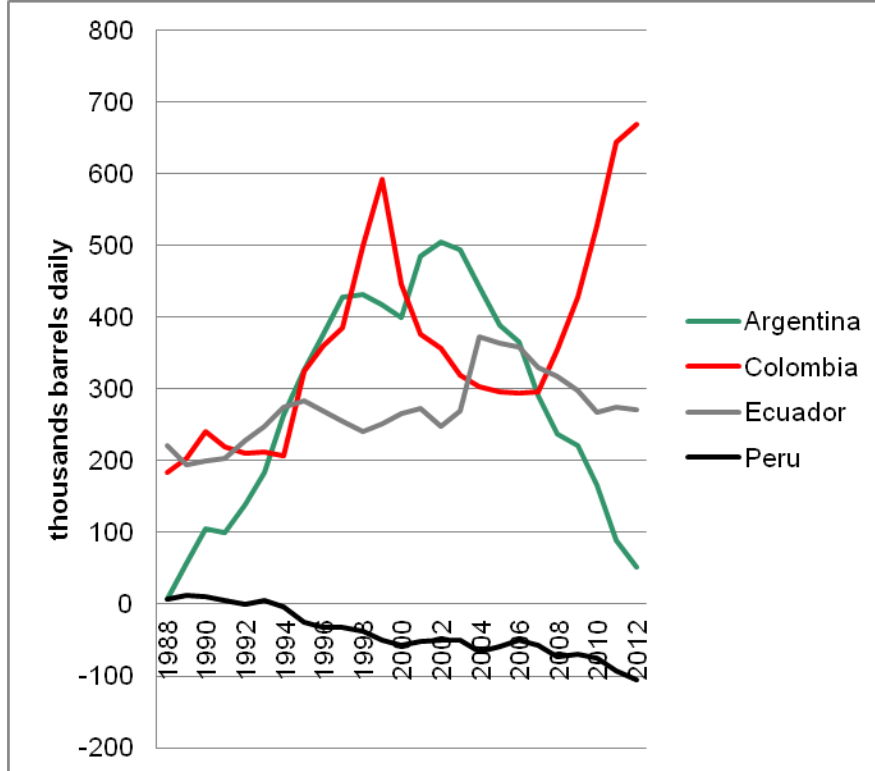
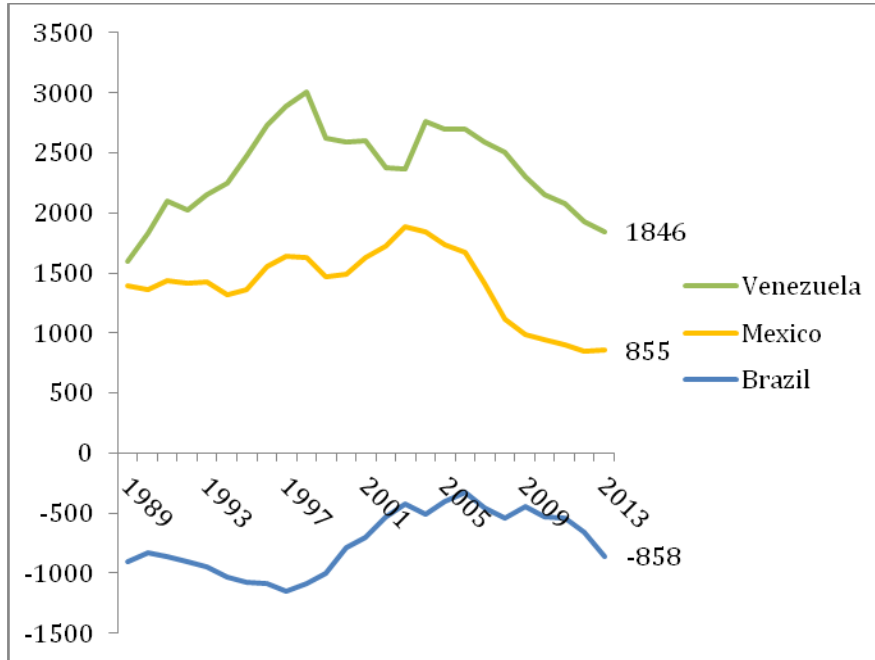
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Appendix

Figures 1 and 2. Net Exports (in thousands of barrels per day)



Source: "BP Statistical Review of World Energy," 2014.

Figure 3. Proven Reserves (in billions of barrels)

Proven Reserves (Billion barrels)			
	1993	2003	2013
Argentina	2.2	2.7	2.4
Brazil	5.0	10.6	15.6
Colombia	3.2	1.5	2.4
Ecuador	3.7	5.1	8.2
Mexico	50.8	16	11.1
Peru	0.8	0.9	1.4
Venezuela	64.4	77.2	298.3
Total	128.7	114.8	338.4

Source: “BP Statistical Review of World Energy,” 2014.

Endnotes

¹ Three countries—Mexico, Venezuela and Argentina—declined substantially, and two—Brazil and Colombia—partially compensated. In general, it can be concluded that except for these two countries, the region wasted the opportunity of the price boom.

² The extraction rate is the ratio between production and reserves. The region has 20 percent of the worldwide oil reserves, but only 11 percent of production.

³ One important element to consider is the preponderance of state-owned companies in countries with a relevant oil production. No other industry of tradable goods is dominated in such a manner by the public sector. Most of the petroleum reserves of the region and in the world are in the hands of state-owned companies (or mixed companies) such as PEMEX, PDVSA, Petrobras, YPF, Ecopetrol, and Petroecuador. Due to their nature, in spite of being less efficient, state-owned companies tend to be subject to higher tax rates, in many cases at the cost of long-term investment. Typically, state-owned companies operate in mature areas of production with greater rents and fewer risks. States generally invite the private sector to invest in areas with a greater geological risk, greater technological complexity, and lower rents, and reserve the best areas for the state-owned company. State-owned companies may be just as susceptible as, or even more susceptible than, private companies to “expropriation” cycles, in this case through increases in the extraction of revenues by the state, making it impossible to carry out the investments that are necessary to maintain or increase future production.

⁴ Rents may be the result of the presence of naturally low extraction costs of high-quality mineral deposits (with higher prices) regarding a marginal producer. Rents may also be the result of natural relative scarcity, restrictions in terms of access to reserves, or production restrictions, which are typically within the scope of cartels’ actions.

⁵ Seismic studies, the exploration and development of fields, and the construction of oil pipelines or gas pipelines are examples of immobilized assets.

⁶ One extreme example of sunken costs is the Kashagan project in Kazakhstan. A consortium of international companies invested more than USD 50 billion and has not yet started production more than 15 years after the start of the project. It is estimated that operating costs will be around USD 8 per barrel. As long as, let’s say, a price of more than USD 15 per barrel is obtained, the consortium would have incentives to continue operating even without recovering sunken costs.

⁷ The fact that in the case of the hydrocarbons sector, products are consumed widely by the population and represent a significant portion of its basket of consumption causes consumers to pressure governments to establish cross-subsidies or other regulations that favor specific interest groups and also makes the domestic price a highly politicized issue.

⁸ Expropriation of the profits of state-owned companies may also generate political benefits over the short term with long-term effects on production and investment, depending on their corporate governance and political-institutional framework, among other variables. As a matter of fact, state companies have in some cases been the greatest

victims of over-extraction of revenue by states. Over the past decades, PEMEX and PDVSA have been obvious examples thereof. The “expropriation” of revenues from state-owned companies is the rule rather than the exception in the region. Petrobras is an interesting case study of a state company that has managed to maintain its capacity of investment and that has expanded beyond its borders, although it has recently also fallen victim to politicization and corruption, as well as being used for goals other than petroleum-related activity.

⁹ As a matter of fact, external mechanisms to ensure compliance with commitments have played a much more important role than national institutions throughout the history of investment in oil and minerals in developing countries.

¹⁰ This phenomenon was initially identified by Raymond Vernon, who called it “the obsolescing bargain.”

¹¹ There are exceptions, such as Petrobras (Brazil) and Statoil (Norway), which have excelled in terms of their capacity for offshore extraction and in different regions of the world.

¹² It is important to emphasize that the level of proven reserves is not completely exogenous; i.e., it is not only based on the natural abundance of the resource in the subsoil, but rather also significantly depends on investment in exploration, technological changes, and the oil price level on the international market. As a result, up to certain point, the existence of reserves is endogenous to the institutional framework and the policies that have prevailed in the past. At the same time, reserves are a primordial determinant of the institutions and policies that are developed by countries.

¹³ Even though, of course, they are also interested in collecting revenues, this is not their first priority; they are interested in developing those marginal deposits where, at prevailing prices, there are no rents, although they are economically viable with a reduced tax burden. From the point of view of net-importing governments, revenues are not generated on the international market but rather are extracted from their citizens. Therefore, they are concerned about the impact of increases in international prices on domestic consumers. It is for this reason, and due to the need to avoid high demand for foreign currencies for the import of hydrocarbons, that the interests of these governments are aimed at investment and long-term production.

¹⁴ State-owned oil companies will tend to prevail in mature petroleum provinces where the risks have been identified and technology is accessible through service companies. In new developments at the geologic and/or technological frontier, even governments of net-exporting countries will be more inclined to accept the presence of multinational companies (Nolan and Thurber 2010).

¹⁵ Exploitation licenses are similar to concessions, except that ownership of the resource remains in the hands of the state.

¹⁶ Bonuses are payments that the operator makes to the state when signing the contract or achieving certain project milestones.

¹⁷ The criteria that are generally used are the following: 1) Neutrality: it must permit the development of projects with different characteristics and levels of profitability. 2) Progressivity: it must be capable of capturing rents under different scenarios of prices, costs, and production. 3) Stability: it is desirable that it would be as stable and predictable as possible to reduce uncertainty and its negative effects on investment. 4) Incentives to limit costs: it must provide incentives for the operator to control its costs. 5) Volatility of tax revenues: considering the significant volatility in terms of petroleum prices and its harmful effect on macroeconomic stability, states prefer that the fiscal mechanism guarantee a certain level and stability of tax revenue. 6) Competitiveness: whenever countries compete to attract investments in the hydrocarbons sector, it is necessary that they are competitive internationally. This means that profitability adjusted for the project risk after taxes must be comparable with that of its competitors. 7) Simplicity and transparency: it is desirable that the same be easy to administer (without excessive monitoring costs) and that this administration be transparent (Monaldi 2012; Tissot 2010).

¹⁸ It is assumed that, due to the nature of the asymmetries of information in this sector—particularly in the case of transnational companies—and considering that the collecting bureaucracies do not have the level of knowledge of its peers as companies, the most sophisticated fiscal systems, which are more efficient from the economic point of view and which more effectively capture rents, may allow companies to evade taxes.

¹⁹ This pattern of expropriation has also been found in Russia, Kazakhstan, Libya, Yemen, and other developing countries (Monaldi 2010).

²⁰ Venezuela has been the first- or second-largest producer of oil and the largest exporter in the region and has by far the largest reserves of hydrocarbons. Venezuela is the only Latin-American country that is a founding member of the Organization of Oil Exporting Countries (OPEC). Oil is the main source of tax revenue and represents more than 50 percent of tax revenue and more than 90 percent of exports. Since 1928, oil has been the main source of exports.

²¹ In 2013, Chevron obtained a new contract with important guarantees for the investor in exchange for a loan to its mixed company with PDVSA. Other companies such as CNPC and Repsol have done the same. It is worthwhile to note that a significant offshore gas project in association with Repsol and ENI was finished. Thus, with proper conditions, it is still possible to attract investment.

²² Ecuador is the fourth-largest exporter and has the fourth-largest reserves in the region. Oil generated more than one-third of the tax revenue of the country and represented around half the amount of exports.

²³ Bolivia does not have any significant oil reserves, but does have natural gas reserves. Over the past decade, Bolivia has become the largest exporter of natural gas and has been ranked second in terms of proven gas reserves in the region and first insofar as free gas reserves are concerned.

²⁴ Over the entire life of the project, the fiscal system was progressive, although over the short term, the state captured a smaller part of revenues.

²⁵ The origin of gas revenues changed in 1999, which had significant consequences for the political economy of the sector. Before Bolivia started to export natural gas to Brazil, a majority of the fiscal gas revenue came from the Bolivian domestic market. As a result, there were local political pressures to not increase the price of the product. Since 1999, most of the state's profits come from gas exports to Brazil. This change caused the political economy of the sector to implement the same incentives that exist within a typical net exporter in lieu of those appropriate for a net importer.

²⁶ It must be pointed out that in the case of Bolivia, nationalistic pressure emerged through opposition to the government of the President Gonzalo Sánchez de Losada and was a significant factor for his overthrow and the eventual rise to power of Evo Morales.

²⁷ The technological advances in the United States in terms of the production of *shale* gas make the exploitation of Vaca Muerta possible.

²⁸ It is worthwhile to point out that *shale* production is characterized by sunken costs that are much lower than those of traditional petroleum exploitation and by the need for permanent investment; this makes it less susceptible to expropriation.

²⁹ In large part due to the private company Pacific, led by Venezuelan expatriates that had been laid off by PDVSA during the Chávez government.

³⁰ For example, according to the governance indicators of the World Bank and the World Economic Forum.

³¹ It should be noted that in view of the scarce interest from investors during the first auction of the first round, important changes were made to clarify the conditions and procedures for the cancellation of contracts as well as the use of arbitration clauses.