

UPSTREAM OIL AND GAS LEGAL FRAMEWORKS: BRAZIL AND THE UNITED STATES COMPARED

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I.	INTRODUCTION.....	976
II.	OVERVIEW OF BRAZILIAN AND AMERICAN REGIMES.....	976
	A. <i>Brazilian Dual Regime: Concession and Production Sharing Agreement</i>	977
	1. Overview.....	977
	2. Reserves and Production.....	979
	3. Concession Regime.....	981
	a. The Granting of Exploration and Production Rights: Brazilian Rounds	983
	4. Production Sharing Agreement.....	985
	B. <i>American Leasing</i>	987
	1. Overview.....	988
	2. Reserves and Production.....	989
	3. Lease Agreement	991
III.	COMPARATIVE ANALYSIS OF SELECTED TOPICS	995
	A. <i>Hydrocarbons Ownership</i>	995
	1. The Rule of Capture.....	995
	2. Strategic Relevance of Hydrocarbons Ownership	997
	B. <i>NOC v. IOC</i>	998
	1. The Origins of the NOCs	998
	2. The Two Models	999
	3. United States Versus Brazil	1000
IV.	CONCLUSION	1003

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I. INTRODUCTION

Both Brazil and the United States are important participants in the oil and gas industries. While the latter has a long history as a major player in this sector, Brazil is aiming for the top. Thus, it is likely that both countries will continue to have crucial roles in this disputed field. Nonetheless, Brazil and the United States have important differences and similarities in their legal frameworks and structural approaches to the exploration and production of oil and gas.

In an attempt to understand how these two countries compare in their legal frameworks, this Article offers a comparative analysis of the oil and gas exploration and production regimes in Brazil and the United States, including how they deal with the question of strategic ownership of hydrocarbons and the dichotomy between national and international oil companies. The Article explores the contrast between private and public ownership of hydrocarbons, their determinants, and consequences. This discussion is closely related to the role played by oil companies—whether public or private—and the tension between profitability and public policy goals.

Part II offers *estimates* of production and reserves for each country, and it provides an overview of both the Brazilian dual regime and the American leasing system. It explains the basics of how Brazil's concession and production sharing agreement regimes work, and it describes the United States's leasing rules and regulations. It also describes the granting of oil and gas exploration and production rights and the role of the regulatory agencies in each country. Following this initial outline, Part III analyzes in more detail some specific differences between Brazil and the United States: first, the issue of *in situ* hydrocarbon ownership, comparing public ownership in Brazil versus private ownership in the United States; second, the pros and cons arising from the use of a national oil company, or an international oil company, as the main vehicle to promote hydrocarbons development. Part IV concludes with a final discussion of selected contrasts to recognize that each approach—with its upsides and downsides—seems to fit the historical context and legal environment of each country with no clear “better model.”

II. OVERVIEW OF BRAZILIAN AND AMERICAN REGIMES

This Part provides an overview of production and reserves metrics for both Brazil and the United States as well as a description of the regulatory regimes of each country, including the regulatory structure and the role of the agencies.

A. *Brazilian Dual Regime: Concession and Production Sharing Agreement*

1. Overview

The Brazilian Federal Constitution, enacted in 1988, provided that all national oil and natural gas reserves were public property and belonged to the Federal Government.¹ The Union held a natural monopoly over research, exploration, production, refinement, transportation, importation, and exportation of oil and its by-products.² Petrobras S.A. (“Petrobras”), the Brazilian National Oil Company (“NOC”),³ was the sole agent to explore the Union’s monopoly. In 1995, the Brazilian government reformed the oil and gas regulatory framework. The Constitution was amended⁴ to authorize the Union to contract with any company incorporated and headquartered in Brazil to conduct the activities previously reserved only to Petrobras. It ended the oil and gas public monopoly in Brazil.

In 1997, Congress enacted the Oil Act,⁵ establishing the new regulatory framework and allowing competition in all segments of the oil and gas sector. The Oil Act also created the regulatory agency responsible to oversee the oil, gas, and biofuel activities, the National Petroleum Agency (“NPA”),⁶ and the National Energy Policy Council (“NEPC”) responsible for national energy public policy development.⁷ Among other tasks, the NPA is responsible for preparing the tender announcements and running the bidding processes for awarding exploration, development and production concessions, signing the agreements deriving therefrom, and overseeing their implementation.⁸ These duties are described in detail in Part II.A.3.

¹ Brazil is a federation divided into states. However, unlike the United States, the Union is a much stronger entity than the individual states because most legislation is enacted at the federal level and applicable to all states. Therefore, in Brazil, the states have no specific oil and gas exploration and production laws as these activities are regulated exclusively by the Union. *See also* CONSTITUIÇÃO FEDERAL [C.F.] [CONSTITUTION] art. 177 (Braz.), *available at* http://bd.camara.gov.br/bd/bitstream/handle/bdcamara/1344/constituicao_ingles_3ed.pdf.

² In fact, the public monopoly dates back to 1953 when Federal Act 2004/1953 established government control over oil and gas and incorporated Petrobras. Lei No. 2004, de 3 de Outubro de 1953, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 3.10.1953 (Braz.) (revoked), *available at* http://www.planalto.gov.br/ccivil_03/leis/L2004.htm.

³ *See infra* Part II.A.3.a.

⁴ CONSTITUIÇÃO FEDERAL [C.F.] [CONSTITUTION] amend. 9 (Braz.), *available at* http://bd.camara.gov.br/bd/bitstream/handle/bdcamara/1344/constituicao_ingles_3ed.pdf.

⁵ Lei No. 9,478, de 6 de Agosto de 1997, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 7.8.1997 (Braz.), *available at* http://www.planalto.gov.br/ccivil_03/leis/19478.htm.

⁶ *See id.* art. 7.

⁷ *See id.* art. 2.

⁸ *Id.* art. 8, § IV.

Ever since the end of the monopoly era, Brazil's oil and gas industry has steadily grown.⁹ In late 2006, Petrobras announced it had found evidence of ultra deep-water oil reserves beneath the underground salt layer ("pre-salt").¹⁰ The pre-salt layer extends along the Brazilian outer continental shelf at about 186 miles from the shoreline. The oil in the pre-salt is of good quality and is nestled in reservoirs at depths of 3.1 to 4.3 miles from the ocean surface, underneath a salt layer that may range from 656 to 6,561 feet, as shown in the tables below.

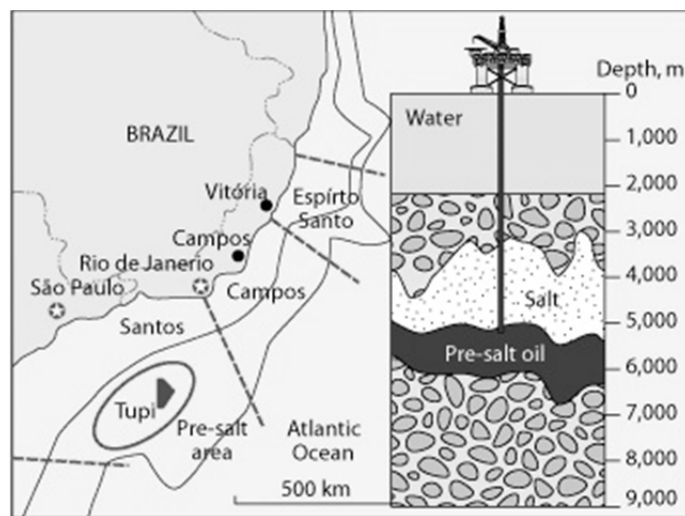


Figure 1

Image Courtesy of World Oil Online¹¹

The prospect of large reserves of oil in the pre-salt¹² with low exploratory risks (Petrobras' success rate in the pre-salt drilled wells was about 87%)¹³ raised discussion of whether concessions are the appropriate legal regime to govern the development of oil and gas in these locations. As a result, a new regulatory framework was designed to govern the exploration and

⁹ For details on production rate and proven reserves see *infra* Part II.A.2.

¹⁰ *Petrobras Anuncia Descoberta do Pré Sal*, BRASIL.GOV.BR, available at <http://www.brasil.gov.br/linhadotempo/epocas/2006/petrobras-anuncia-descoberta-do-pre-sal>.

¹¹ Peter Howard Wertheim & Dayse Abrantes, *South American Oil Economies Cope with International Slump*, WORLD OIL ONLINE (Jan. 2009), <http://www.worldoil.com/January-2009-South-American-oil-economies-cope-with-international-slump.html> (reporting the location of Brazil's pre-salt cluster in Figure 1).

¹² For estimates please see *infra* Part II.A.2.

¹³ Paulo César Ribeiro Lima, *O Novo Marco Legal Para O Pré-Sal Aprovado na Câmara dos Deputados*, in 28 COMUNICAÇÃO & POLÍTICA 147, 147 (2010), available at <http://www.cebela.org.br/site/baCMS/files/70634NCT4%20Paulo%20C%3%A9sar%20Ribeiro%20Lima.pdf>.

production of the oil discovered in the pre-salt area, and in 2010, Brazil adopted the production sharing agreement regime (“PSA”).¹⁴ Although it is not the main purpose of this Article to discuss the political and technical reasons that led Brazil to adopt its new regime, the low exploratory risk of the pre-salt is one reason commonly used to justify the PSA. The low exploratory risk means that drillers have very high chances of discovering commercial oil in the pre-salt. Still, exploratory risk is not the same as development risk, which involves extracting oil from ultra-deep reservoirs in extreme conditions not largely tested, risk which is considerably high in the case of the pre-salt.¹⁵ Details of this PSA regime are explained in Part II.A.4.

Consequently, Brazil now has a dual regulatory regime for oil and gas exploration and production: while the PSA governs exploration and production of the oil fields located in the pre-salt area as well as those considered strategic by a presidential decree, the concession regime governs all other fields. In fact, 28% of the pre-salt oil was already tendered under the concession regime before pre-salt oil fields were officially discovered.¹⁶ In order to comprehend the relevance of the pre-salt oil, the following Section provides an overview of oil production and reserves in Brazil.

2. Reserves and Production

As of 2011, Brazil’s proven oil reserves amount to 15.1 billion barrels (an increase of 0.9 billion barrels since 2010), which places the country in 14th position (former 15th) for the world largest oil reserves.¹⁷ In 2010, Brazil produced over 768.5 million barrels (representing an average annual increase of 4.2% in production), making it the 13th largest oil producer in the world.¹⁸

¹⁴ Lei No. 12,351, de 22 de Dezembro de 2010, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 23.12.2010 (Braz.), available at http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Lei/L12351.htm.

¹⁵ See *Brazil’s Oil Boom: Filling Up the Future*, ECONOMIST (Nov. 5, 2011), <http://www.economist.com/node/21536570> [hereinafter OIL BOOM]. In particular, extracting oil from ultra-deep reservoirs requires equipment designed to endure extreme high pressure and low temperatures, which is yet not fully available at a commercial level.

¹⁶ GOV’T OF BRAZ., NOVO MARCO REGULATÓRIO: PRÉ-SAL E AREAS ESTRATÉGICAS 4, available at http://www.mme.gov.br/mme/galerias/arquivos/pre_sal/marcoregulatorio.pdf (undated).

¹⁷ AGÊNCIA NACIONAL DO PETRÓLEO, GÁS NATURAL E BIOCMBUSTÍVEIS, ANUÁRIO ESTATÍSTICO BRASILEIRO DO PETRÓLEO, GÁS NATURAL E BIOCMBUSTÍVEIS 8, 24 (2012) [hereinafter ANPGNB 2012], available at <http://www.anp.gov.br/?pg=62402&m=&t1=&t2=&t3=&t4=&ar=&ps=&cachebust=1363716523347>; AGÊNCIA NACIONAL DO PETRÓLEO, GÁS NATURAL E BIOCMBUSTÍVEIS, ANUÁRIO ESTATÍSTICO BRASILEIRO DO PETRÓLEO, GÁS NATURAL E BIOCMBUSTÍVEIS 24 (2011), available at <http://www.anp.gov.br/?pg=62402&m=&t1=&t2=&t3=&t4=&ar=&ps=&cachebust=1363716523347>.

¹⁸ ANPGNB 2012, *supra* note 17, at 78.

Pre-salt oil discoveries can potentially aggregate about 50¹⁹ to 80²⁰ billion barrels of oil equivalent to Brazil's reserves, boosting Brazil to one of the top five oil producers by 2020.²¹ Indeed, 2011 was the first year of pre-salt oil production (pre-salt areas under the concession regime) and the results were promising: by the end of the year, Brazil produced 167,500 barrels per day of oil and 5.3 million cubic meters per day of gas, corresponding to 7.5% of the national production.²² These numbers point to the technical and commercial feasibility of exploration and production at ultra-deep waters. As demonstrated in the tables below, both reserves and production take place mainly off shore.

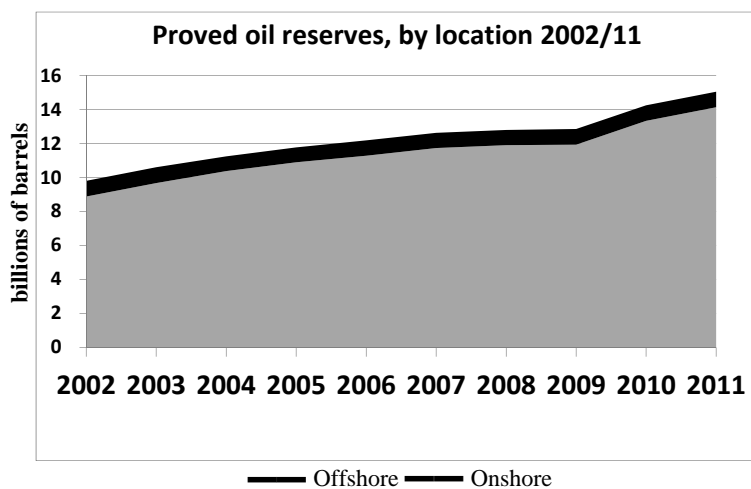


Figure 2

*Figure Courtesy of ANPGNB*²³

¹⁹ OIL BOOM, *supra* note 15.

²⁰ Cirilo Junior, *Blocos do Pré-sal têm até 80 Bi de Barris de Petróleo e Gás, diz ANP*, FOLHA DE S.PAULO (Nov. 7, 2008), <http://www1.folha.uol.com.br/folha/dinheiro/ult91u465318.shtml>.

²¹ OIL BOOM, *supra* note 15.

²² ANPGNB 2012, *supra* note 17, at 8.

²³ ANPGNB 2012, *supra* note 17, at 74 graph 2.1.

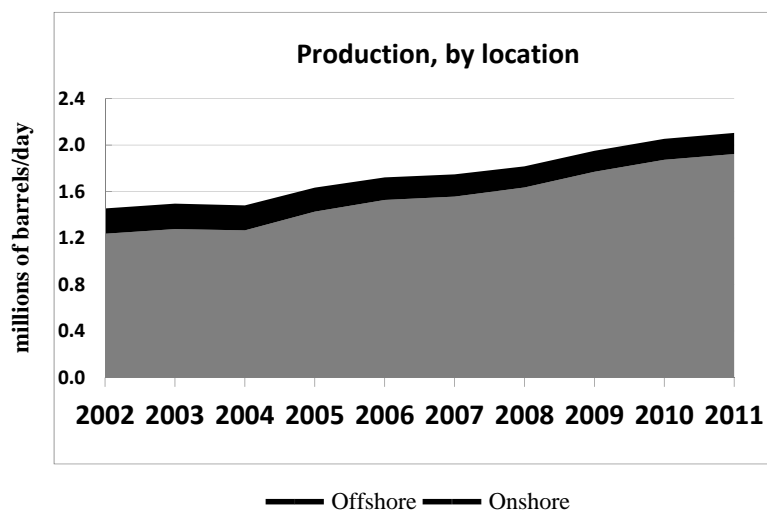


Figure 3

Figure Courtesy of ANPGNB²⁴

Brazil has twenty-nine sedimentary basins of hydrocarbon research interest, the equivalent of 7.5 million square kilometers (about 2.9 million square miles offshore).²⁵ But only a small percentage of these areas are currently under concession for exploration and production.

Given an overview of the production and reserves rates, the following Section provides a description of the concession regime main rules.

3. Concession Regime

The Oil Act provides that exploration and production of oil and gas in Brazil should be carried out under the concession regime.²⁶ After a bidding process, because the Union is the original holder of hydrocarbon rights, it grants to the winning oil company (“OC”) exclusivity to explore and produce

²⁴ ANPGNB 2012, *supra* note 17, at 74 graph 2.5.

²⁵ AGÊNCIA NACIONAL DE PETRÓLEO, *Brasil Está Entre as Mais Atraentes Oportunidades Exploratórias do Mundo*, (Mar. 19, 2013, 11:40 AM), available at <http://www.anp.gov.br/?pg=65095&m=bacias%20sedimentares&t1=&t2=bacias%20sedimentares&t3=&t4=&ar=0&ps=1&cachebust=1364486961012>.

²⁶ Originally, the Oil Act did not contemplate the PSA. It was only in 2010 that Lei No. 12,351 introduced the PSA regime in the legal framework. Lei No 12,351 amended the Oil Act, but it did not end the concession regime. Each regime is applicable according to the reserve location, as detailed below. See Lei No. 12,351, de 22 de Dezembro de 2010, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 23.12.2010 (Braz.), available at http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Lei/L12351.htm

hydrocarbons within a determined area.²⁷ The OC may participate in the bidding process individually or organized in consortium, usually comprised of both operating and non-operating members. Petrobras has been a major participant, but is subject to the same retaining conditions as private companies.

The concession agreement is signed between NPA and the OC. The OC may enter the agreement individually or in a consortium, according to the rules and limitations provided by the invitations to bid. The agreement usually lasts up to thirty-five years and is composed of an exploration phase and a production phase. The exploration phase lasts between three and eight years, a period during which the concessionaire must submit a Minimum Exploration Plan (“MEP”) for NPA’s approval.²⁸ The MEP is the bidder’s commitment to develop certain exploratory activities (measured in work unities), such as 2D/3D seismic activities and exploratory wells. As the execution of the MEP reveals, the concessionaire must gradually return to NPA the areas it is not interested in developing. The production phase can last up to twenty-seven years during which the concessionaire chooses areas it deems commercially viable and prepares a development plan.²⁹ The NPA is responsible for supervising the performance of the development plan by the concessionaire.

The exploration, development, production, and decommissioning activities are conducted at the concessionaire’s sole costs and risk. In return, the concessionaire becomes the owner of the hydrocarbons extracted, and it can dispose of these resources pursuant to the concession agreement and the law.

The concessionaire also has exclusive control of operations and holds both commercialization and exportation rights. It has the right to sell and export the oil produced subject only to two possible restrictions: (i) a national emergency declared by a presidential decree when oil and gas exportation may be limited by NPA;³⁰ (ii) the need of strategic reserves in the National System of Fuel Stock (created for shortage situations) that may adversely affect the oil supply.³¹ However, this has never happened in Brazil, and neither NEPC nor the Ministry of Mines and Energy have issued regulation regarding this topic.

²⁷ BAIN & CO. & TOZZINFREIRE ADVOGADOS, STUDIES OF REGULATORY, CORPORATE AND FINANCIAL ALTERNATIVES FOR THE EXPLORATION AND PRODUCTION OF OIL AND GAS AND THE INDUSTRIAL DEVELOPMENT OF THE OIL AND GAS PRODUCTION CHAIN IN BRAZIL 17 (2009), available at http://www.bain.com/bainweb/images/LocalOffices/BNDES_Consolidated_Report_BNDES_eng.pdf.

²⁸ Lei No. 9,478, art. 44, III, de 6 de Agosto de 1997, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 7.8.1997 (Braz.), available at http://www.planalto.gov.br/ccivil_03/leis/19478.htm.

²⁹ *Id.* art. 26 § 1.

³⁰ This provision is provided by the concession agreement.

³¹ The National System of Fuel Stock was created by Lei No. 8.176 de 8 de Fevereiro de 1991, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 13.2.1991 (Braz.), available at http://www.planalto.gov.br/ccivil_03/leis/L8176.htm#art4 and is regulated by Decreto No. 238, de 24 de Outubro de 1991, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 25.10.1991 (Braz.), available at http://www.planalto.gov.br/ccivil_03/decreto/1990-1994/D238.htm.

Finally, the government take consists of a signature bonus,³² royalties,³³ special participation,³⁴ occupation and land retention fee, and general taxes (income, profit, social security). The following Section details the process of granting oil and gas exploration and production rights in Brazil, the so-called “Brazilian Rounds.”

a. The Granting of Exploration and Production Rights:
Brazilian Rounds

The bidding process is conducted by the NPA through public tenders called Brazilian rounds. Since 1999, NPA has conducted ten rounds,³⁵ and the eleventh was officially announced on January 24, 2013. The eleventh round

³² See *infra* Part II.A.3.a for further details on the signature bonus.

³³ Usually 10% as provided by the Oil Act. Lei No. 9,478, art 47, de 6 de Agosto de 1997, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 7.8.1997 (Braz.), available at http://www.planalto.gov.br/ccivil_03/leis/19478.htm. According to the Oil Act, this amount may be reduced to a minimum of 5% depending on NPA’s assessment of the geological risk involved and production expectations. *Id.* art. 47 § 1. Under the concession regime, royalty’s income is distributed among the federation under the following (simplified version of the) rule: the Union is entitled to 40% while the states and municipalities where production takes place (when offshore, the projection on their territories limits towards the ocean is considered) retain 22.5% and 30% of the royalties, respectively. The remaining 7.5% is distributed equally among all other states and municipalities. *Id.* art. 49. This rule has recently been partially revoked by the Federal Act. See Lei No. 12,734 de 30 de Novembro de 2012, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 30.11.2012 (Braz.), available at http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12734.htm. This new Act changed the royalties’ distribution rule (under the concession regime) to reduce the share of the states and municipalities where production takes place and increase the others’ share: the Union is now entitled to 20%, the states and municipalities where production takes place retains 20% and 15% (with an annual decreasing curve), respectively, and the remaining is distributed among the others states and municipalities (with an annual increasing curve). *Id.* art. 42-B. The Act, however, is currently under heavy political pressure and it was partially vetoed by the president in order to be applicable only to concession contracts signed after December 3, 2012 (thus maintaining the older distribution rule to the contracts signed before December 3, 2012). Mensagem No. 522 de 30 de Novembro de 2012, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 30.11.2012, rectified on 05.03.2013 (Braz.). Congress overruled the veto on March 7, 2013, but on March 18 the Supreme Court issued a preliminary injunction halting the effectiveness of Lei No. 12,734 (Ação Direta de Inconstitucionalidade No. 4917), rendering ineffective the veto overrule. On March 25, Congress filed a motion to overrule the Supreme Court’s decision, which was not yet decided by the time this Article was printed.

³⁴ This means a special payment is due in case of large volumes of oil and gas or high profitability, as provided by article 50 of the Oil Act. The payment varies in accordance with how long the field is producing, the volumes produced, and place of operations (onshore, offshore, shallow/deep waters), as established in Decreto No. 2.705, de 3 de Agosto de 1998, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 30.11.2012 (Braz.), available at http://www.planalto.gov.br/ccivil_03/decreto/D2705.htm.

³⁵ The tenth round was conducted in 2008 and the halt is majorly due to an intricate dispute over the royalties’ distribution among the Union, states, and municipalities. See sources cited *supra* note 33 and accompanying text.

will offer 289 blocks, totaling 96,809 square miles, distributed in eleven sedimentary basins.³⁶ The public tender is expected to be conducted on the 14th and 15th of May 2013.

As of the end of 2011, 736 areas were under concession, the majority of which were in production phase.³⁷ Each round must be initially authorized by the NEPC. The next step is the determination by the NPA of the fields that will be tendered in the proceeding. Once the tendering fields are defined, the round is publicly announced and the invitation to bid and the draft of the concession agreement are published for public analysis. This step is followed by a public hearing, a sequence of technical and legal debates that result in the publication of the final versions of both the invitation to bid and the concession agreement.³⁸ Then the period starts for bidders to file their qualification documents. After this phase is over, bidders (individually or organized in consortiums) present their offers, and the NPA conducts the bid auction.

The selection usually includes three criteria: (i) a signature bonus; (ii) local content; and (iii) the analysis of the MEP.³⁹ A signature bonus is the amount of money offered by the bidder to explore and produce the field, paid when the concession agreement is signed, and the local content represents the bidder's commitment to contract a minimum percentage of goods and services with Brazilian companies. On one hand, the local content requirement has been targeted as an inhibitor of oil development in Brazil due to the challenges in complying with this regulation. A study prepared for the Brazilian National Petroleum Industry Organization ("ONIP"), found that Brazilian producers in the oil services industry charge 55% more than their international competitors, thus hampering efficiency and competition.⁴⁰ On the other hand, the NPA maintains that the local content requirement fosters the development of local suppliers and technology resulting in higher employment rates and income growth.

³⁶ See Agência Nacional do Petróleo, Gás Natural e Biocombustíveis, *Superintendência de Promoções de Licitações—SPL*, BRASIL 11^a RODADA, http://www.brasil-rounds.gov.br/round11/portugues_r11/areas_oferecidas.asp (last visited Mar. 19, 2013).

³⁷ ANPGNB 2012, *supra* note 17, at 57.

³⁸ For an English version of the invitation to bid and concession agreement of the tenth round, see, *Final Tender Protocol and Contract*, BRASIL 10^a RODADA, <http://www.anp.gov.br/brnd/round10/ingles/edital.asp> (last visited Mar. 19, 2013).

³⁹ AGÊNCIA NACIONAL DO PETRÓLEO, GÁS NATURAL E BIOCOMBUSTÍVEIS, FINAL TENDER PROTOCOL FOR THE GRANTING OF CONCESSION AGREEMENTS (2008), *available at* <http://www.anp.gov.br/brnd/round10/arquivos/editais/ft%20Protocol%20R10%20Final%20versi%20on.pdf>. In the tenth round these criteria were weighted as follow: (i) signature bonus (40%); (ii) local content (20%); and (iii) minimum working program (40%). *Id.* at 33, 38–39.

⁴⁰ BOOZ & CO., COMPETITIVE AGENDA FOR OFFSHORE OIL AND GAS SUPPLY CHAIN IN BRAZIL 69 (2011), *available at* <http://novosite.onip.org.br/wp-content/uploads/2011/07/English-version-final.pdf>.

After explaining the main characteristics of the concession regime, the following Section describes Brazil's regulatory framework applicable to pre-salt areas: the production sharing agreement.

4. Production Sharing Agreement⁴¹

The main characteristic of the PSA is that it inverts the concession logic of exploited hydrocarbons ownership. Instead of being owned by the OC that drilled it, the extracted oil still belongs to the government.⁴²

In the PSA—as in the concession regime—the government provides exclusivity of the tendered area to the bid winner (hereinafter “consortium”).⁴³ The consortium shall also explore the field and produce the oil at its own risk and cost. When the field is found to be commercially viable, the consortium is entitled to receive a share of the produced oil for the purpose of reimbursing its exploration and production costs — the so-called *cost oil*.⁴⁴ The remaining oil—the so-called *profit oil*—is shared between the government and the consortium according to the terms of the production sharing agreement.⁴⁵ Thus, under the PSA, the government take is paid through its share of profit oil as well the payment of a signature bonus⁴⁶ and royalties.⁴⁷

⁴¹ Lei No. 12,351, art. 3, de 22 de Dezembro de 2010, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 23.12.2010 (Braz.), available at http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Lei/L12351.htm.

⁴² From an economic perspective, “[t]he most marked difference between concession . . . [and PSA] is that reserves and production do not vary in response to oil price movements for concession fields, while both production and reserves vary under PSC regimes. . . . When oil prices rise the number of barrels of oil needed to pay for the [OC] costs [cost oil] and profits [profit oil] are reduced.” See Petter Osmundsen, *Chasing Reserves—Incentives and Ownership*, 2.1 (U.S. Ass’n for Energy Econ., Int’l Ass’n for Energy Econ. Working Paper, USAEE WP 09-025 (2009)), available at <http://ssrn.com/abstract=1517154>.

⁴³ Because Petrobras has a mandatory participation in exploration and production under this regime (as explained below), the bid winner will always be a consortium formed by the private parties participating in the tender and Petrobras. The specific rules and limitations in forming the consortium are set forth in the invitations to bid.

⁴⁴ Lei No. 12,351, art. 2º, II, de 22 de Dezembro de 2010, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 23.12.2010 (Braz.), available at http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Lei/L12351.htm.

⁴⁵ A minimum percentage (yet to be defined) of profit oil must be guaranteed to the Brazilian government. *Id.* art. 10, II, b.

⁴⁶ Lei No. 12,351, art. 42, I, de 22 de Dezembro de 2010, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 23.12.2010 (Braz.), available at http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Lei/L12351.htm. The signature bonus is not included in the cost oil and must be paid when the parties signed the agreement.

⁴⁷ *Id.* art. 42, II. The royalties are also not included in the cost oil and its distribution under the PSA regime was also regulated by the Federal Act. See Lei No. 12,734, art. 2 § 1, de 30 de Novembro de 2012, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 30.11.2012 (Braz.), available

In 2010, Brazil incorporated *Petróleo e Gás Natural S.A.* (“PPSA”), a 100% government-owned company, to be responsible for managing the production sharing agreements and the sale of the government’s share of oil output.⁴⁸ PPSA represents the Union in the production sharing agreement and in the unitization⁴⁹ process but has no responsibility over exploration and production activities. Although PPSA bears no entrepreneurial risk, it has mandatory participation in all consortiums formed to explore and produce oil in the pre-salt as well as the right to nominate the majority of the operational committee,⁵⁰ including its president who has a tie-breaking vote.⁵¹

The Brazilian PSA regime also contemplates a relevant role for Petrobras as the sole operator of the oil fields. The other parties may only participate as non-operators, according to the terms and limitations set forth in the invitations to bid. Further, as a legal requirement, Petrobras must hold a

at http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12734.htm. Under the PSA regime, the Union is entitled to 22% of the royalties income, which must go to the Social Fund, see *supra* Part II.A.3, while the states and municipalities where production takes place (when offshore, the projection on their territories limits towards the ocean is considered) retains 22% and 5% of the royalties, respectively. Lei No. 12,734, art. 42-A, de 30 de Novembro de 2012, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 30.11.2012 (Braz.), available at http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12734.htm, . The remaining is distributed equally among all other states and municipalities. The logic of paying royalties to the states and municipalities where the production takes place offshore was questioned because the pre-salt exploration is conducted far from the coast shore with almost no impact to these locations. The underlying idea of compensating the states and municipalities where the production takes place for the burden of hosting these activities makes less sense under the PSA than it did under the concession regime.

⁴⁸ Lei No. 12,304, art. 1, de 2 de Agosto de 2010, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 3.8.2010 (Braz.), available at http://www.planalto.gov.br/ccivil_03/Ato2007-2010/2010/Lei/L12304.htm.

⁴⁹ Unitization is an agreement between the government and the OC (or consortium) that tenders an oil field that actually extends beyond the tendered area. The NPA is responsible for ratifying these agreements. Until 2010, unitization was regulated by article 27 of the Oil Act, which was revoked when the PSA regime was enacted. See Lei No. 12,351, art. 67, de 22 de Dezembro de 2010, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 23.12.2010 (Braz.), available at http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Lei/L12351.htm. Currently there is a public hearing process being conduct by NPA to discuss unitization regulation. All the documents related to this hearing are available at *Consultas e Audiências Públicas em Andamento*, AGÊNCIA NACIONAL DO PETRÓLEO, GÁS NATURAL E BIOCOMBUSTÍVEIS, <http://www.anp.gov.br/?pg=65066> (last visited Apr. 24, 2013).

⁵⁰ The operational committee is a mandatory body in every consortium and is responsible, among other things, for the definition of the exploration plan, the declaration of commercial viability of each reserve and the approval of the consortium’s annual budget for the exploration and production activities. Lei No. 12,351, art. 23, de 22 de Dezembro de 2010, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 23.12.2010 (Braz.), available at http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Lei/L12351.htm.

⁵¹ *Id.* art. 25.

share of at least 30% of each field tendered,⁵² which means that just as with PPSA, Petrobras has mandatory participation in all consortiums formed to explore and produce oil (as the sole operator). Petrobras may also be directly retained (no public procurement procedure required) by the Union to explore and produce certain oil fields,⁵³ in which case it would hold 100% of the field interest, as no private party is allowed to be retained without a previous public tender procedure. If not directly retained, Petrobras may participate with the other parties in the tender procedure to increase its 30% mandatory share. Finally, Petrobras may also act as the Union's agent in the disposition of the government's share of profit oil through refining and sale.

The award of exploration and production rights must be preceded by a public tender procedure.⁵⁴ However, as opposed to the concession regime, the President, upon CNEP proposal, defines the tendering fields under the PSA regime. Selection of the best bid will be based on the highest offer of profit oil for the government.⁵⁵ Income resulting from the sale of *profit oil*, a share of the signature bonus, and the Union's share of royalties⁵⁶ will be deposited in the Social Fund, a sovereign fund whose resources will be used by the Union to finance projects fostering education, culture, science and technology, environmental sustainability development, and the reduction of poverty in Brazil.⁵⁷

Finally, it should be pointed out that Brazil has never yet conducted a public tender for the pre-salt oil, so the PSA has not been tested. The first round was expected in 2011, but it was postponed, mostly due to the pending controversy over the royalty division.⁵⁸ Now it is expected to happen in late November 2013.⁵⁹

B. *American Leasing*

The previous Sections described the Brazilian dual regime with its main characteristics, the role of the regulatory agencies and the process of

⁵² *Id.* art. 10 § III(c).

⁵³ *Id.* arts. 8, I & 12 (stating that Petrobras can be directly retained to pursue the national interest and to achieve energy policy goals).

⁵⁴ *Id.* arts. 8, II. *But see* text accompanying *supra* note 53).

⁵⁵ *Id.* art. 18.

⁵⁶ *See* text accompanying *supra* note 47 (discussing royalties).

⁵⁷ Lei No. 12,351, art. 47, de 22 de Dezembro de 2010, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 23.12.2010 (Braz.), *available at* http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Lei/L12351.htm.

⁵⁸ *See* sources cited *supra* notes 33 and 47 and accompanying text.

⁵⁹ *See* Memorandum from Mattos Filho, Veiga Filho, Marrey Jr e Quiroga Advogados to Clients (Jan. 11, 2013), *available at* <http://www.mattosfilho.com.br/pagina.php?item=Memos&pag=5371&lang=en>.

granting exploration and production rights. The following Sections mirror this effort for the American regulatory framework.

1. Overview

American leasing of oil and gas is also considered a concession regime, with its own peculiarities. Regulation of exploration and production depends on whether the leased area is under state or federal jurisdiction. Aside from their own territory, the states have jurisdiction over areas up to three miles from the coast shore⁶⁰ while the federal government has power over its own onshore lands⁶¹ and the offshore areas outside the state reach, including the outer continental shelf up to a distance recognized by international law (for the most part 200 miles).⁶²

While each state has its own regulatory body, U.S. federal regulation is conducted onshore by the Bureau of Land Management (“BLM”), on Indian lands by the Bureau of Indian Affairs (“BIA”), and offshore by three agencies: (i) the Bureau of Safety and Environmental Enforcement (“BSEE”), which is responsible for safety issues, environment protection, and offshore resources conservation; (ii) the Bureau of Ocean Energy Management (“BOEM”), which manages exploration and development of offshore resources; and (iii) the Office of Natural Resources Revenue (“ONRR”), which is responsible for collecting revenue from mineral leases covering federal lands.

The distinctive feature of the American regime is that hydrocarbons are often privately owned. Unless separated by a deed or other agreement, hydrocarbon rights are owned by the surface owner⁶³ and can be traded as other real estate property. Although oil and gas laws vary by state, the laws regarding ownership prior to, at, and after extraction are quite standardized in the United States. Currently, transactions involving privately owned minerals dominate, and only 30% of United States mineral rights are located in federal lands.⁶⁴

Due to the fluid nature of hydrocarbons, the common law rule of ownership under which rights extend vertically downward from the property line—the “*ad coelum*” doctrine, whereby the property owner has the right to own everything from the heavens above the surface of his land to the core of the earth beneath it⁶⁵—was not appropriate to govern the extraction of petroleum. Thus, the rule of capture doctrine was developed to modify the *ad coelum* doctrine albeit with its own inherent limitations and restrictions

⁶⁰ U.S. Submerged Lands Act, 43 U.S.C. § 1301(b) (2006).

⁶¹ See, e.g., The Mineral Leasing Act, 30 U.S.C. § 181 (2006).

⁶² See Outer Continental Shelf Lands Act, 43 U.S.C. § 1331(a), (e) (2006).

⁶³ Offshore oil is owned by the state or federal government according to its location. *Id.*

⁶⁴ JOHN S. LOWE, OIL AND GAS LAW IN A NUTSHELL 8 (5th ed. 2003).

⁶⁵ JOSEPH P. TOMAIN & RICHARD D CUDAHY, ENERGY LAW IN A NUTSHELL 224 (2d ed. 2011).

provided by the doctrine of correlative rights and conservation laws. This discussion is detailed in Part III.A.1.

After this overview, the following Section provides information on the United States reserves and production rates demonstrating the global relevance of the country.

2. Reserves and Production

The United States has the twelfth largest proven oil reserves in the world with 30.9 billion barrels as of 2011 (a steady amount since 2009).⁶⁶ It is also the 3rd largest oil producer with a production of 7,841 million barrels per day (2011 estimate).⁶⁷ As of 2010, all federal acreage, “both onshore and offshore, [held] more than 2,000 trillion cubic feet of natural gas (about seventy-five years’ worth of current domestic consumption) and 229 billion barrels of oil (about fifty years’ worth).”⁶⁸

The United States also has a Strategic Petroleum Reserve (“SPR”), an emergency storage of oil maintained by the U.S. Department of Energy. The SPR is a complex of four sites with deep underground storage caverns created in salt domes along the Texas and Louisiana Gulf Coasts with investments of about \$22 billion to date (\$5 billion for facilities; \$17 billion for crude oil).⁶⁹ At its completion, SPR held 727 million barrels of oil, the largest stockpile of government-owned emergency crude oil in the world.⁷⁰ The SPR was created in the aftermath of the 1973–74 oil embargo to provide security in case of disruptions. The Energy Policy Act of 2005⁷¹ directed the Secretary of Energy to fill the SPR to its authorized one billion barrel capacity.⁷²

Full drawdowns and sale of petroleum products from the SPR may only be made if “the President has found that drawdown and sale are required by a severe energy supply interruption or by obligations of the United States

⁶⁶ ANPGNB 2012, *supra* note 17, at 25.

⁶⁷ *Id.* at 29.

⁶⁸ Christopher Helman, *Study: Fed Lands Hold Oil and Gas Bonanza*, FORBES (Feb. 15, 2010, 2:53 PM), <http://www.forbes.com/sites/energysource/2010/02/15/study-fed-lands-hold-oil-and-gas-bonanza/>.

⁶⁹ *SPR Facts & Frequent Questions*, U.S. DEP’T OF ENERGY, <http://www.fossil.energy.gov/programs/reserves/spr/spr-facts.html> (last updated Feb. 22, 2013).

⁷⁰ *Petroleum Reserves*, U.S. DEP’T OF ENERGY, <http://www.fe.doe.gov/programs/reserves/index.html> (last updated Mar. 19, 2013) (“During July and August 2011, inventory was reduced to 695.9 million barrels after 30.59 million barrels were sold in response to sustained interruptions in global supplies due to civil unrest in Libya.”).

⁷¹ Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (codified as amended in scattered sections of 42 U.S.C.).

⁷² 42 U.S.C. § 6240(e) (repealed 2000).

under the international energy program.”⁷³ In these cases, the Secretary shall sell the petroleum products at public sale to the highest qualified bidder.⁷⁴ Limited drawdowns may take place

[i]f the President finds that—(A) a circumstance, other than those described in subsection (d) of this section, exists that constitutes, or is likely to become, a domestic or international energy supply shortage of significant scope or duration; (B) action taken under this subsection would assist directly and significantly in preventing or reducing the adverse impact of such shortage; and (C) the Secretary of Defense has found that action taken under this subsection will not impair national security.⁷⁵

Finally, the Secretary is authorized to carry out test drawdown and sale or exchange of petroleum products from the SPR provided that “[s]uch a test drawdown and sale or exchange may not exceed 5,000,000 barrels of petroleum products.”⁷⁶ Exchanges have been used in the past to replace less suitable grades of crude oil with higher-quality crudes and for limited, short-duration actions to assist petroleum companies in resolving oil delivery problems.⁷⁷

Given an overview of the production and reserves rates as well as the role of the SPR, the following Section provides a description of the leasing regime’s main rules.

⁷³ 42 U.S.C. § 6241(d)(1) (2006).

⁷⁴ *Id.* § 6241(e)(1).

⁷⁵ 42 U.S.C. § 6241(h)(1)(A)–(C). Limited drawdowns are further restricted as follows:

Petroleum products from the Reserve may not be drawn down under this subsection—(A) in excess of an aggregate of 30,000,000 barrels with respect to each such shortage; (B) for more than 60 days with respect to each such shortage; (C) if there are fewer than 500,000,000 barrels of petroleum product stored in the Reserve; or (D) below the level of an aggregate of 500,000,000 barrels of petroleum product stored in the Reserve.

Id. § 6241(h)(2)(A)–(D).

⁷⁶ *Id.* § 6241 (g)(1).

⁷⁷

In 2000, crude oil from the Reserve was exchanged for storage capacity and stocks to create the Northeast Heating Oil Reserve. During Fall 2005, an exchange was conducted at the request of refineries in the Gulf Region when Hurricane Katrina caused disruptions to scheduled deliveries. During 2006, small exchanges occurred in January and June when accidents in shipping channels disrupted marine deliveries to refiners. In 2008, test exchange authority was used to provide crude oil to industry after Hurricanes Gustav and Ike shut down Gulf production and marine deliveries along the Gulf Coast. Short-term, discrete time exchanges are sometimes referred to as loans.

SPR Facts & Frequent Questions, *supra* note 69.

3. Lease Agreement

American leasing of oil and gas is formalized in a lease agreement. A “[l]ease means any contract, profit-share arrangement, joint venture, or other agreement issued or approved by the United States under a mineral leasing law that authorizes exploration for, extraction of, or removal of oil or gas.”⁷⁸ The lessor may be the government or a private party, depending on the ownership status of the area where the leased field is located. The lessee is an OC or a consortium formed by two or more companies interested in the exploration and production of the oil and gas. The terms of the lease govern the activities, duties, and rights of the lessees and the lessor. Federal and state regulations govern the protection of the environment, safety issues, and other matters. Leases that are negotiated between private parties may follow widely used forms or may contain terms and conditions specific to the given lease.

Commonly, the lessee is granted the right to develop the leased land for an agreed term albeit without any obligation to do so. If production is obtained, the lessee has the right to maintain the lease for as long as production is economically feasible.⁷⁹ As a type of concession, the hydrocarbons become the lessee’s property once they are extracted. Likewise the lessee bears all the costs and risks related to exploration and development activities.

Similarly to the concession agreement, oil and gas leases are typically divided into two phases in the so-called *habendum* clause.⁸⁰ The clause provides for a primary term that usually lasts “from one year for proven reserves to [ten] years for undeveloped areas,” and a conditional secondary term tied to the production life of the field(s) contemplated by the agreement.⁸¹ During the first term, the lessee does not have the obligation to drill, as it will use this period to conduct geophysical and geological tests in the area to assess location characteristics. The condition of the secondary term is the production of oil or gas: if the lessee has not started producing after the first term, the lease may expire.⁸² In some cases, the agreement may not require production to extend the lease into the secondary term, but in such an event the lease usually imposes other requirements, such as drilling test wells or payment of a delay rental.

Payments to the lessor typically take three forms: bonus, delay rentals, and royalties. The bonus is an up-front payment to the lessor in compensation for the lessee’s right to drill. Like in Brazil, where the signature bonus is also a payment made by the bid winner when it signs the concessions agreement, here

⁷⁸ 43 C.F.R. § 3160.0-5 (2012).

⁷⁹ LOWE, *supra* note 64, at 169.

⁸⁰ *Id.* at 192.

⁸¹ CHARLES CALDWELL ET AL., OIL REGULATION IN 28 JURISDICTIONS WORLDWIDE 145, 147 (2009).

⁸² *See id.*

the same applies. However, unlike in Brazil, where the bonus is always a government take, in the United States the bonus is owned to the lessor, no matter if a private party or not. The delay rentals are fees paid to the lessor, usually on an annual basis, until such time as the property begins producing oil or gas in commercial quantities. As the name suggests, this allows for delays in production or commencement of drilling without terminating the lease. Lastly, the royalty is paid to the lessor as a compensation for the exploration of oil and gas. Due to the hydrocarbons ownership rule, the government only receives royalties if production and exploration takes place on public property.

Because there is a plurality of players who account as lessors, the lease agreement may be negotiated both directly or preceded by a public tender procedure. When the lessor is a private party, the lease is usually negotiated directly. Each state will be responsible for granting leases in their respective lands, as well as offshore areas located within three miles of the coast.

If the oil field is located onshore in federal lands, the lease is granted by the BLM and regulated by the Mineral Leasing Act.⁸³ In this case, the lease conveys to the lessee the right to develop resources in the leased area. Prior to conducting any surface-disturbing activities, the lessee will have to obtain BLM's approval. Federal lands cannot be leased until they are first offered competitively at an oral auction.⁸⁴ The competitive bid can be initiated by the BLM, or by an interested party who can request that specific lands be offered competitively by filing an expression of interest ("EOI"),⁸⁵ or a noncompetitive "presale" lease offer, which is a formal nomination for lands to be offered competitively.⁸⁶ The winner is the "highest oral bid made by a qualified bidder, equal to or exceeding the national minimum acceptable bid."⁸⁷ Lands that have been offered competitively and received no bids shall be available for leasing noncompetitively for two years through the filing of a "Postsale" Lease Offer.⁸⁸ Oil and gas leases granted by the BLM expire at the end of their ten-year term for competitive or noncompetitive leases, which may be extended if diligent drilling operations are in progress, or in case the lease contains a well capable

⁸³ Federal Regulations governing oil and gas leasing can be found at 43 C.F.R. §§ 3000–3195 (2012).

⁸⁴ 43 C.F.R. § 3120.1-1(2012).

⁸⁵ For more details on the EOI, see *Colorado: Expressions of Interest*, U.S. DEP'T OF THE INTERIOR, http://www.blm.gov/co/st/en/BLM_Programs/oilandgas/expressions_of_interest.html (last updated Mar. 6, 2013).

⁸⁶ For more details on the noncompetitive "presale" lease offer requirements and implications see *Idaho: Noncompetitive Oil and Gas Lease Offers*, U.S. DEP'T OF THE INTERIOR, http://www.blm.gov/id/st/en/prog/energy___minerals/energy/oil_and_gas0/noncompetitive_oil0.html (last visited Mar. 7, 2013).

⁸⁷ 43 C.F.R. § 3120.5-1(b).

⁸⁸ 43 C.F.R. § 3110.1(b).

of producing oil or gas in paying quantities. Rental and royalties are paid to the Office of Natural Resources Revenue.⁸⁹

The tribes in Indian lands, subject to the approval of the Secretary of Interior, may enter into any joint venture, operating, production sharing, service, managerial, lease or other agreement, providing (i) for the development of natural resources, including oil and gas, in which such Indian tribe owns an interest; or (ii) for the sale or other disposition of such resources.⁹⁰ The issuance of leases within these areas is conducted by the BIA in coordination with the BLM. BIA allows for direct negotiations that are in the best interest of the tribes.⁹¹

In federally-owned offshore fields, the BOEM is responsible for developing a Five Year Leasing Program specifying the size, time, and location of federal areas that will be available for lease.⁹² Offshore leases are governed by the Outer Continental Shelf Lands Act and are offered competitively to the highest bid in a public tender.⁹³ The process is complex and makes an effort to balance different interests as they affect natural resources and the environment. It starts with the nomination of potential producers, identification of the area to be explored and the draft of a final environmental impact statement (“EIS”) pursuant to the National Environmental Policy Act.⁹⁴ Following the publication of the final EIS the Notice of Proposed Sale is issued with a notice on the bidding procedure.⁹⁵ The bidding is conducted by sealed bid and, at the discretion of the Secretary of Interior, may be based on a variety of criteria such as cash bonus with a fixed royalty, a royalty bid with a determined cash bonus or various combinations of them, which also includes parameters such as work commitment and share of net profits.⁹⁶ The Secretary

⁸⁹ 30 CFR § 1218.50 and § 1218.100.

⁹⁰ 25 U.S.C. § 2102(a) (2006).

⁹¹ *Id.* § 2102(b).

⁹² The current Five Year Leasing Program is the OCS Oil & Gas Leasing Program for 2012–2017, which went into effect on August 27, 2012, and will expire on August 26, 2017. *See Five Year Outer Continental Shelf (OCS) Oil and Gas Leasing Program*, BUREAU OF OCEAN ENERGY MGMT., <http://www.boem.gov/5-year/2012-2017> (last visited Mar. 19, 2013).

⁹³ *See* 43 U.S.C. § 1337 (2006).

⁹⁴ *See generally* 42 U.S.C. §§ 4321–4370f (2006).

⁹⁵ TOMAIN & CUDAHY, *supra* note 65, at 257.

⁹⁶ Examples of others criteria are:

(A) cash bonus bid with a royalty at not less than [12.5] per centum fixed by the Secretary of Interior in amount or value of the production saved, removed, or sold; (B) variable royalty bid based on a per centum in amount or value of the production saved, removed, or sold, with either a fixed work commitment based on dollar amount for exploration or a fixed cash bonus as determined by the Secretary of Interior, or both; (C) cash bonus bid, or work commitment bid based on a dollar amount for exploration with a fixed cash bonus, and a diminishing or sliding royalty based on such formulae as the Secretary of Interior shall determine as equitable to encourage continued

of Interior may also increase, reduce, or eliminate royalties or net profit shares at its own discretion to induce the production of a leased area.⁹⁷ The bidding system aims to balance a range of concerns—from economic to social and environmental as well as to ensure the government's fair market price.⁹⁸ As detailed in a House of Representatives Conference Report,

in utilizing the new bidding alternatives, a variety of considerations should be taken into account, including but not limited to: (i) providing a fair return to the Federal Government; (ii) increasing competition; (iii) assuring competent and safe operations; (iv) avoiding undue speculation; (v) avoiding unnecessary delays in exploration, development, and production; (vi) discovering and recovering oil and gas; (vii) developing new oil and gas resources in an efficient and timely manner; and (viii) limiting administrative burdens on government and industry.⁹⁹

These concerns demonstrate how different interests are assembled together in the bidding system.

After this overview of both the Brazilian and American legal regimes for the exploration and production of oil and gas, Part III aims to analyze in more detail some comparative aspects of each regulatory framework.

production from the lease area as resources diminish, but not less than [12.5] per centum at the beginning of the lease period in amount or value of the production saved, removed, or sold; (D) cash bonus bid with a fixed share of the net profits of no less than 30 per centum to be derived from the production of oil and gas from the lease area; (E) fixed cash bonus with the net profit share reserved as the bid variable; (F) cash bonus bid with a royalty at no less than [12.5] per centum fixed by the Secretary of Interior in amount or value of the production saved, removed, or sold and a fixed per centum share of net profits of no less than 30 per centum to be derived from the production of oil and gas from the lease area; (G) work commitment bid based on a dollar amount for exploration with a fixed cash bonus and a fixed royalty in amount or value of the production saved, removed, or sold; (H) cash bonus bid with royalty at no less than 12 and [0.5] per centum fixed by the Secretary of Interior in amount or value of production saved, removed, or sold, and with suspension of royalties for a period, volume, or value of production determined by the Secretary of Interior, which suspensions may vary based on the price of production from the lease; or (I) subject to certain requirements provided by paragraph (4) of [43 U.S.C. § 1337], any modification of bidding systems authorized in subsections (A) through (G), or any other systems of bid variables, terms, and conditions which the Secretary of Interior determines to be useful to accomplish the purposes and policies of [43 U.S.C. § 1337], except that no such bidding system or modification shall have more than one bid variable.

43 U.S.C. § 1337(a)(1)(A)–(I).

⁹⁷ 43 U.S.C. § 1337(a)(3)(A).

⁹⁸ *Watt v. Energy Action Educ. Found.*, 454 U.S. 151, 213–14 (1981).

⁹⁹ H.R. REP. NO. 91474, at 92 (1978) (Conf. Rep.).

III. COMPARATIVE ANALYSIS OF SELECTED TOPICS

This Part selects two topics—hydrocarbons ownership and oil companies—to discuss in more depth the comparative approach of both Brazil and the United States to them. Overall, this Part seeks to reveal the origins and consequences of public versus private ownership of hydrocarbons as well as the differences and roles of national versus international oil companies.

A. *Hydrocarbons Ownership*

A relevant difference between the Brazilian and American regimes lies in the ownership of hydrocarbons *in situ*. While Brazil has historically affirmed its ownership over natural resources that are in the ground, the United States adopts private ownership as the rule. The Brazilian approach is the most common worldwide, as most countries retain ownership of valuable natural resources.¹⁰⁰ The American rule, on the contrary, evolved from the common law *ad coelum* doctrine.¹⁰¹ However, as explained below, the *ad coelum* doctrine was not an adequate approach to dealing with ownership of oil and gas resources.

1. The Rule of Capture

Early in the history of United States oil and gas development, it became clear that the *ad coelum* doctrine was suitable to deal with solid minerals but would be inappropriate to manage fluid resources like oil and gas. Hydrocarbons are fugacious (they tend to escape) and move around within a reservoir without respect to property boundaries, in such a way that absolute ownership ceases when oil and gas migrates.¹⁰² If the *ad coelum* doctrine were adopted to govern oil and gas extraction, the industry would likely be discouraged by the imminent liabilities of drilling resources on a neighbor's land. Thus, the rule of capture was developed in the late nineteenth century to transform the *ad coelum* doctrine and provide a more suitable legal framework to deal with the exploration of oil and gas.¹⁰³

The seminal decision in this respect was the 1889 Supreme Court of Pennsylvania case of *Westmoreland and Cambria Natural Gas Co. v. DeWitt*,¹⁰⁴ which stated that

¹⁰⁰ LOWE, *supra* note 64, at 8.

¹⁰¹ See *supra* Part II.B.1.

¹⁰² Bryan Clark, *Migratory Things on Land: Property Rights and a Law of Capture*, 6.3 EJCL, § 5.3.1 (Oct. 2002), available at http://www.ejcl.org/63/art63-3.html#N_1_.

¹⁰³ LOWE, *supra* note 64, at 9–10.

¹⁰⁴ 18 A. 724 (Pa. 1889).

[u]nlike other minerals, [water, oil, and gas] have the power and the tendency to escape without the volition of the owner. "Their fugitive and wandering existence within the limits of a particular tract was uncertain," . . . They belong to the owner of the land, and are part of it, so long as they are on or in it, and are subject to his control; but when they escape, and go into other land, or come under another's control, the title of the former owner is gone. Possession of the land, therefore, is not necessarily possession of the gas.¹⁰⁵

In sum, the rule of capture states that there is no liability for capturing oil and gas that drains from someone's land to the driller's well because the driller acquires ownership over the extracted hydrocarbons even though such hydrocarbons have migrated from adjoining lands.¹⁰⁶ Clearly, the rule of capture departs widely from the *ad coelum* doctrine, and some authors see it as a "rule of convenience"¹⁰⁷ and a "judicial policy-making to encourage development of oil and gas resources."¹⁰⁸

As a rule of nonliability, the rule of capture gives landowners incentive to drill as many wells as quickly as possible because if they do not, others will capture the natural resources beneath their lands. Due to its negative externalities, the rule of capture has certain limitations comprised of (i) inherent limitations, (ii) the doctrine of correlative rights, and (iii) conservation laws.¹⁰⁹

One of the inherent limitations of the rule of capture regards escaped hydrocarbons. If the driller, for some reason, loses possession of the oil and gas he has already extracted, he will not lose his ownership of them. There is no transfer of rights in the recapture of escaped hydrocarbons because such a rule would not foster the policy goals of the rule of capture.¹¹⁰ Courts have also recognized inherent limitations to the rule of capture in situations where drainage has been performed by enhanced-recovery operations, which are procedures that improve the reservoir production capacity.¹¹¹ Tomain defends the need to distinguish reservoirs that can be produced by primary-recovery techniques from those that can only be produced through the use of secondary or tertiary-recovery techniques in order for this limitation to be in line with the rule of capture policy goals.¹¹² An interest would not be protected by failing to

¹⁰⁵ *Id.* at 725 (quoting *Brown v. Vandegrift*, 80 Pa. 147, 148 (1975)).

¹⁰⁶ *LOWE*, *supra* note 64, at 9–10.

¹⁰⁷ *Id.*

¹⁰⁸ *Id.* at 10.

¹⁰⁹ *Id.* at 11.

¹¹⁰ *Id.* at 12.

¹¹¹ *Id.*

¹¹² *Id.* at 12–14.

apply the rule of capture to the drainage of a reservoir that can only be drilled through the use of secondary or tertiary-recovery techniques.¹¹³

The second limitation to the rule of capture is the doctrine of correlative rights, which states that “an owner who exercises the right to capture oil and gas is subject to the concomitant duty to exercise the right without negligence or waste.”¹¹⁴ The doctrine aims to provide each owner of a common reservoir the right of a fair chance to produce oil and gas in a reasonable proportion. It thus limits the rule of capture by bringing liability to wasteful-production techniques and negligent damage to the ability of third parties to produce a determined reservoir.¹¹⁵

Lastly, the rule of capture is limited by conservation laws in ways not accomplished by the inherent limitations or the doctrine of correlative rights. In fact, neither limitation can effectively prevent economic and physical waste in the sense of controlling the number of wells drilled over a single reservoir and the intensity of the production.¹¹⁶ Therefore, states began developing conservation laws to internalize the costs arising from the rule of capture, transforming it into a “fair share” doctrine.¹¹⁷ Oil and gas conservation laws purport to rationally develop hydrocarbons by creating, for example, well-spacing rules to prevent over-drilling and production regulation to inhibit waste and protect correlative rights.

Once the rule of capture—which explains the rationale behind the private ownership of hydrocarbons in the United States—is described, the following Section compares the different approaches of each country and the strategic relevance of hydrocarbon ownership.

2. Strategic Relevance of Hydrocarbons Ownership

Brazilian and American legal differences to *in situ* ownership of hydrocarbons are largely a reflection of Brazil’s historical resource nationalism as opposed to the American common law culture of limited government intervention in property rights. It could be argued that public ownership of hydrocarbons provides the government with more flexibility to foster national policy goals as expressed, for example, by the local content requirement of Brazil’s regulation.¹¹⁸ Changing the regulatory framework—as seen with the introduction of the PSA in a context previously ruled by the concession regime—also demonstrates the Brazilian government’s greater flexibility to

¹¹³ *Id.*

¹¹⁴ *Id.* at 14–15; *see also* Elliff v. Texon Drilling Co., 210 S.W.2d 558 (Tex. 1948).

¹¹⁵ LOWE, *supra* note 64, at 16.

¹¹⁶ *See id.* at 18–19.

¹¹⁷ *Id.* at 18.

¹¹⁸ *See supra* Part II.A.3.a.

change the rules of the game when it owns the resources (note that under PSA even the extracted hydrocarbons are owned by the government).

Conversely, it is difficult to imagine the United States furnishing all new rules to change the current setting of hydrocarbons property rights. Such transformation implies a shift of natural resource ownership from the landowner to the American government that would likely face considerable resistance from a culture where the concept of private property is deeply rooted. Nevertheless, the United States may pursue national policy goals through regulation—such as was seen during the price, allocation and entitlement control era (1970-1980)¹¹⁹—as well as with the new safety and environmental standards required for deep-water drilling after the April 2010 Deepwater Horizon accident.¹²⁰

Actually, in assessing the strategic relevance of hydrocarbons ownership, countries consider the property above extracted oil a more important aspect than ownership *in situ*. To fully understand this issue and how Brazil and the United States differ in this regard, we must take a look at the roles played by IOCs and NOCs.

B. *NOC v. IOC*

1. The Origins of the NOCs

Ever since oil began to play a relevant role in the global economy, governments have been concerned with establishing greater control over their oil supplies. This concern dates back to Churchill's time when the British government purchased fifty-one shares in the Anglo-Persian Oil Company.¹²¹ Other countries followed the trend, creating partially or fully owned NOCs to foster secure and reliable energy supplies such as Russia's Gazprom or the China National Petroleum Corporation.

The notion that governments should have control over their oil remains true today. Although today oil is an international commodity, the quest for access continues worldwide. Memories of the OPEC embargo in 1973–74 and political instability in the Persian Gulf and in Latin America are probable drivers of these concerns. Thus, governments often seek some degree of control

¹¹⁹ See TOMAIN & CUDAHY, *supra* note 65, at 237.

¹²⁰ See Press Release, U.S. Dep't. of the Interior, Salazar: Deepwater Drilling May Resume for Operators Who Clear Higher Bar for Safety, Environmental Protection (Oct. 12, 2010), *available at* <http://www.doi.gov/news/pressreleases/Salazar-Deepwater-Drilling-May-Resume-for-Operators-Who-Clear-Higher-Bar-for-Safety-Environmental-Protection.cfm>.

¹²¹ DANIEL YERGIN, *THE PRIZE: THE EPIC QUEST FOR OIL, MONEY, & POWER* 158 (1993). Anglo-Persian later became Anglo-Iranian, and then in 1954 British Petroleum (BP). See British Petroleum - BP (and other appellations) CIA - British Government Files, *available at* http://www.paperlessarchives.com/bp_british_petroleum_cia.html.

over oil supplies.¹²² Not surprisingly, 77% of the global oil reserves are held by NOCs.¹²³ Naturally, NOCs are viewed as more susceptible to government control than the privately-owned major IOCs such as United States-based ExxonMobil and Chevron.

Once the historical background that leads to the incorporation of the NOCs worldwide is explained, the following Section describes the NOC and the IOC models for development of hydrocarbons.

2. The Two Models

Whereas Brazil opted for the NOC model, the United States opted for the IOCs to develop the oil and gas sector. These choices are marked by contrasting views and strong arguments on both sides. Supporters of the IOC model argue for a free market in which markets are considered reliable enough to, even in cases of disruption events, allocate oil according to price,¹²⁴ not political preferences. This view sees resource nationalism as having no perceptible effect on the energy security of other countries because oil companies (regardless of ownership) will base their decision of consumption and sales on profits, and a major component to be considered is the price of transporting oil.¹²⁵ Thus, if oil is produced by a NOC in fields far from its host country, it makes more sense to sell the oil to closer markets than to transport it all the way home. Moreover, this view argues that even in a scenario where the NOC decides to bring home all of the oil produced overseas, this would have no negative effect on the oil supply because other sources would be available.¹²⁶ Additionally, even transporting the oil home in times of disruption could prove to be a major challenge. In the end, the IOC model suggests that oil ownership does not assure oil supply.

On the other side, NOC model defenders argue that governments should not trust market forces to ensure their oil supplies. “The crux of the resource nationalist view is that a country can buy control or influence that comes at the expense of another oil importer.”¹²⁷ In times of disruption, IOCs will give preference to their home country’s supply, and this was the rationale that initially motivated the incorporation of NOCs.¹²⁸ In contrast, IOC model

¹²² Jennifer Lind & Daryl G. Press, *The Strategic Case for Resource Nationalism 2* (Sept. 2011) (unpublished paper prepared for the Annual Meeting of the American Political Science Association) (express authorization on file with author), available at <http://ssrn.com/abstract=1900484>.

¹²³ GOV’T OF BRAZ., *supra* note 16, at 10.

¹²⁴ Lind & Press, *supra* note 122, at 8.

¹²⁵ *Id.*

¹²⁶ *Id.*

¹²⁷ *Id.* at 6.

¹²⁸ *Id.* at 4.

supporters would allege that (to some extent) the same argument could be construed to apply to IOCs headquartered in a specific country: Washington, for instance, could pressure Chevron or ExxonMobil for privileged treatment.¹²⁹ Nevertheless, NOC model advocates could answer by pointing out that the multinational nature of the IOCs' interests naturally differs from the interests of their home governments. IOCs' duties run towards their shareholders, not national security. IOCs' discretion is bounded by the agreements and deals they close worldwide. If the United States government demands its major IOCs to sell the American government all of their oil in case of an oil disruption, it would be asking them to breach their agreements with their customers all over the world. It is unlikely these players would simply yield to government demands for preferential treatment.¹³⁰ This dynamic became clear during the 1973 oil embargo, when Saudi Aramco (an American IOC at the time) was obliged by the Saudis not only to fulfill, but also to police the embargo against the United States.¹³¹ Fearful of losing its market share in the Middle East, Saudi Aramco obeyed.¹³² It seems that the SPR¹³³ was the response by the American government to this risk. In sum, this model supports that "[i]n times of global supply shock, embargo, or blockade," "a strategy of resource nationalism can confer real strategic benefit."¹³⁴

Given this brief overview of the two models, let us take a more detailed look at the approaches adopted by Brazil and the United States.

3. United States Versus Brazil

The United States has never had a NOC. The idea is seen as a non-market strategy policy,¹³⁵ which clearly aligns the U.S. approach with the IOC model. A 2007 report for Congress analyzing the role of NOCs in the

¹²⁹ Empirical evidence of this influence was seen in Washington's response to China National Offshore Oil Corporation's unsolicited bid to acquire Unocal for \$18.5 billion in cash. See Llewelyn Hughes & Sean J. Kreyling, *Understanding Resource Nationalism in the 21st Century*, J. OF ENERGY SEC. (July 26, 2010), available at <http://www.ensec.org/index.php?option=comcontent&view=article&id=253:resource-nationalism-in-the-21st-century&catid=108:energysecuritycontent&Itemid=365>.

¹³⁰ Lind & Press, *supra* note 122, at 11.

¹³¹ YERGIN, *supra* note 121, at 621.

¹³² *Id.*

¹³³ See *supra* Part II.B.2.

¹³⁴ Lind & Press, *supra* note 122, at 3.

¹³⁵ ROBERT PIROG, U.S. CONG. RESEARCH SERV., THE ROLE OF NATIONAL OIL COMPANIES IN THE INTERNATIONAL OIL MARKET 15 (Aug. 21, 2007), available at <http://www.fas.org/sgp/crs/misc/RL34137.pdf>.

international oil market examined the implications and consequences of creating a United States NOC.¹³⁶

In favor of the incorporation of a NOC, the report argues that a United States NOC would act as a balance to offset other NOCs as well as to act in cooperation with other NOCs.¹³⁷ This scenario would likely facilitate the relation between the interests of the U.S. government and oil issues. Additionally, a United States NOC would be less vulnerable to foreign governmental coercions due to its public ties and would be more committed to established energy policy goals.¹³⁸ Eventually, a United States NOC could provide U.S. consumers with lower-cost petroleum products.¹³⁹

However, the counter arguments to this idea tend to be much stronger. IOCs are considered highly effective, in terms of efficiency and productivity, in finding and developing new oil reserves.¹⁴⁰ “Their performance is especially impressive in light of growing difficulties in gaining access to areas of the world where potential discoveries may be made.”¹⁴¹ Studies show that NOCs produce a significantly lower annual percentage of upstream reserves, underperforming by between 21% and 30% when compared to their private counterparts.¹⁴² The following conclusion is that ownership matters in the sense that private ownership encourages better performance and greater efficiency than state ownership does.¹⁴³ These arguments have been persuasive in explaining why the United States favors the IOC model. If the U.S. government incorporated a NOC, it would send a signal that might weaken the position of United States IOCs, a result unlikely to enhance U.S. energy security.¹⁴⁴ Further, during periods of disruption, host governments may be more inclined to expropriate or ban a United States NOC than an IOC.

Brazil, on the other hand, has a highly influential NOC, Petrobras. The company was incorporated in 1953 as the outcome of the popular “the oil is ours” campaign, with the goal of exploring Brazil’s oil and gas, a public monopoly at the time.¹⁴⁵ Petrobras is now a publicly traded corporation

¹³⁶ *Id.*

¹³⁷ *Id.*

¹³⁸ *Id.*

¹³⁹ *Id.*

¹⁴⁰ *Id.* at 16.

¹⁴¹ *Id.* at 15.

¹⁴² Christian O. H. Wolf, *Does Ownership Matter? The Performance and Efficiency of State Oil Vs. Private Oil (1987-2006)*, 37 ENERGY POL’Y 2642–52, 2650 (2009).

¹⁴³ *Id.*

¹⁴⁴ PIROG, *supra* note 135, at 15.

¹⁴⁵ *See supra* Part II.A.1.

controlled by the Brazilian government, present in twenty-eight countries,¹⁴⁶ and the seventh biggest energy company in 2012 in the world¹⁴⁷ with a market cap of \$124.7 billion.¹⁴⁸ It has activities in the sectors of exploration and production, refining, oil and natural gas trade and transportation, petrochemicals and derivatives, electric energy, biofuel and other renewable energy source distribution. Petrobras 2012–2016 business plan calls for investments in the order of \$236.5 billion.¹⁴⁹ Although Petrobras lost exclusivity to develop oil and gas in Brazil in 1995 when the country raised the monopoly restrictions and opened itself to other OCs to explore and produce hydrocarbons, the recent introduction of the PSA regime forecasts a very relevant role for Petrobras,¹⁵⁰ suggesting a reinforcement of Brazil's NOC model.

In fact, Brazil follows a worldwide trend of ownership attributes. Recent studies show that NOCs have increased ownership over strategic global reserves from 72% in 2005 to 78% in 2008.¹⁵¹ The figure below shows the changes in reserve ownership and proportional market value ("PMV") from 2005 to 2008 of NOCs, Foreign NOCs ("FNOCs"), integrated global companies,¹⁵² and other companies. The PMV is the percentage of all the companies' market values that belong to the company grouping. While NOC is the only company grouping to increase reserve ownership, they also increased their PMV by 78%.

¹⁴⁶ *Profile*, BR PETROBRAS, <http://www.petrobras.com.br/en/about-us/profile/> (last visited Mar. 19, 2013) [hereinafter BR PETROBRAS].

¹⁴⁷ *2013 PFC Energy 50*, PFC ENERGY, <https://www.pfcenergy.com/PFC-Energy-50/PFC-Energy-50> (last visited Mar. 19, 2013). In 2011, it was the fifth biggest, and in 2012 the seventh biggest. *Id.* Petrobras's decrease is mostly due to losses accruing from public policy decision to hold back gas prices to Brazilians. In short, Petrobras imports gas for a higher price (market price) than it sells in the local market (subsidized price). As a result of this policy, Petrobras's common stock was worth its lowest price for the past seven years in February 2013. *See Petrobras ON Recua Para Menor Preço em 7 Anos*, ECONÔMICO VALOR (Feb. 7, 2013), <http://www.valor.com.br/financas/2998444/petrobras-recua-para-menor-preco-em-7-anos>.

¹⁴⁸ *2013 PFC Energy 50*, *supra* note 147.

¹⁴⁹ *See* BR PETROBRAS, *supra* note 146.

¹⁵⁰ *See supra* Part II.A.3.

¹⁵¹ Gavin L. Kretzschmar et al., Abstract, *The Ownership Advantage of Resource Hosting*, 1 GLOBAL ECON. & FIN. JOURNAL (2009), available at <http://ssrn.com/abstract=1319494>.

¹⁵² Gavin L. Kretzschmar et al., *The Value of Strategic Resource Ownership—National Winners & Major Losers* 15 fig.2 (Jan. 2, 2009) (unpublished manuscript), available at <http://papers.ssrn.com/sol3/papers.cfm?abstractid=1322556>. An integrated global company (also known as oil major) is engaged in the upstream oil and gas sector, as well as at least one other significant activity in the downstream sector. *See id.* at 8.

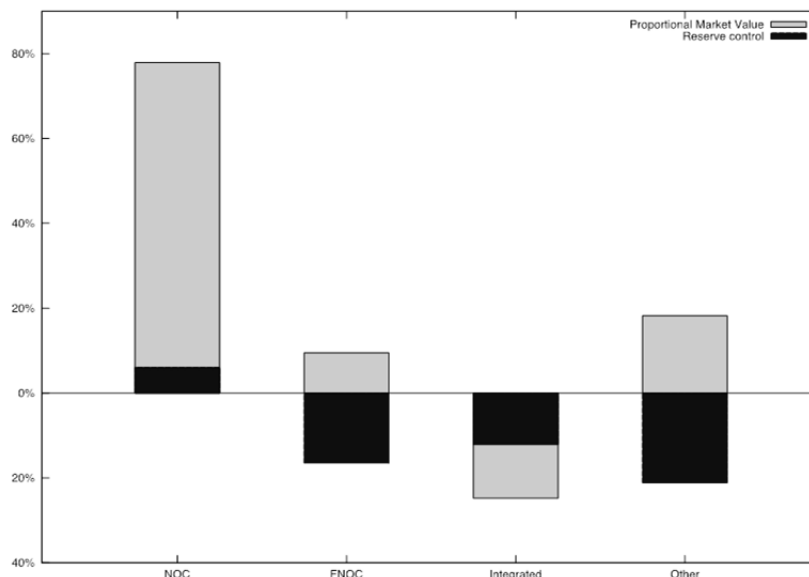


Figure 4

Graph Courtesy of Gavin L. Kretzschmar¹⁵³

The study assessed 4,078 oil fields across seventy-nine host countries to demonstrate that NOCs have increased ownership at the expense of all competitor groups and that the six giant oil majors (ExxonMobil, BP, Total, Chevron, Eni, and ConocoPhillips) are the most affected as they compete for similar assets.¹⁵⁴ As IOCs are gradually losing space, the NOC dominance looks set to redefine the sector. Nevertheless, since NOCs significantly underperform the private sector in terms of output efficiency and profitability, it seems that the preference for NOCs usually comes at an economic cost.¹⁵⁵

In the end, although Brazil adopted the NOC model whereas the United States embraced the IOC model, both approaches provide pros and cons aligned with each country's goals and historical context.

IV. CONCLUSION

This Article began by providing a comparative analysis between American and Brazilian oil and gas exploration and production regimes. Although both countries adopted similar frameworks regarding the granting of oil and gas development rights, the government's take, and driller duties, they have markedly different approaches to hydrocarbon ownership.

¹⁵³ *Id.* at 15.

¹⁵⁴ Kretzschmar et al., *supra* note 151, at 1.

¹⁵⁵ Wolf, *supra* note 142, at 2.

Brazil has a public ownership rule for *in situ* hydrocarbons and different rules for extracted hydrocarbons, depending on if the applicable regime is concession in which ownership will be transferred to the extractor or PSA in which ownership is kept by the government even after extraction. In this context, Brazil relies on a rather strong NOC, Petrobras, which under the PSA regime has an even more relevant role as the sole operator with mandatory 30% participation in the pre-salt oil fields. This trend seems aligned to the increasing shares of world reserves retained by NOCs although at a probable economic cost due to the historical underperformance of NOCs compared to IOCs.¹⁵⁶

The United States, on the other hand, has private ownership of hydrocarbons as a rule, consistent with the common law approach to property rights. Consequently, American oil and gas development is based on the IOC model and the free market view. Despite IOCs' proven better performances, this model seems to be losing favor worldwide to the NOC model.

In the end, it is very hard to assess if any model should prevail over the other. Whereas the NOC model clearly prevails from a reserve ownership standpoint,¹⁵⁷ it is also subject to public policy decision that may compromise its profitability.¹⁵⁸ Likewise, while the IOC model prioritizes performance, it is not completely free from governmental interference.¹⁵⁹ Each approach has its upsides and downsides, and they seem to fit the historical context and legal environment of each country.

¹⁵⁶ This is merely an assumption based on the studies reviewed because there is no empirical evidence of Petrobras's actual performance when compared to its IOCs peers.

¹⁵⁷ See GOV'T OF BRAZ., *supra* note 16, at 10.

¹⁵⁸ See 2013 PFC Energy 50, *supra* note 147.

¹⁵⁹ See *supra* notes 119–120 and 129.