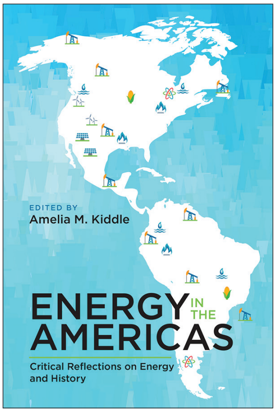
UNIVERSITY OF CALGARY
Press



ENERGY IN THE AMERICAS: CRITICAL REFLECTIONS ON ENERGY AND HISTORY

Edited by Amelia M. Kiddle

ISBN 978-1-55238-940-9

UNIVERSITY OF CALGARY
Press
press.ucalgary.ca

Acknowledgement: *We acknowledge the wording around open access used by Australian publisher,* **re.press**, *and thank them for giving us permission to adapt their wording to our policy* http://www.re-press.org

9

The New Political Economy of Petroleum in Brazil: Back to the Future?

Gail D. Triner

One of the most important recent changes to the energy scenario in the Americas has been the discovery of large reserves of petroleum in the pre-salt layer of the Atlantic Ocean bed off the coast of Brazil. These reserves have the possibility to significantly improve material conditions for the Brazilian population. The subject of petroleum within Brazilian political economy has always been highly fraught. During the 1970s and ’80s, Brazil was the largest oil importer among developing countries. Subsequently, discoveries of large offshore deposits nurtured the probability of oil self-sufficiency. The more recent confirmation of the pre-salt deposits has encouraged the expectation that the nation could emerge in the twenty-first century as an important exporter. Along a parallel trajectory, in the 1990s the Brazilian political economy regime underwent a fundamental transition, from the highly managed protectionist and state-directed system that prevailed from the 1940s to one of relative openness to global markets. The transition entailed important changes in the economic role of the state. This chapter argues that the pre-salt petroleum sector demonstrates the fragility of macroeconomic regime change.[1]

Globally, the “resource curse,” or the inability to use natural-resource-derived wealth to generate broadly based and sustained economic growth, has most strongly attached to oil.[2] Three characteristics define this curse: Dutch disease, rent-seeking, and the diversion of externalities from natural resources to specific economic actors. "Dutch disease" refers to structural shifts that favour the production and export of raw commodities (in this case, petroleum) to the detriment of domestic (industrial) sectors of the economy because of the increasing value of local currency as global revenues enter the economy. In the modern literature, this process results in deindustrialization.[3] Extraction of profits in excess of "normal" profits, necessary to maintain investment, defines rent-seeking. Finally, the positive externalities (or "spillover effects") creating opportunities that could accrue beyond petroleum producers to generate technological growth and profits to support industries can respond to market conditions, or industrial policy can direct the beneficiaries and distort costs.

With respect to other commodities, Brazilians do not have a history of escaping the resource curse. Periodic generation of wealth from the production of primary commodities—sugar, coffee, rubber, iron ore, soybeans, etc.—has not contributed to widely distributed and sustained well-being among the population. The transition during the 1990s toward an open economy would lead theorists to expect the Brazilian government to mitigate the effects of the resource curse, at least with respect to the incentives to control rent-seeking and manage externalities. The shift from treating petroleum as a protected and centrally managed good to a market-driven commodity proceeded relatively smoothly in Brazil during the 1990s and first decade of the twenty-first century, until the discovery of the pre-salt deposits. While it is too early to know with confidence if Brazil will suffer from Dutch disease with respect to petroleum, some analysts have noted an association between deindustrialization and the recent export booms.[4] This chapter focuses on actions that have been central to rent-seeking and industrial policy, with a time frame that continues through the first decade of the twenty-first century.[5]

Straddling the lines between historical and policy analysis, the chapter analyzes the political-economic history of petroleum in Brazil in order to examine the emerging rules of petroleum governance. It concludes that recent governance reforms have changed the actors and permissible actions without mitigating the deeply entrenched ambitions that originally governed the structure of the sector: energy security, sophisticated industrialization, national control of the industry, and public-sector financial gains. As petroleum wealth has loomed larger on the Brazilian horizon, nationalist industrial policies have re-emerged and explicit rent-seeking has consumed much energy in the midst of inconsistent reconciliation of governing rules.[6] Brazil is not unique in generating inconsistencies in governance because of potential natural resource wealth. Neither is petroleum unique within Brazil as a venue for governance struggles. Its importance derives from the potential size of the sector and the depth of its implications for the Brazilian economy.

Petroleum and the State in Brazil, Updated

Petroleum policy was in place long before the discovery of oil. Small deposits in the province of Bahia in 1864 were of interest for their potential in the manufacture of kerosene, mostly for lighting.[7] Active exploration began in 1892, and industrial ambitions motivated further interest. Petroleum arose as a national issue in the early 1930s. The political rhetoric of national sovereignty with respect to control and ownership shaped the controversy that surrounded oil. Brazil's history as a commodity-export-producing colony, along with its subsequent vulnerability to global demand trends and reliance on imports for manufactured goods, provided the backstory that justified "economic nationalism." Framing its importance in terms of national defence and economic security,[8] the Brazilian military and industrial sectors sought a means to finance petroleum exploration. They based their arguments for direct state participation on the externalities of petroleum development. The substance was necessary to fuel the large-scale modern industrial sector that was integral to their concept of Brazil's future. This perspective assumed the status of accepted wisdom at the highest levels of government. In 1939, President Vargas announced that "It remains for us now to industrialize petroleum and install large steel, which we will do soon. . . . Iron, coal and petroleum are the mainstays of any country's economic emancipation."[9] These ideas underpinned the state's role within the petroleum sector.

In 1953, the Petroleum Law provided for the formation of Petróleo Brasileiro S. A. (Petrobras) with public-sector capital; the law also mandated national control.[10] This solution to the nagging concerns over the need to provide support for industry consolidated strategies of state-driven economic nationalism.[11] The state stepped in to substitute for private-sector capital of foreign or domestic origin.[12] Petrobras based its legitimacy on the state's claims to property rights to extracted oil and the firm-ownership model of earlier state-owned enterprises (overwhelming ownership and control by the federal government, but organized as limited liability companies with shares tradable on the Brazilian stock exchange).[13] Petrobras became a central player in an activist growth strategy that relied on import substitution industrialization. The firm had three functions within this strategy. First, it was responsible for maintaining the supply of petroleum for the Brazilian economy. Second, by virtue of the price differential between imported crude and refined petroleum derivatives, Petrobras refineries provided significant foreign exchange savings for an economy in chronic deficit. Finally, externalities of the petroleum sector spurred further industrial development through both the local demand that Petrobras generated for industrial goods and the physical infrastructure that the firm constructed. The anticipated externalities included directing the supply and allocation of petroleum at government-regulated prices and advancing industrialization by creating domestic demand for sophisticated manufactured products for its own operations. Through most of the twentieth century, the goals of petroleum policy were to support growth and minimize the financial drain and economic vulnerability of oil's prominence in the total basket of imports (see figure 9.1). Until the discovery of offshore deposits in the 1970s, Petrobras focused on refining, domestic distribution, and international expansion to secure supply, while serving as a conduit for national industrial policy.

Two factors fundamentally reshaped Brazilian ambitions within the petroleum sector. The energy crises of the 1970s highlighted the benefit of energy independence at the same time that Brazilians were discovering rich offshore deposits of petroleum. The global oil shocks of 1973–4 and 1978–9 reoriented the political economy of petroleum in Brazil.[14] Global petroleum embargoes, with associated price increases, escalated the cost of continued reliance on imports (see figure 9.2). Nevertheless, the Brazilian state continued its aggressive industrial policy. The resulting increase of sovereign debt and deterioration of balance of payments generated by oil price increases motivated new strategies for oil policy. Domestic

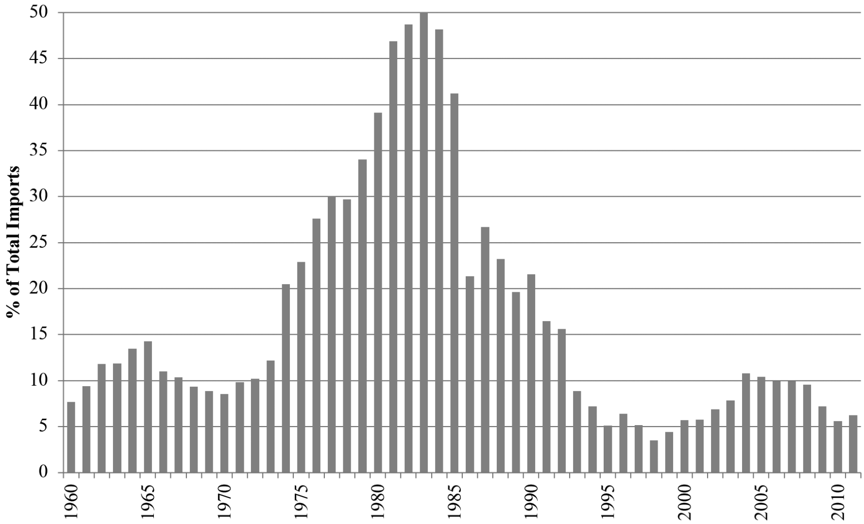


Figure 9.1 Crude Petroleum Imports (Value) % of Total, 1960–2011

Source: UN Comtrade, http://comtrade.un.org, and UN Statistical Office, *International Trade Statistics Yearbook* (New York: United Nations, various years).

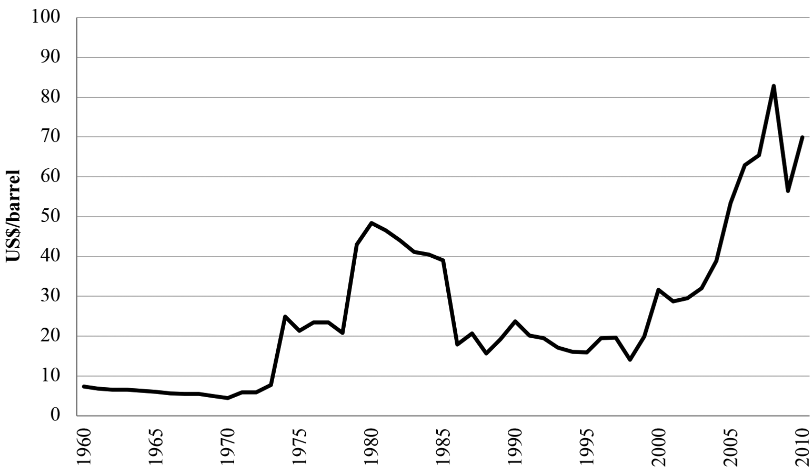


Figure 9.2 World Petroleum Prices, 1960–2010 Real (2005)

Source: World Bank Open Data, https://data.worldbank.org/

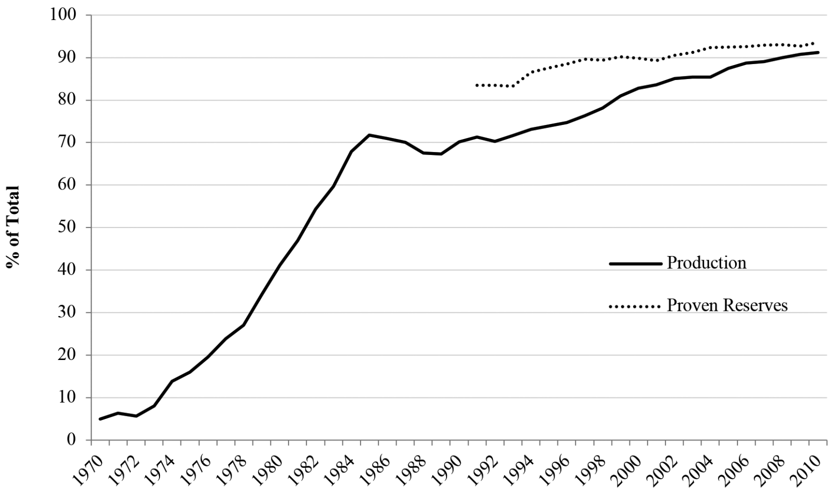


Figure 9.3 Oil Production and Reserves, % from Offshore, 1970–2010

Sources: Instituto Brasileiro de Geografia e Estatística and Conselho Nacional de Estatística, *Anuário Estatístico do Brasil* (Brasília: Imprensa Nacional, various years).

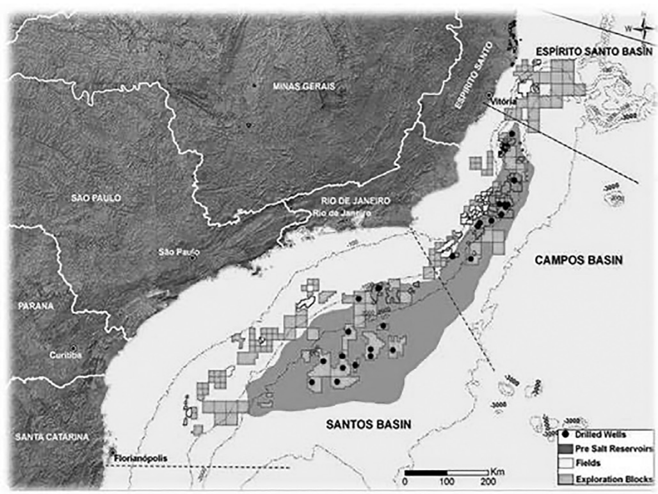


Figure 9.4 Offshore and Pre-salt Petroleum Reserves in Brazil

Source: "Brazil: Petrobras Discovers Oil in BM-S-17 Santos Basin Block," *Energy-pedia News*, 16 December 2009.

Table 9.1 Global Petroleum Reserves (Year-End 2009; Billions Barrels of Oil Equivalent)

Global Petroleum Reserves		
(year-end 2009; billions barrels of oil equivalent)		
Brazil	106	
Pre-salt		90
Other		16
Top 5 Producers (2009)		
Saudi Arabia	264.6	
Venezuela	172.3	
Iran	137.6	
Iraq	115	
Kuwait	101.5	
Total, Top 5	791	
Brazil, % Top 5	**13.4**	

Sources: Agência Nacional de Petróleo, *Anuário Estatístico* (Rio de Janeiro: Agência Nacional de Petróleo, 2014), table 1.1; Paulo César Ribeiro Lima, *Pré-Sal*: *O novo marco legal e a capitalização da Petrobras* (Rio de Janeiro: Synergia Editora, 2011), for the estimate of 2009 pre-salt reserves.

exploration regained priority status in national energy policy. Petrobras found new reserves in the early 1970s, primarily in offshore locations (see figure 9.4), and new wells began operation throughout the decade.[15] State investment in exploration activities tripled between 1973 and 1979.[16] With time, Brazilian oil deposits proved richest in offshore locations. Subsequently, production more than tripled from 1979 to 1987. Offshore production rose from less than 6 per cent of total production in 1970 to 91 per cent in 2009 (see figure 9.3).

Petrobras confirmed its discovery of pre-salt deposits in 2007. The newly discovered reserves have created the opportunity for an additional commodity to assume a major role within the domestic economy. The pre-salt deposits have transformed the goal of self-sufficiency into an expectation of a strong new source of export revenues. At the time, the proven reserves of Brazilian deposits was the equivalent of 13 per cent of the combined proven reserves within the five largest global producers, and the pre-salt reserves accounted for 85 per cent of Brazilian holdings (table 9.1). By another estimate, at the end of 2011 predictions of the volume of these reserves ranged between 50 billion and 123 billion barrels of petroleum equivalent.[17] Through the 2010s, the first-order impact of these deposits has been small, but rapidly increasing. Production from the pre-salt deposits began in 2008 and accounted for 0.4 per cent of total output; by 2013, the pre-salt was the source of 15 per cent of crude oil production.[18]

Industrial Policy and Petroleum

One of the first and strongest signals about the state's preoccupation with oil occurred when the Mining Code began to treat hydrocarbons differently from subsoil minerals in 1937. In contrast to minerals, the oil itself was to be the property of the state. This distinction removed petroleum from private ownership claims. Opposition to foreign ownership was behind the prohibition of private ownership.[19] As a result, the scope for developing the oil sector in a manner consistent with dynamic market conditions capable of attracting sufficient private capital narrowed considerably.[20] By the late 1940s, Juarez Távora, the minister of agriculture, where regulatory authority for oil and minerals resided, understood both that continued exploration would require large-scale state intervention (he phrased it as "monopoly") and that a state monopoly was politically infeasible.[21] Constituting Petrobras as a state-owned enterprise in 1953, with a monopoly for prospecting (and anticipatorily, producing) and refining petroleum was a major break with earlier principles.[22]

By the late 1950s, petroleum policy needed to grapple with the tangible problems of supply and distribution. The mandate and rules for operations expanded, and vertical integration of production processes occurred at a rapid pace through the 1960s. In 1963, the monopoly was widened to include transport as well as the import and export of crude petroleum and its refined derivatives. Petrobras also took on responsibility for the broader policy of overall energy self-sufficiency.[23] It became one of the most complicated conglomerate firms in the developing world. Throughout the decade, the company created subsidiaries for petrochemicals (mostly fertilizers for agro-industrial application, rubber-based products, and plastics), retail distribution and international expansion for commodity trading, overseas exploration, and currency management. [24] With the exception of retail distribution, the state-owned enterprise had monopoly rights in each of these areas. The economic policies that most affected Petrobras were those that defined the company's role in the macro-economy and its position within the industrial policy of import substitution. These included price and currency controls, output allocation and distribution to critical consumers or deficit regions, and pricing and trade preferences. In all of these fields, Petrobras received preferences and exemptions to further the goal of increasing petroleum availability through imports of crude oil, which Petrobras would refine. The firm also adopted pricing, distribution, and contracting practices in coordination with national industrial policy.[25]

The model of state ownership faced pressure as early as the 1970s and '80s. Closed capital markets compounded the problems of international supply uncertainty (the oil shocks described above) as well as financial and fiscal crises.[26] Given the hostile economic environment, the state was incapable of investing sufficiently in its premier enterprise. Financial constraints arose simultaneously with the discovery and development of large offshore deposits. The technology and logistics for offshore production (transportation of equipment, personnel, and output between sites and the coast, maintenance of drilling platforms, etc.) were capital-intensive. Channeling increased investment to basic exploration constrained other aspects of the firm's development and maintenance.

How was Petrobras able to implement the expansion of exploration and technology that was necessary to explore and drill the offshore discoveries needed to transform Brazil from major importer to self-sufficiency?

Rethinking the relationship with foreign actors, Petrobras began to structure mechanisms to tap the capital, operational capability, and technology of major oil producers. The firm entered into joint ventures (termed "risk-sharing contracts") with multinational oil-producing and servicing enterprises. The change reversed the earlier strong prohibitions against foreign presence in Brazil. Prior to the first risk-sharing contracts in 1975, federal concessions to Petrobras determined its exploration and production rights. The firm negotiated contracts with foreign and domestic entities to provide goods and services for fixed fees.[27] All of the risks and potential profits remained with Petrobras, and by extension with the Brazilian state. Through joint ventures, Petrobras created partnerships with its providers that divided the risks and potential profits. Risk sharing provided a means to attract the capital and technology required to develop newly discovered offshore deposits. Simultaneously, it maintained industrial policy, the formality of the Petrobras monopoly, and the public domain of the petroleum. Petrobras retained its monopoly of supply as well as control of all stages of production.[28]

By the end of the 1970s, Petrobras had joint ventures with twenty firms, primarily to develop the offshore deposits of the Campos Basin (see figure 9.4). The ability to partner with foreign and domestic companies opened the way for private actors to explore, produce, and profit from Brazilian petroleum.[29] Industry participants interpreted the introduction of joint ventures as the first step away from the tightly controlled Petrobras monopoly and toward global market competition in supply and production.[30]

Macroeconomic Regime Change

Disruptions in financial markets resulting from the oil shocks focused at least as much attention on the link between macroeconomic policy and the state's entrepreneurial role as they did on petroleum policy.[31] Lack of public-sector capital for investment in the light of fiscal crisis, excessive debt burden, inflation, and political uncertainty left Petrobras and other state-owned enterprises underfinanced. Aligning policy to minimize these detrimental circumstances, and to benefit from globalizing practices that had transformed other economies during the decade required, loosening the grip of import substitution industrial policy.

The Brazilian economy began to introduce many neoliberal reforms that addressed the prevailing crises and aligned governance more closely with global trends by the late 1980s. Doing so reversed the broad industrial policies that prevailed throughout the mid-twentieth century. The pillars of the new strategy were the privatization of many state-owned enterprises and the liberalization of commerce. In the international sphere, liberalizing commerce meant reducing trade barriers and emphasizing global business and trade partnerships. The Constitution of 1988 remodelled the state's economic role to include regulating, planning, and incentivizing private enterprise, mandating the privatization of state-owned enterprises.[32] The Constitution also continued to treat humanly produced goods differently from non-renewable natural resources. Petroleum, natural gas, other hydrocarbons, and nuclear minerals remained property of the state, and Petrobras remained a protected state monopoly.[33]

Although privatization was never seriously considered as a strategy for Petrobras, the sector undertook significant policy reform. Petrobras and energy policy-makers faced strong incentives to open the firm to large outside investment as they tried to balance rapidly escalating capital needs to extend and deepen offshore capability within the limits of strong fiscal constraint and prohibition against competition. The state's response was to "flexibilize" the monopoly with a constitutional amendment in 1995.[34] In this framework, the state retained resource ownership while private actors, including foreign companies, could obtain exploration and production rights.[35] In addition, the Petroleum Law of 1997, which operationalized the amendment, opened other activities, such as refining and transportation, to private (including foreign) investors. The law required open access to pipelines, maritime tankers, and other transport; producers could not operate proprietary facilities.[36] Opening the sector to private participants was politically contentious and necessitated a wide range of regulatory changes; but it did not challenge Petrobras. By 2006, Petrobras still retained 95 per cent of the domestic market in petroleum-derivative products.

Beyond broadening the sector's actors, these reforms supported Petrobras's ability to raise capital in private equity markets, offering a second avenue to the overarching goal of building the capital and technology of the petroleum sector. Doing so supported the firm's growth without requiring public-sector resources. However, the crucial caveat that the state would retain a majority share of Petrobras (minimally, 50 per cent plus one ordinary share) remained in place. Issuing equity on the São Paulo stock exchange raised the equivalent of US$807 million in 2001. Even more radically, Petrobras raised US$5.1 billion by selling equity shares on the New York Stock Exchange in 2002. Opening the enterprise to private capital allowed it to grow extremely rapidly while maintaining the state's control.

Capital expansion had important implications for both petroleum and capital markets. For Petrobras, the new capital financed the company's ever-increasing offshore production and technology development through larger partnerships as well as its own development investments. Increased capital was a crucial factor that contributed to positioning Petrobras as a major global petroleum company in all aspects of production and technology development. Although not the topic of this chapter, the governance practices and procedures for financial capital within Brazil were, arguably, more affected by the Petrobras stock issuance than the first-order effects on the firm. Raising capital from Brazilian investors on the São Paulo exchange aided the promotion of pension fund, mutual fund, and individual investment. International markets (the New York Stock Exchange) bound Petrobras to international corporate governance standards with respect to financial transparency and such operational areas as safety, human resources, and environmental protections.[37]

Back to the Future: Rent-Seeking and Industrial Policy

The confirmation of pre-salt deposits in 2007 motivated another overhaul in the governance of the petroleum sector. The revamped approach, legislated in 2010, applies both to production and to the rents captured by the state. The cornerstone of the reform has been to treat deposits in the pre-salt layers differently from onshore or post-salt (offshore, but not pre-salt) oil. Separating the pre-salt from traditional petroleum paved the way for changing the relationship between producers and the state.

Profit-sharing (also known as production-sharing) contracts shape the relationship between producers and the state, rather than fixed concessionary leases.[38] Profit-sharing is a major break with the history of non-renewable resource management in Brazil. Fixed concessions, compensated by royalty payments, had served to allocate access to non-renewable natural resources since the earliest Portuguese settlement.[39] The Petroleum Law of 1997 maintained this practice while opening the sector to foreign participants through joint ventures. With the 2010 legislation,[40] the federal government will receive a portion of its compensation for production and exploration rights in the form of a share of the pre-salt projects' profits, and payment will be in oil.[41] As a result, both project profitability and global oil prices will determine the state's financial benefits. The state's proportion of profit is not fixed; it is one variable in each auction bid. The motivation for changing allocation practices derived from the extent and certainty of pre-salt reserves. Instituting a discriminatory contractual format indicates the extent to which the Brazilian government believes itself to be in a seller's market with respect to its new reserves.

RENT-SEEKING

Explicit rent-seeking, the attempt of the public sector to extract maximum revenues from petroleum production, was new with the opening of the Brazilian economy in the 1990s. The state had no incentive to extract rent from a fully state-owned monopoly (in contrast to private-sector actors extracting a favoured position in receiving benefits from that monopoly). The increased revenues promised by the pre-salt discoveries, combined with the potential presence of many private-sector producers, has strongly promoted rent-seeking in the forms of royalties and the manner in which the state plans to protect its financial interests in the sector.

Royalties are an additional form of compensation, after profit-sharing, that producers will pay to the Brazilian state for production rights. The federal government, states, and municipalities have displayed rent-seeking behaviour and have politicized the use of their potential pre-salt royalties. Separating the pre-salt sector from other petroleum and instituting production-sharing as the basis for entering exploration and production leases paved the way for differential royalty schedules. Traditional operations typically compensate the state with 5 per cent of the value of production (increased to 10 per cent for especially rich deposits). Royalties from leases governed by production-sharing contracts will be 15 per cent of "profit oil" (the volume of oil produced, after deducting the costs of production).[42]

When enacted in 1985, covering the traditional oil sector, royalties were fully distributed to the states and municipalities associated with extraction.[43] The distribution of royalties from profit-sharing contracts (i.e., the pre-salt deposits) has motivated a larger number of claimants to step forward. Arguments on the grounds of property rights, natural resource theory, and pecuniary interests have easily become conflated. The Constitution of 1988 and subsequent pre-salt-related law clearly delineate petroleum as strategic property belonging to the nation of Brazil (commonly interpreted to be the government, as representative of all Brazilian citizens).[44] Theories associated with the extraction of non-renewable natural resources prioritize intergenerational transfer in considering both the level and distribution of royalties. These economic ideas have long held that, once extracted, the potential wealth is no longer available to future generations, and therefore, excess returns (above normal return on capital) on the resources should be invested for the benefit of future generations.[45] Local governing agencies argue for royalties as compensation for the costs of rapid development of physical and social infrastructure to support the industry, as well as environmental protection. In practice, the costs of supporting extraction and local interests often render the economic definition subordinate to political interests.

Claimants for royalties include municipalities and states hosting the pre-salt exploration and production facilities. These are a very few municipalities, most notably Campos dos Goytacazes and Macaé in the state of Rio de Janeiro, followed very distantly by towns in the states of Espírito Santo and São Paulo.[46] In the 2010 legislation, federal agencies also laid claim to royalties for naval support and an environmental defence fund. Non-producing states and municipalities received a small portion and the federal government claimed the remaining 30 per cent of royalty payments. Intergenerational wealth transfer away from future owners of the resource (all Brazilians), which would have directed royalty payments toward human and social capital investments, was not recognized.[47] Reflecting the contentious and political nature of these decisions, a subsequent re-specification of the royalty legislation shifted the allocation toward the federal government and non-producing state/municipal governments.[48] Almost immediately the producing states challenged the 2012 agreement, and subjected it to Supreme Court review in 2013. A restated law of March 2014 confirmed the transfer of royalties allocated to the federal domain and non-producing regions (see table 9.2). The still largely unrealized pool of funds from royalties to the federal government also became a political tool, with the distribution again open to legislative change. In 2013, in response to widespread street demonstrations against the expense and disruptions caused by the country's preparations for the 2014 World Cup and 2016 Olympic Games, the federal government committed to allocate

Table 9.2 Petroleum Royalties

			Special Participation (4)		**Pre-salt Original**	**Pre-salt, Amended**	
	On-shore	Off-shore	On-shore	Off-shore		Conces-sions	Profit-sharing
Year royalties became effective	1991		1998		2010	2013 (5)	
Royalty Rate (%) (1)	5	5	5	5	10	10	15
Distribution (% of royalty revenues)							
Producing states	70		52.5	22.5	26.25	26.25	25
Producing municipalities	20		15	22.5	26.25	26.25	6
Affected municipalities (2)	10	10	7.5	7.5	8.75	8.75	3
States-adjacent to wells		30					
Municipalities-adjacent wells		30					
Navy		20		15			
Special fund (3)		10		7.5	8.75	8.75	22
Science & technology Ministry			25	25			
Federal Treasury					30	30	44

Source: Agência Nacional de Petróleo, http://www.anp.gov.br/?pg=74393&m=royalties&t1=&t2=royalties&t3=&t4=&ar=0&ps=1&1427840784440.

NOTES

1 % of value of production for all categories, except pre-salt profit-sharing. For Pre-salt profit-sharing projects, royalties are calculated and paid as a share of volume of production.

2 Special fund: to non-producing states and municipalities.

3 Affected municipalities have facilities that are not directly “producing.” For offshore wells, these are embarkation points.

4 Special participation is the incremental royalty paid on “very productive” wells.

5 The law was approved in 2013; as of April 2015, ANP has not had royalty rates different from the rates effective from 1998.

Federal Treasury’s revenues from all pre-salt profit-sharing projects, Profit shares, Share of royalties, Signing bonus

75 per cent of its pre-salt royalty revenues to education and the remaining 25 per cent to public health in underserved communities.[49]

In addition, the federal government has formed Pré-Sal Petróleo S. A. (PPSA) to protect and maximize the profits the state earns from the profit-sharing projects.[50] Its mandates are to mitigate information asymmetries between the state and oil companies and to serve as a trading company in global markets for the oil that the state receives as its share of profits.[51] PPSA is a wholly state-owned limited liability company under the jurisdiction of the regulatory authority, the National Petroleum Agency (Agência Nacional de Petróleo, or ANP.) This arrangement creates a situation in which the regulator regulates itself and gives the state a direct mechanism for controlling the operations of petroleum producers. No provisions suggesting that resolving potential conflicts of interest between PPSA, ANP, and Petrobras can be achieved in a manner that assures a third party of regulatory independence.[52]

Several criticisms of the profit-sharing mechanisms leave them open to challenge.[53] One major weakness of profit-sharing has been that the bases for calculating the profit to be shared are complicated and obscure. No limit on the share of gross output that recovers costs minimizes the incentive for productivity, just as it creates incentive to overstate costs. Further, the state's share of profits is incremental to the signing bonus and royalty payments. Other petroleum-producing nations using these arrangements accept profit-shares as full compensation for depleting the supply of a non-renewable natural resource, replacing royalties.[54] Beyond the economic and financial concerns, jurists have challenged the constitutionality of PPSA's potential conflicts between the government's regulatory responsibilities and pecuniary interests.[55]

INDUSTRIAL POLICY

Many of the concepts that underpinned early industrial policies supporting import substitution industrialization have re-emerged, with both old and new practices. Overt protection of Petrobras, maintaining an overall energy policy with Petrobras, and directing beneficial externalities to domestic firms were among the most important practices from earlier periods. The most important new tool of industrial policy that the state has invoked is to channel public-sector equity investment to Petrobras through the National Development Bank (BNDES). Petrobras is, once again, both an agent and a beneficiary of industrial policy.

In the most straightforward of the sectoral reforms, the state redefined a very privileged position for Petrobras. The company purchased the exclusive rights (*cessão oneroso*) to five billion barrels of petroleum equivalent in the pre-salt deposits.[56] Although it accounted for less than 6 per cent of the then-anticipated pre-salt reserves, the size of the concession was notable. At the time, the value of the unextracted oil that the contract covered was estimated at US$42.5 billion.[57] The state has recently awarded a second exclusive concession to Petrobras, for 9.6 to 15.2 billion barrels in a newly discovered field.[58] Furthermore, the reforms of 2010 guarantee—or require—a 30 per cent share and lead management of all pre-salt projects to Petrobras.[59]

Significant commitments offset Petrobras's protected access to pre-salt oil. The firm's responsibilities in maintaining the broad-based national energy policy remain in place. The overall goal of national energy policy has always been self-sufficiency, both in petroleum and in total energy supplies, while also supporting rapid economic growth. Petrobras's operation of this policy continues to include the development of biofuels (especially ethanol), investment in pipelines to service the most remote (and hence most costly) regions of the nation, and compliance with price restrictions on retail distribution of gasoline. Prior to pre-salt discoveries (as early as 2003) the federal government rearticulated its expectation that, given Petrobras's dominant position in the Brazilian energy sector, the firm would maintain commitments to regional and social development while also maintaining its international competitiveness.[60]

Further, Petrobras has led the way in establishing norms for domestic content commitments in pre-salt exploration and production.[61] Local content had been one of the key mechanisms for realizing the externalities that early economic nationalists actively promoted: increasing the demand for domestically produced industrial goods and services, developing human capital, and building technological capability. As a traditional state-owned enterprise with monopoly rights, Petrobras highlighted its efforts to enhance the domestic content of its operations.[62] As the practices of auctioning production and exploration leases developed, one variable in evaluating bids for offshore concessions was the bidding company's or consortium's commitment to local content. The regulatory authority, rather than legislative action, determines acceptable levels of local content.[63] In a nominally open market, commitment to maintain local content has become problematic because the policies constrain profit-maximization goals of private firms.

The attempt to foment externalities has evolved. The needs for infrastructure, support goods and services, and technological development in the pre-salt sector increased dramatically the potential impact of mandated local content provisions. Drilling equipment, platforms and refineries, shipping freighters, pipelines, and servicing provisions are the major capital-intensive items subject to local content regulation, as well as sources of skilled job creation.[64] The first contract for pre-salt rights, the exclusive concession, provided that local content of goods and services during the development phase of the project would be 37 per cent and 55 to 65 per cent during production. Petrobras may have established a high threshold in the commitments of its exclusive contract at the same time that it demonstrated the continued political interests in using the petroleum industry as a tool of domestic industrial policy.[65] The standards for determining and calculating local content remain murky.[66] To date, estimates of the short-term cost effects of requiring local, rather than the most cost-efficient, content are not available. Producers and the sector's professional association (Instituto Brasileiro de Petróleo) complain that this form of protection for other domestic industrial sectors slows their operations and increases their costs.[67]

Local content provisions for petroleum-related goods and services have very serious implications beyond the distortion of production and exploration costs. Beginning in 2014, a corruption scandal revealing kickbacks from Petrobras, generated by the governing political party's skimming and rigging of contracts, decimated the management, reputation, and financial value of Petrobras. The entire Board of Directors was replaced in March 2015; Moody's downgraded the creditworthiness of the company's bonds to the status of "junk" (not worthy of investment) in February 2015. The scandal has led Petrobras's partners to anticipate significant delays in pre-salt exploration and production, because of management distraction, bankruptcies, and business bans on contractors enmeshed in the investigations and, possibly, looming capital and credit shortages.[68] Estimates

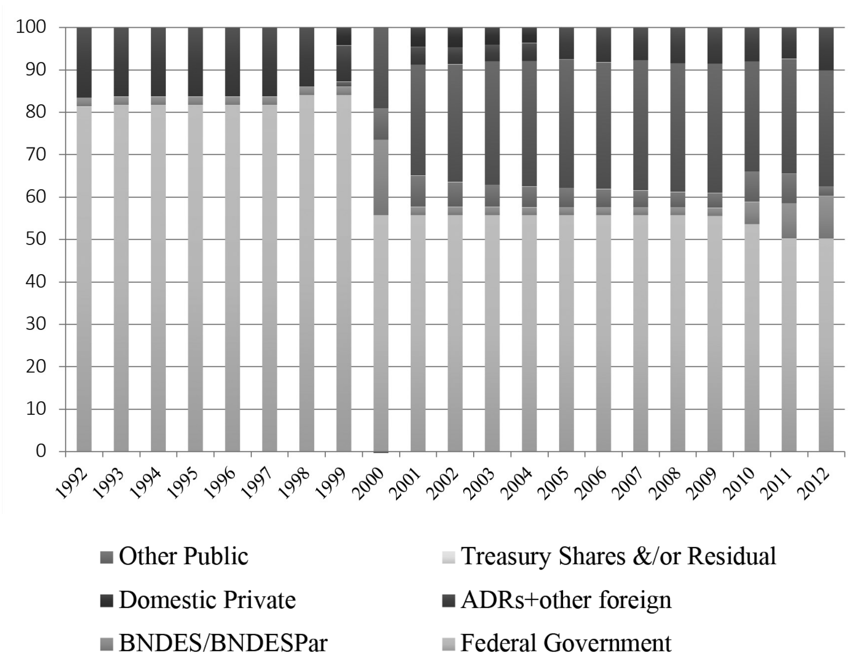


Figure 9.5a Ordinary Shares Distributed by Ownership (%)

Source: Petrobras, "Relatório anual/Annual Report" (various years), https://www.investidorpetrobras.com.br/resultados-e-comunicados/relatorios-anuais/.

of the extent to which Petrobras will provide for losses reach as high as US$20 billion, or about 1 per cent of Brazil's GDP in 2014.[69] Contract tampering and kickbacks are not confined to the pre-salt sector. Nevertheless, a large share of Petrobras's increased operating expenses, and 53 per cent of its investment plan for the 2014–18 period, are targeted for the pre-salt, linking a very large share of contracting to pre-salt development.

The newly emerging industrial policy has emphasized Petrobras's protected position within the petroleum sector from another perspective, which serves to emphasize the state's willingness to remodel its role in the economy. During the 1990s, BNDES received the mandate to operate the federal privatization program. The bank executed valuation surveys and

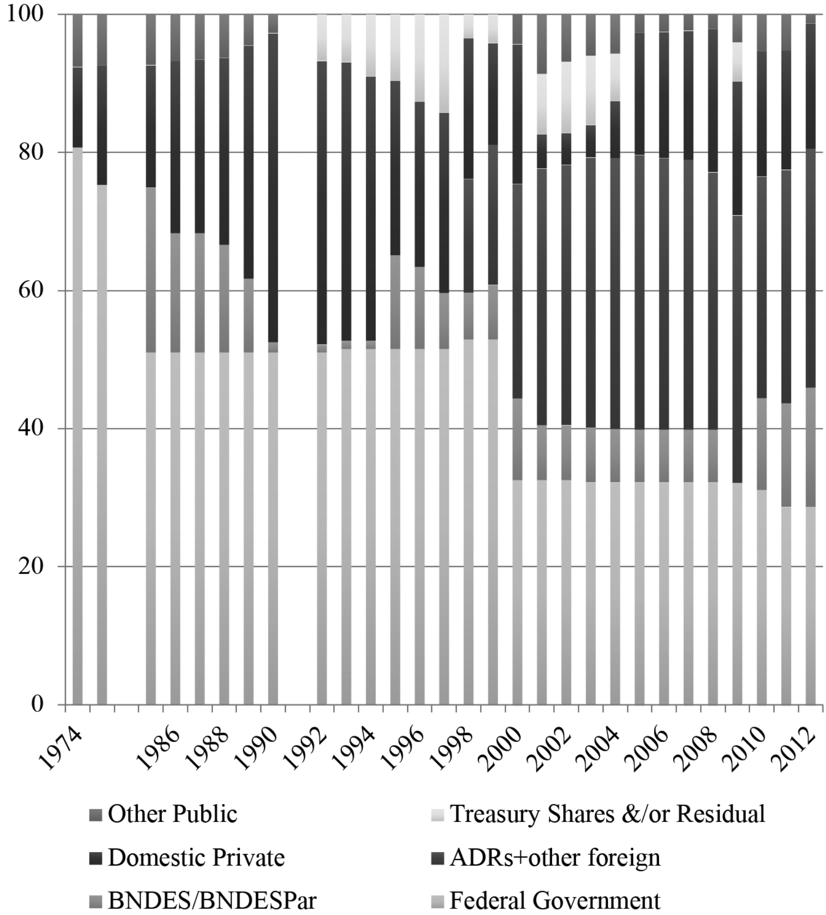


Figure 9.5b Total Shares (Ordinary + Preferred) Distributed by Ownership

Note: BNDES held shares of Petrobras until 1990; thereafter, BNDESPar has been owner of the shares.

Source: Petrobras, "Relatório anual/Annual Report" (various years), https://www.investidorpetrobras.com.br/resultados-e-comunicados/relatorios-anuais/.

sales of equity shares. It also issued loans to some purchasers, potentially influencing the pool of buyers. For its own profit account, BNDES also organized an equity participation subsidiary (BNDESPar), enabling the bank to buy equity shares. BNDESPar offers an updated and opaque avenue for public-sector ownership of firms.[70] As an agency of the federal government and a state-owned enterprise, BNDESPar instituted a strategy of investing in "national champions." Petrobras is the largest "champion" in which the bank has invested. BNDESPar is the largest single owner of Petrobras's preferred and ordinary equity (excluding the federal government's mandated majority ownership of ordinary shares.) BNDESPar notably increased its shareholding during 2010, as a major purchaser of the US$69.6 billion share issue on the New York Stock Exchange.[71] At the end of 2012, the national Treasury and BNDES combined owned 60 per cent of Petrobras's ordinary shares and 46 per cent of all shares (see figures 9.5a and 9.5b).[72]

Protecting Petrobras's share of the petroleum market (at less than 100 per cent), building an ownership position through the development bank, and contractual commitments to local content are modified forms of industrial policy, which allow for a wider range of participants than policy had accommodated in earlier years. These tools sacrifice the intent of macroeconomic regime change formalized in the Constitution of 1988 and its 1995 amendment for petroleum. Similarly, Petrobras's share in development and production consortia circumvents requirements for competitive public bidding for all government contracts, giving the firm the ability to veto any project for any reason. The state makes the case that exemptions for national strategic interests cover the special conditions accorded to Petrobras.[73]

Conclusion

This chapter has considered that, with a short interlude from the late 1990s through the first decade of the twenty-first century, the issues accompanying the development of the petroleum sector in Brazil have never been solely concerned with petroleum. Oil and Petrobras, the vehicle that the Brazilian state created as its conduit, were central to a much broader industrial policy. This position was explicit from the 1950s through the early 1990s; since the discovery of the pre-salt deposits, a return to activist industrial policy has occurred more circuitously. Early practices favouring Petrobras and emphasizing the economic development effects of local content have re-emerged, if in somewhat different forms. Petrobras's use as a tool of macroeconomic policy has waned; while using the National Development Bank as a means to capitalize the firm has become common practice. Explicit rent-seeking is new. Prior to discovering the pre-salt deposits, the state's objectives with petroleum were development and self-subsistence; the beneficiaries of the managed industry were recipients of less expensive and more secure (if artificially managed) supplies. The potential of significant wealth has ignited the state's interest in expanding its take from pre-salt production: increased royalties, instituting profit-sharing, and signing bonuses. At the same time, social conflict over the allocation of future royalties has evolved into a game of political football.

If the goals of governance practices are to establish consistent and transparent "rules of the game," recent Brazilian experience deserves attention. The industrial policy aspects of recent regulation are as opaque as their predecessors. The rent-seeking practices are transparent, even if the expedient of separating the practices for pre-salt and traditional production sacrifices the concept of consistency. Further, situating the profit-seeking portion of the government's oil activity (PPSA) within the regulatory agency (ANP) raises important questions about regulatory independence and the potential for conflicts of interest. Beyond the scope of this chapter, ongoing practices and political contestation, since 2010, suggest that the struggle for regulatory practice and business control within the sector continues, and reflects the experiences of other sectors.[74]

Over the long run, Brazil's success as an oil producer in the pre-salt sector will rely on a wide array of factors. Some considerations, especially global oil price trends and the emergence of alternative sources of supply (such as shale oil), are outside of the control of the Brazilian government. However, the challenges presented by governance concerns will determine both whether other participants in the industry are willing to operate within Brazil and whether Brazilians can accommodate the range of claimants on the sector's potential wealth.

The relevant conclusion from this analysis is neither that state management of production nor market-oriented management offer better governance mechanisms. Rather, the inconsistency of seeking maximum returns through market-based institutions while also implementing strong policies of state management has resulted in inconsistent regulatory structures and uncertainty, and it has (perhaps) facilitated corruption. The governance framework for the pre-salt deposits is also not in accord with the intent of the Brazilian Constitution or its amendment for petroleum. This dissonance has not been specifically addressed by political, legislative, or judicial bodies.

NOTES

This chapter draws heavily on Gail D. Triner, "Regulatory Regimes for Petroleum Production in Brazil," in *Regulation of Natural Resources since 1830*, ed. Pål Thonstad Sandvik and Espen Storli, 139–61 (Vancouver: UBC Press, 2019).

1 Brazil is not unique; some authors see a general re-emergence of "resource nationalism" throughout Latin America. See Allyson Lucinda Benton, "Political Institutions, Hydrocarbons Resources and Economic Policy Divergence in Latin America" (paper presented at the annual meeting of the American Political Science Association, Boston, 28–31 August 2008).

2 See, for example, Thad Dunning, *Crude Democracy: Natural Resource Wealth and Political Regimes* (New York: Cambridge University Press, 2008); Michael L. Ross, *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations* (Princeton, NJ: Princeton University Press, 2012); Terry Lynn Karl, *The Paradox of Plenty: Oil Booms and Petro-states* (Berkeley: University of California Press, 1997); Steven Lee Solnick, *Stealing the State: Control and Collapse in Soviet Institutions* (Cambridge, MA: Harvard University Press, 1998); Benjamin B. Smith, *Hard Times in the Lands of Plenty: Oil Politics in Iran and Indonesia* (Ithaca, NY: Cornell University Press, 2007).

3 Jeffrey G. Williamson, *Trade and Poverty: When the Third World Fell Behind* (Cambridge, MA: MIT Press, 2011), chs. 1 and 4.

4 Luiz Carlos Bresser-Pereira, "Desindustrialização e doença holandesa," *Folha de S.Paulo*, 9 April 2007; Luiz Carlos Bresser-Pereira, "Taxa de câmbio, doença holandesa, e industrialização" (paper presented at Seminário patrocinado por FGV Projetos e pela Escola de Economia de São Paulo da Fundação Getúlio Vargas, São Paulo, 2010). Evidence is also accumulating that increased oil revenues (especially royalties) are not resulting in increased local standards of living. See Francesco Caselli and Guy Michaels, "Do Oil Windfalls Improve Living Standards? Evidence from Brazil" (working paper, London School of Economics, London, 2012).

5 Rapid, ongoing adjustments in the regulatory parameters of the petroleum sector, in response to material, business, and political actions, make it infeasible to declare the subject "closed"—or even up-to-date.

6 See, for example, Rafael Rosas, "Lobão defende mudança na legislação do setor de petróleo para aumentar repasses ao Governo," *Valor Econômico*, 17 April 2008.

7 José Luciano de Mattos Dias and Maria Ana Quaglino, *A questão do petróleo no Brasil: Uma história da Petrobrás* (Rio de Janeiro: CPDOC/SERINST Fundação Getúlio Vargas—Petrobras, 1993).

8 Peter Seaborn Smith, "Petrobrás: The Politicizing of a State Company, 1953–1964," *Business History Review* 46, no. 2 (1972): 183–201.

9 Getúlio Vargas, "Discurso em Leopoldina, Minas, 24 Outubro 1939," in *A política nacionalista do petróleo no Brasil* (Rio de Janeiro: Tempo Brasileiro, 1964), 54–5.

10 Brazil. Congresso Nacional, "Coleção das Leis e Decretos," Lei 2004 (3 October 1953). The law was first introduced for debate in the Congress in 1951, and the final version included such additional provisions as the ability to expropriate land deemed necessary for petroleum exploration.

11 Edelmira del Carmen Alveal Contreras, *Os desbravadores: A Petrobrás e a construção do Brasil industrial* (Rio de Janeiro: Relume Dumará/ANPOCS, 1993), 71.

12 See Gail D. Triner, *Mining and the State in Brazilian Development* (London: Pickering and Chatto, 2011), chs. 5 and 7. According to Mario Bittencourt Sampaio, a major participant in drafting the Petroleum Law of 1953, neither the Conselho Nacional de Petróleo (National Petroleum Council) nor the Treasury believed that sufficient capital could be accumulated from domestic sources to finance a successful petroleum enterprise. Mario Bittencourt Sampaio, interview by Cláudia Maria Cavalcanti de Barros Guimarães and Maria Ana Quaglino, 16 September 1987, Centro de Pesquisa e Documentação de História Contemporânea do Brasil/Fundação Getúlio Vargas (CPDOC/FGV), Memória do setor petrolífero no Brasil: A história da Petrobrás, 13–14, http://www.fgv.br/cpdoc/historal/arq/Entrevista174.pdf; Maria Antonieta P. Leopoldi, "O difícil caminho do meio: Estado, burguesia e industrialização no Segundo Governo Vargas (1951–1954)," in *Vargas e a crise dos anos 50*, ed. Angela de Castro Gomes (Rio de Janeiro: Relume Dumaná, 1994), 178.

13 A very small portion of shares remained in the hands of private owners and was tradable on the stock exchange.

14 Hsu Yuet Heung O'Keefe, *A crise do petróleo e a economia brasileira* (São Paulo: Instituto de Pesquisas Econômicas, 1984).

15 The first offshore discoveries came in 1968. See Humberto Quintas and Luiz Cezar P. Quintans, *A história do petróleo no Brasil e no mundo* (Rio de Janeiro: IBP/Freitas Bastos Editora, 2009), 70.

16 Ilmar Penna Marinho Jr., *Petróleo: Política e poder—um novo choque do petróleo?* (Rio de Janeiro: José Olympio Editora, 1989), 389.

17 Brian W. Blades, "Production, Politics, and Pre-salt: Transitioning to a PSC Regime in Brazil," *Texas Journal of Oil, Gas and Energy Law* 7, no. 1 (2011): 32. Updated estimates offer a similarly wide range, reflecting the continuing exploration activity.

18 Brazil. Agência Nacional de Petróleo (ANP), *Anuário Estatístico* (Rio de Janeiro: ANP, 2014).

19 See Juarez Távora, "O Código de Minas e o desenvolvimento da mineração no Brasil," *Geologia e Metallurgia* no. 14 (1956): 164–5; CPDOC/FGV: ANc 1928.0202, letter to Goés Monteiro from Monteiro Lobato, 3 May 1940.

20 Maria Augusta Tibiriçá Miranda, *O petróleo é nosso: A luta contra o'entreguismo,' pelo monopólio estatal, 1947–1953, 1953–1981* (Petrópolis: Vozes, 1983), 28.

21 Paulo Roberto de Almeida, "Monteiro Lobato e a emergência da política do petróleo no Brasil," in *Potência Brasil: Gás natural, energia limpa para um futuro sustentável*, ed. Omar L. de Barros Filho and Sylvia Bojunga (Porto Alegre: Laser Press, 2008), 14.

22 Thomas J. Trebat, *Brazil's State-Owned Enterprises: A Case Study of the State as Entrepreneur* (Cambridge: Cambridge University Press, 1983), 42; Luis Cezar P. Quintans, *Contratos de petróleo: Concessão e partilha—propostas e leis para o Pré-sal* (Rio de Janeiro: Benício Biz/Instituto Brasileiro de Petróleo, 2011), 77.

23 In this role, development and production of ethanol became a Petrobras project. See Penna Marinho Jr., *Petróleo: Política e poder*, 366.

24 Petrobras, "Relatório Anual/Annual Report" (Rio de Janeiro: Petrobras, 1999), http://www.investidorpetrobras.com.br; Alveal Contreras, *Os desbravadores*, 72–100.

25 Laura Randall, *The Political Economy of Brazilian Oil* (Westport, CT: Praeger, 1993); Dias and Quaglino, *A questão do petróleo no Brasil*.

26 For a discussion of the macroeconomic problems created by the oil shocks and the concurrent management of the economy, see Albert Fishlow, "Lessons from the Past: Capital Markets during the Nineteenth Century and the Interwar Period," *International Organizations* 39, no. 3 (1985): 381–439; Werner Baer, *The Brazilian Economy: Growth and Development*, 4th ed. (Westport, CT: Praeger, 1995).

27 These contracts usually provided for technology transfer and personnel training. CPDOC/FGV, Memória do setor petrolífero, Artur Levy, interview by Valentina da Rocha Lima and Margareth Guimarães Martins, 24 July 1987, 92–8; Antonio Seabra Moggi, interview by José Luciano de Mattos Dias e Margareth Guimarães Martins, 5 February 1988, 40–79, 2 March 1988, 129–30, 31 August 1988, 259–61.

28 Fausto Cupertino, *Os contratos de risco e a Petrobrás: O petróleo é nosso e o risco deles?* (Rio de Janeiro: Civilização Brasileira, 1976), 15–18.

29 Luiz Cezar P. Quintans, *Direito do petróleo: Conteúdo local—a evolução do modelo de contrato e o conteúdo local nas atividades de E&P no Brasil* (Rio de Janeiro: IBP/Freitas Bastos Editora, 2011), 29–31, 50.

30 Getúlio Carvalho, *Petrobras: Do monopólio aos contratos de risco* (Rio de Janeiro: Forense-Univeristária, 1977).

31 Armando Castelar Pinheiro and Fabio Giambiagi, "The Macroeconomic Background and Institutional Framework of Brazilian Privatization" (paper presented at the conferece Privatization in Brazil: The Case of Public Utilities, Rio de Janeiro, 1999).

32 The new Constitution supported the re-emergence of civilian rule after the military regimes of 1964–85.

33 Brazil, "Constituição da República Federativa do Brasil" (5 October 1988), article 176, http://pdba.georgetown.edu/Constitutions/Brazil/brazil88.html. On petroleum, see Cláudio A. Pinho, *Pré-sal: História, doutrina e comentários às leis* (Belo Horizonte: Editora Legal, 2010), 29.; see also William Freire, *Comentários ao Código de Mineração* (Rio de Janeiro: Aide Editora/Comércio de Livros, 1995), 168; Gilberto Bercovici, *Direito econômico do petróleo e dos recursos minerais* (São Paulo: Editora Quartier Latin do Brasil, 2011), 244.

34 Constitutional amendment 09 (9 November 1995) and the Petroleum Law enabled the constitutional amendment (Lei 9478, 6 August 1997). Amaury de Souza and Carlos Pereira, "A flexibilização do monopólio do petróleo no contexto das reformas dos anos 1990," in *Petróleo: Reforma e contrarreforma do setor petrolífero brasileiro*, ed. Fabio Giambiagi and Luiz Paulo Vellozo Lucas (Rio de Janeiro: Elsevier, 2013), 50.

35 To date, only one Brazilian company has engaged in oil exploration (OBX, primarily owned by Eike Batista; it declared bankruptcy in 2013), although a number of Brazilian firms participate in many aspects of petroleum servicing.

36 Paulo Valois Pires, *A evolução do monopólio estatal do petróleo* (Rio de Janeiro: Editora Lumen Juris, 2000), 129; Edna Maria B. Gama Coutinho et al., "O que mudou na indústria do petróleo?," *Informe Infra-estrutura: Área de projetos de infra-estrutura* no. 29 (December 1998): 3–4; Ricardo Pinto Pinheiro, *Abastecimento nacional de combustíveis no ambiente de flexibilização do monopólio de petróleo* (Rio de Janeiro: Ministério de Minas e Energia, 1996).

37 Henri Philippe Reichstul, interview with author, 11 June 2012, São Paulo. In order to issue ADRs on the New York Stock Exchange, foreign firms must comply with the financial disclosure requirements of the US Security and Exchange Commission and meet US GAAP (generally accepted accounting practices) standards.

38 Lei 12351, 22 December 2010; Congresso Nacional, "Coleção das Leis e Decretos."

39 Legal debates sometimes challenged the exact nature of the state's claim to concession granting authority, but the practices involved remained constant, with the exception of the forty-three-year period when subsoil rights were conjoined to the rights of land ownership (1891–1934). See Triner, *Mining and the State*, ch. 2.

40 All existing concessions have been grandfathered; profit-sharing will apply to future operations. The new principles for allocating rights also ignore that many analysts believed that the concessionary system was successful. Luiz Paulo Vellozo Lucas asserts that "there was a consensus in the technical sphere that reform was not necessary."See Vellozo Lucas, "A derrota de um modelo de successo," in *Petróleo: Reforma e contrarreforma do setor petrolífero brasileiro*, ed. Fabio Giambiagi and Luiz Paulo Vellozo Lucas (Rio de Janeiro: Elsevier, 2013), 139; see also Adriano Pires and Rafael Schechtman, "Os resultados da reforma: Uma estratégia vencedora," in *Petróleo: Reforma e contrarreforma do setor petrolífero brasileiro*, ed. Fabio Giambiagi and Luiz Paulo Vellozo Lucas (Rio de Janeiro: Elsevier, 2013).

41 Paulo César Ribeiro Lima, *Pré-Sal: O novo marco legal e a capitalização da Petrobras* (Rio de Janeiro: Synergia Editora, 2011), 30.

42 Ernst & Young, *Global Oil and Gas Tax Guide 2014* (London: EY, 2014).

43 José Roberto Rodrigues Afonso and Sérgio Wulff Gobetti, "Rendas de petróleo no Brasil: Alguns aspectos fiscais e federativos," *Revista do BNDES* 15, no. 30 (2008): 231–69.

44 Brazil, "Constituição 1988," Lei 12531/2010.

45 Harold Hotelling, "The Economics of Exhaustible Resources," *Journal of Political Economy* 39, no. 2 (1931): 137–75.

46 Currently, 79 per cent of proven reserves are located in the deposits attributed to the territorial area of the state of Rio de Janeiro. Gobetti makes the case that Brazil is unique among federally organized oil-producing states in allocating such a heavy proportion of royalties from offshore locations to sub-sovereign localities. Agência Nacional de Petróleo, *Anuário Estatístico*, Table 2.4; Sérgio Wulff Gobetti, *Federalismo fiscal e petróleo no Brasil e no mundo*, Texto para discussão #1669 (Brasília: Instituto de Pesquisa Econômica Aplicada IPEA, 2011).

47 Gobetti, "Federalismo fiscal"; José Roberto Rodrigues Afonso and Sérgio Wulff Gobetti, "Rendas de Petróleo no Brasil: Alguns Aspectos Fiscais e Federativos," *Revista do BNDES* 15, no. 30 (2008): 231–69. These provisions have not been implemented as of April 2015.

48 Lei 12734 (2012); Fernanda Fernandes Maia, Denise Cunha Tavares Terra, and Ludmila Gonçalves da Matta, "A nova sistema de partilha dos royalties do petróleo: Avaliando o debate na mídia," *Petróleo Royalties & Região* 12, no. 45 (2014): 4–7.

49 Sandra Manfrini, "Lei que destina royalties do petróleo para educação e saúde é publicada" *O Estado de São Paulo*, 10 September 2013, http://economia.estadao.com.br/noticias/negocios,lei-que-destina-royalties-do-petroleo-para-educacao-e-saude-e-publicada,164282; Ângela Bittencourt, "Petrobras, A polivalente" *Valor Econômico*, 23 September 2013, http://www.valor.com.br/valor-investe/casa-das-caldeiras/3476316/petrobras-polivalente.

50 Lei 12304 (2 August 2010).

51 PPSA assumes the commercial and price risks of the petroleum received as the state's share of profit. The company appoints one-half of the operating oversight committee for each pre-salt consortium, including the president of each committee, who has veto power on the committee's decisions. Ministério das Minas e Energia, "Novo Marco Regulatório: Pré-sal e áreas estratégicas," (Rio de Janeiro, 2009), 24; Quintans, *Contratos de petróleo*, 99.

52 Fernando Facury Scaff, "Impasses Regulatórios do Pré-Sal e o Plano de Negógios da Petrobras," *Petróleo Royalties & Região* 12, no. 46 (2014): 6–7.

53 Ribeiro Lima, *Pré-Sal*, ch. 3; Antônio Luís de Miranda Ferreira, "Problemas e inconsistências jurídicas de novo marco regulatório: A ótica dos princípios constitucionais da livre iniciativa, da economia de mercado e do direito comercial," in *Petróleo: Reforma e contrarreforma do setor petrolífero brasileiro*, ed. Fabio Giambiagi and Luiz Paulo Vellozo Lucas (Rio de Janeiro: Elsevier, 2013), 185–6.

54 Quintans, *Contratos de petróleo*, 98; Blades, "Production, Politics, and Pre-salt," 38–41.

55 Ferreira, "Problemas e inconsistências jurídicas de novo marco regulatório."

56 Lei 12276 (30 June 2010).

57 An outside valuation determined the signing bonus that Petrobras paid to the state. The value of the "signing bonus" was determined on the basis a forty-year contract and an estimated value for the undrilled oil of US$8.51 per barrel of oil equivalent. While advocates for state intervention in petroleum believed the state's compensation was too low, financial analysts opined that Petrobras had overcompensated the state for the transaction. To finance the signing bonus, firm expansion and technological development necessary for large-scale access to the pre-salt, Petrobras issued equity, for a value of US$69.6 billion on the New York Stock Exchange in September 2010, the largest equity issue in global stock exchange history. Petrobras, "Relatório anual/ Annual Report," 2010.

58 The stated purpose of expanding the exclusive concession is to accelerate the development of unexpectedly rich reserves in the Libra Field. "CNPE Ruling Brings Uncertainty to the Exploration and Production Market," *International Law Office Newsletter*, 26 August 2014, http://www.internationallawoffice.com/newsletters/detail.aspx?g=246b85e4-40a1-4736-b40a-bd15ab5c0483; Adriano Pires, "É preciso tirar a Petrobrás do palanque," *O Estado de São Paulo*, 14 Jul 2014, http://economia.estadao.com.br/noticias/geral,e-preciso-tirar-a-petrobras-do-palanque-imp-,1528294.

59 Lei 12351 (22 December 2010). Conceivably, the veneer of open competitive bidding for production sites could be maintained by the firm participating in multiple consortia competing for a particular concession, but this preference ensures a dominant position for Petrobras.

60 Mansueto Almeida, Renato Lima de Oliveira, and Ben Ross Schneider, *Política industrial e empresas estatais no Brasil: BNDES e Petrobras*, Texto para discussão 2013 (Brasília: IPEA, 2014), 20–5.

61 Local, or domestic, content is the share of production inputs (goods, services, labour) that a firm obtains from domestic, rather than imported, sources.

62 Every year in its Annual Report, Petrobras cites the extent of its local content and calculates its contribution to the federal Treasury. Petrobras, "Relatório anual/Annual Report" (various years).

63 Blades, "Production, Politics, and Pre-salt," 50–1. While the CNPE and the production-sharing law define the term "local content" with respect to pre-salt operations, the ANP has the authority to determine the level of the requirement.

64 Perhaps the most contentious application of local content considerations have occurred with respect to the efforts of Brazilian industry and the navy to develop floating production, storage, and offloading facilities, rather than contracting for existing technology and production from British and South Korean providers.

65 Quintans, *Direito do petróleo: Conteúdo local*.

66 Almeida, Lima de Oliveira, and Schneider, "Política industrial e empresas estatais no Brasil."

67 Quintans, *Direito do petróleo: Conteúdo local*; João Augusto de Castro Neves (Eurasia Group), interview with author, 9 November 2012, Washington, DC.

68 Ron Bousso, "Galp Sees Delays in Brazil from Petrobras Graft Probe," *Reuters*, 11 March 2015, http://www.reuters.com/article/email/idUSL5N0WD3KO20150311. The scandal has also seriously impeded the functioning of the federal government. As of mid-March 2015, fifty-four accused participants have been arrested and large mass demonstrations are calling for the impeachment of the president of Brazil. See Simon Romero, "Protests Continue in Brazil against Dilma Rousseff," *New York Times*, 17 March 2015.

69 Rafael Rosas, "Petrobras reitera que não há data definida para divulgação de balanço," *Valor Econômico*, 2 April 2015.

70 For more on this topic, see Sérgio G. Lazzarini and Aldo Musacchio, *Reinventing State Capitalism: Leviathan in Business, Brazil and Beyond* (Cambridge, MA: Harvard University Press, 2014), ch. 9; Almeida, Lima de Oliveira, and Schneider, "Política industrial e empresas estatais no Brasil."

71 This share issuance was intended to finance the signing bonus for the exclusive concession and the research and development necessary to access the pre-salt developments. This issuance was the largest offering in global financial history, to that point.

72 The end of 2012 was chosen as the benchmark year because it is prior to any emerging rumours of the kickback scandal.

73 Blades, "Production, Politics, and Pre-salt," 42.

74 Government regime change has impacted the pre-salt petroleum sector by eliminating mandatory participation by Petrobras, reducing local content requirements, and reducing profit-sharing requirements. The durability of these changes has yet to be proven. On the regulatory similarities among sectors, see Gail D. Triner, "From Regulatory State to Entrepreneurial State? Brazilian Political Economy in the Wake of Privatization" (paper presented at the XVIII World Economic History Congress, Cambridge, MA, 1 August 2018).