PETROLEUM IN BRAZIL:
Petrobras, Petro-Sal, Legislative Changes & the Role of Foreign Investment

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Introduction

On November 8, 2007, the state-owned Petróleo Brasileiro S/A (Petrobras) announced that it had discovered a “monstrous” reserve of light oil in the Tupi field of the Santos basin, off the coast of southern Brazil. A day later it removed 41 adjacent exploration blocks from a scheduled government concession auction to reanalyze how to best exploit the new resources.[1] Since opening its petroleum industry in 2007, Brazil has attracted hordes of foreign corporations and created hundreds of thousands of jobs. In 2009 President Lula proposed sweeping changes to the industry in the form of four bills that would greatly increase the government’s involvement and relegate foreign oil companies to the role of “subservient partners.” In that same year, Petrobras successfully executed a public stock offering worth almost $79 billion (bn). Yet despite the largest public offering in history and tens of billions of barrels in proven and expected reserves, analysts at Credit Suisse and Deutsche Bank, among others, have downgraded Petrobras’ investment rated to “neutral” and “hold,” respectively. Despite incredible potential, uncertainty over the potential increase in government control, over-ambitious targets, infrastructural bottlenecks, technological capabilities, and corruption loom large for potential Petrobras investors and business partners worldwide. The huge pre-salt oil deposits will have considerable implications for Brazil’s international role, its domestic governance, regional balances of power, and the future of investment in the region. This paper will analyze the evolution and current state of the Brazilian petroleum industry, the integral role of Petrobras, and implications for international firms and investors; it will argue that recent government decisions will impede the ability of Petrobras and the petroleum industry to rapidly develop and reach

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[1] Joshua Schneyer, "Brazil, the New Oil Superpower," Bloomberg Businessweek 11/17/2007. Google News. 12/1/2010. <http://www.businessweek.com/bwdaily/dnflash/content/nov2007/db20071115_045316.htm?chan=top+news_top+news+index_businessweek+exclusives>.

production goals in the pre-salt fields, but with the *potential* to considerably benefit national development.

Doing Business in Brazil

The World Bank and the International Monetary Fund rank Brazil 129th of 183 in terms of overall "Ease of Doing Business," worse than regional competitors Argentina (118), Mexico (51), and Chile (49).[2] The Economist Intelligence Unit laments that the nation's "cumbersome bureaucracy…often impedes private-sector development" and that fiscal spending and the role of the state in the economy have both risen a great deal since 2003. Transparency International ranked Brazil 75th of 180 in its 2009 Corruption Perception Index.[3] The World Bank ranked Brazil the 11th worst of 130 countries in social inequality (based on Gini Index).[4] Yet, despite these dismal statistics, the economy grew in the first half of 2010 at its fastest rate in 14 years.[5] GDP is expected to grow 7.5 and 4.5 percent in 2010 and 2011, respectively[6]. Further, inflation has been trending downward (although recently blipping up), fiscal policy is sound, and the PRS five-year investment forecast predicts low levels of risk.[7]

Brazil, the ninth largest economy in the world with a population of 190 million, is no longer the country of meteoric inflation rates, economic uncertainty, and fiscal irresponsibility as it had been characterized during the 1980s and early 1990s. President Lula has essentially perpetuated the successful fiscal policy of his predecessor, Fernando Henrique Cardoso, while

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[2] The World Bank Group, Doing Business 2010: Brazil (2009) 2 <http://www.doingbusiness.org/Documents/CountryProfiles/BRA.pdf>.
[3] Economist Intelligence Unit. "Political/Commercial Background: Brazil." Country Commerce (2010) 5-19. 10/5/2010.
[4] The World Bank Group, World Development Indicators, 2010, 11/3/2010 <http://data.worldbank.org/data-catalog/world-development-indicators>.
[5] Economist Intelligence Unit, 14
[6] Fick, Jeff. "Brazil Stock Closes Lower as Early Optimism Fades." Wall Street Journal. 12/7/2010, sec. Business. 12/7/2010.
[7] PRS Group, Inc. "Country Conditions," Political Risk Yearbook: Brazil Country Report (2010) 4.

expanding select social entitlements; President-elect Dilma Rousseff is expected to follow this model as well. Corruption remains a serious concern, as does burdensome regulation, high tax and tariff rates, and infrastructural bottlenecks, but the nation has seen some progress on all of these fronts.

Regardless of the aforementioned problems, deep penetration of foreign corporations has been a matter of course in Brazil for decades—a divisive political issue since the populist presidency of Getúlio Vargas.[8] While Brazil is hardly the easiest country for foreign investors and corporations, its large market and abundant room for growth is irresistible to FDI. Laws passed in 1993 and 2008 allowing the private ownership of ports and expanding the rights for private concessions, respectively, are examples of efforts Brazil is making in liberalizing its economy, but must still be fully implemented.[9] In 2009, US-Brazilian combined trade exceeded $63bn and is expanding rapidly, as is Brazilian trade with China and with regional partners. An example of the potential for foreign investment is the automotive industry, where foreign automakers, using local assembly plants, nearly monopolize the domestic market—Fiat, GM, VW, and Ford have a combined 71.2 percent market share.[10]

History of the Petroleum Industry in Brazil: Nationalization, Petrobras and FDI

In 1938, President Getúlio Vargas created the National Petroleum Council (CNP – *O Conselho Nacional do Petróleo*) to increase state control over the budding industry using the slogan “the petroleum is ours” (*O petróleo é nosso*). On October 3, 1953, he furthered this goal

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[8] Ronaldo Munck, "State Intervention in Brazil: Issues and Debates," Latin American Perspectives 6.4, Brazil: Capitalist Crisis and Workers' Challenge (1979).
[9] Brazilian Ministry of External Relations, Brazilian Ports: A Safe Haven for International Investment, November 2008, 10/16/2010.
<http://www.braziltradenet.gov.br/ARQUIVOS/Publicacoes/Periodicos/PUBRevistaBrasilMEPortosI.pdf>.
[10] Brazil-U.S. Business Council, Policy, Trade, Economy Data, 2010, 11/3/2010.
<http://www.brazilcouncil.org/information-brazil/policy-trade-economy>.

by signing Law 2,004. The law created Petrobras, a state-owned enterprise (SOE) overseen by the CNP, and granted it a legal monopoly in hydrocarbon exploration and production (E&P). Additionally, it allowed Petrobras to control a large share of refining and corollary industries. The firm received a fixed price for output and faced limited market pressure. As a result, over time it became a sprawling conglomerate: overstaffed and inefficient compared to private sector peers.

While private sector enterprises are generally more profitable than their public counterparts, Petrobras has been a consistently profitable company and considered successful in relation to other Brazilian and foreign state-run enterprises.[11] However, this "success" must be qualified by the fact that in the mid-1970s, Brazilian public firms showed, on average, one half the rate of return of private firms and by the mid-1980s public enterprises accounted for two-thirds of the nation's external debt. The bloated public sector crowded out private investment and helped contribute to the fiscal instability of the 1970s, 1980s, and 1990s.[12]

By 1961, national refining capacity exceeded consumption for the first time, but production still lagged and the nation remained a net importer of oil.[13] In 1964, under the new military regime, Petrobras first contracted foreign firms to assist in and expand offshore exploration to boost production. Five years later, the first offshore field was discovered. However, this progress was not rapid enough. As a net oil importer, Brazil was severely impacted by the 1973 and 1979 global oil crises. In that decade it established an international subsidiary, Braspetro, to explore in the Middle East, North Africa, and Colombia, but these

[11] Mahmood A. Ayub and Sven O. Hegstad, "Management of Public Industrial Enterprises," The World Bank Research Observer 2.1 (1987) 82.
[12] Ayub and Hegstad, 85
[13] Armando Costa, "A trajetoria de internacionalização de Petrobras na industria de petroleo e derivados," História econômica & história de empresas 12.1 (2009): 12

ventures failed to produce profitable results and Braspetro folded. The CNP also briefly allowed foreign companies to explore within Brazilian territory under "risk contracts," but they failed to make any discoveries and desisted. Petrobras instead decided to invest heavily in research and development (R&D) and in the 1980s production rose dramatically; by the 1990s Petrobras was considered "the undisputed world leader in deep and ultra-deep offshore" E&P.[14]

Petrobras has been able to remain successful in large part due to (i) its investments in technology and (ii) managerial and political independence from the national government. It has relied heavily on R&D and use of foreign technology to develop its operations and to push exploration further offshore. It created the Center for Petroleum Research and Improvement (Cenap – *o Centro de Aperfeiçoamento e Pesquisas de Petróleo*) in 1957 (later renamed Cenpes and allied with the Universidade Federal de Rio de Janeiro) and quickly invested tens of millions of dollars in developing technologies for offshore E&P.

In 1986, the company began the Technological Development Program for Deep Water Production Systems (Procap – *a Programa de Desenvolvimento Tecnológico de Sistemas de Produção em Águas Profundas*). These investments, when Petrobras was a much smaller player that it is currently, laid the foundation for the company's growth, propelling it into deep water reserves far offshore and increasing the profitability of extant operations. Procap led to new drilling techniques that allowed for a world record-setting depths at the Marimba field in the Campos Basin (drilling at 1,200 meters below sea level and petroleum extraction at 492 meters in 1988), floating production platforms that allowed for greater mobility in the Marlim Basin, and "Christmas Tree" connection ducts that allowed for diagonal drilling used at the Roncador

[14] Annette Hester and Jean Paul Prates, "The Eneregy Sector in Brazil: Lessons in Ingenuity and Compromise," Canadian Foreign Policy 13.2 (2006) 65-7

field in 1996 (at between 1,500 and 2,000 meters).[15] As a result, it became an industry leader in foreign and domestic offshore drilling in locations with geologically similar characteristics to its Brazilian fields in a way that the premature Braspetro could not.[16]

The company's success enabled it to enjoy relative managerial autonomy, as compared to other SOEs, like the recently dissolved Brazilian railroad company Rede Ferroviária Federal S.A. (RFFSA) and the failed steel companies Usinor and Sacilor in France. As public entities, the latter two examples were mandated to seek approval from government ministries before implementing any managerial decisions. This type of bureaucratic interference led to conflicting motivations and interests that interfered with profit motives and the core elements of financial autonomy: greater market discipline, sound financial objectives, clear and focused social objectives, elimination of reliance on subsidies, appropriate capital structure, disciplined financial relations, and the established precedent of performance measurement and incentive systems.[17] If the 1980s, marked by the foundation of Procap, was the decade of technological advance for Petrobras, then the 1990s was the decade of corporate innovation. Managerial independence was a vital component to the improvements of that decade.

After more than 40 years of nationalized monopoly, the historic Petroleum Law (Law 9,478) was passed in 1997, triggering a dramatic reformulation of the industry. The law (i) de-monopolized hydrocarbon E&P, (ii) allowed private purchase of minority participation in Petrobras, (iii) allowed private companies to participate in E&P through concessions, (iv) created both the National Agency of Petroleum, Natural Gas and Biofuels (ANP) to administer the industry and (v) the National Council for Energy Policy (CNPE) to supervise policy and

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[15] Costa, 14-16
[16] Costa, 12
[17] Ayub and Hegstad, 89

implementation. Forced to adapt to a climate with greater competition, in the 1990s Petrobras cut its workforce by just under a third and doubled its production. Under the direction of Philippe Reichstul, it admitted billions in previously undisclosed liabilities and cleaned up its books.[18] Since that time, Petrobras has excelled by continuing to develop advanced technologies and initiating many new international contracts and partnerships.

Concession Regime:

With the concession system inaugurated in 1997, international oil companies and Petrobras partake in a competitive bidding process to secure E&P rights from the CNP for parcels of ocean space for a set period of time in exchange for payment by: (1) royalties; (2) signature bonuses; (3) annual payments of a prescribed sum per Km^2 comprised in the contracted area; and (4) a special participation which is hooked to well productivity.
Companies are subject to normal taxation as well. As of 2009 only three of the top 20 oil producing nations use a pure concession-based system.

Regulatory changes were implemented gradually, allowing Petrobras time to adapt while continuing to capitalize on its inherent domestic advantage. In 2002, deregulation of oil and derivative prices further liberalized the market.[19] By 2006, thanks in part to hydroelectric power and the increased use of ethanol, Brazil became oil self-sufficient.[20] At the end of 2008, Petrobras boasted an annual net income of R$215.1bn (approximately $130bn), net profits of R$32.9bn (approximately $19bn), investments of R$53.3bn (approximately $32.3bn), production of 1.97 million barrels of petroleum per day (MMbbl/d) and 422,000 bbl/d of natural gas, 109 exploratory drilling probes, 13,174 productive wells, 112 platforms, 16 refineries, 189 ships, 5,998 retail locations, and three fertilizer factories.[21] It had grown to become one of the ten largest energy

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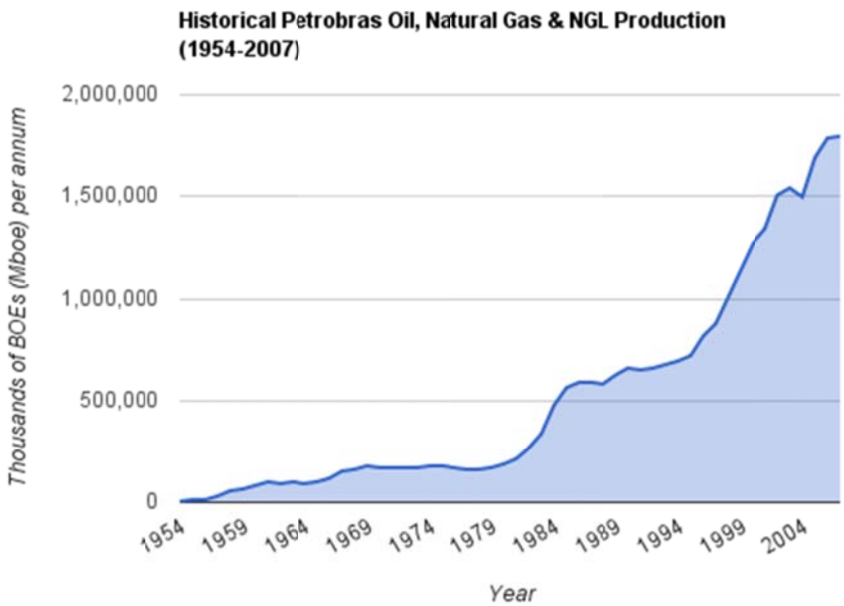
[18] "Making It Shine," Economist 355.8167 (2000) 63.
[19] Ronaldo Seroa da Motta, Amanda Aragão, and Jacqueline Mariano, "Hydrocarbons in Latin America - Case of Brazil," Instituto de Estudios Superiores de Administración, 2008, 1.
[20] Hester and Prates, 70
[21] Costa, 5

companies in the world, with operations in 28 countries and daily production has since expanded to the equivalent of approximately 2.6 MMbbl/d.[*22]



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In response to the 1997 Petroleum Law's changes to Petrobras and to its monopoly, Petrobras dramatically restructured its holdings structure. The government was required to maintain direct capital holdings below 50 percent. Two-thirds of stock in hand was opened to private capital, 40 percent of which was traded on the New York Stock Exchange (NYSE) via American Depository Receipts (ADRs). However, the government never lost its majority voting rights.[24]

Soon thereafter, in mid-2000, during the Reichstul period, Petrobras shares were merged in a reverse split at the ratio of 1:100, which increased the profitably of each share. This was

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[*] As of September 1, 2010
[22] Heller Redo Barroso "Brazil Pre-Salt: Safety and Local-Content Regulations and Technology for Brazil's Deepwater," World Oil 231.9 (2010) Business Source Premiere 11/3/2010. <http://www.worldoil.com/brazil-presalt-safety-regulations.html>.
[23] Petrobras S/A, Investor Relations Data (2010).
[24] Costa, 14

followed by another, larger public offering of 179,739,300 shares issued by the federal government, most of which was traded as ADRs. The effect was to inject large amounts of foreign capital, dilute the federal government's previous 86 percent voting share down to 58 percent, and its capital ownership from 56 to 41 percent (including BNDES' stake).

In the thirteen years since Law 9,478/97's passage, private and foreign investors have increased their stake in the company substantially (prior to the massive Wall Street public offering in September 2010, the federal government capital stock was only 39.20 percent of the total, as compared to 48 percent in 1992 and 56 percent in 1999, while foreigners and American Depository Receipts represented a combined 37.5 percent).[25]

In the past decade its price on the NYSE has risen from its nadir of $2.50 on September 27, 2002 to its apex of $72.38 on May 23, 2008 before a 2:1 split and the global economic recession that sent oil prices plummeting.[26] Freed from total state ownership, subject to investors' profit motive, and forced to compete with foreign multinational firms for contracts, Petrobras has been a strong performer in recent years. Steady foreign capital investments and rising share prices can be interpreted as the "market's approval" of the changes to corporate and management structure and faith in the future profitability of the company's expanding operations.

[25] Petrobras, Investor Relations Data
[26] Petroleo Brasileiro SA (ADR): NYSE:PBR Quotes & News, 11/17/2010. <http://www.google.com/finance?q=NYSE:PBR>.

Petrobras Capital Ownership Evolution

Shareholders	Capital Ownership (12/31/1992)		Capital Ownership (12/31/1999)		Capital Ownership (12/31/2000)		Capital Ownership (07/30/2010)	
	Shares	%	Shares	%	Shares	%	SHARES	%
Common Shares (w/ voting rights)	583,970,228	100%	63,416,841,885	100%	634,168,418	100%	5,073,347,344	100.00%
Federal Government	475,290,799	81%	53,295,374,181	84%	353,314,441	56%	2,818,751,784	55.60%
BNDESPar	11,990,150	2%	1,278,949,333	2%	12,789,493	2%	98,457,000	1.90%
American Depositary Receipts level 3	-	0%	-	0%	125,425,349	20%	1,257,461,868	24.80%
FMP - FGTS Petrobras	-	0%	-	0%	46,768,324	7%	172,241,963	3.40%
Foreigners (RES. No 2689 C.M.N)	-	0%	754,561,368	1%	18,976,952	3%	250,888,214	4.90%
other entities (1)	96,689,279	17%	8,087,957,003	13%	76,893,859	12%	475,546,515	9.40%
Preferred Shares	422,386,969	100%	45,193,566,979	100%	451,935,669	100%	3,700,729,396	100.00%
BNDESPar	-	0%	7,360,587,340	16%	74,405,873	16%	574,047,334	15.50%
American Depositary Receipts level 3 and rule 144 -A	-	0%	8,768,365,400	19%	101,586,056	22%	1,268,137,718	34.30%
Foreigners (RES. No 2689 C.M.N)	-	0%	12,485,793,175	28%	91,498,845	20%	511,130,107	13.80%
other entities (1)	422,386,969	100%	16,578,821,064	37%	184,444,895	41%	1,347,414,237	36.40%
Capital Stock	1,006,357,197	100%	108,610,408,864	100%	1,086,104,087	100%	8,774,076,740	100.00%
Federal Government	475,290,799	47%	53,295,374,181	49%	353,314,441	33%	2,818,751,784	32.10%
BNDESPar	11,990,150	1%	8,639,536,673	8%	87,195,366	8%	672,504,334	7.70%
American Depositary Receipts (Common Shares)	-	0%	-	0%	125,425,349	12%	1,257,461,868	14.30%
American Depositary Receipts (Preferred Shares)	-	0%	8,768,365,400	8%	101,586,056	9%	1,268,137,718	14.50%
FMP - FGTS Petrobras	-	0%	-	0%	46,768,324	4%	172,241,963	2.00%
Foreigners (RES. No 2689 C.M.N)	-	0%	13,240,354,543	12%	110,475,797	10%	762,018,321	8.70%
other entities (1)	519,076,248	52%	24,666,778,067	23%	261,338,754	24%	1,822,960,752	20.80%

*(1) Includes São Paulo Stock Exchange Custody and other entities. [27]

[27] Petrobras S/A, Investor Relations Data

Pre-Sal Fields & Hydrocarbon Production

With a potential cache of 10 to 16bn barrel oil equivalents (BOE) of proven reserves, the 2007 Petrobras discovery of the Tupi pre-salt oil field in the Santos basin, off the coast of Rio de Janeiro state, and subsequent discoveries in Campos and Espirito Santo may be the largest hydrocarbon finds in the Americas in the last 30 years. Exploration success rates have been extraordinarily high and industry estimates of total potential reserves are varied and speculative, some suggest that total reserves could exceed 50—or even 100—bn barrels of oil and gas in the entire 149,000 km^2 pre-salt area.[28] The find is so substantial that there has been talk of Brazil joining the ranks of the Organization of Oil Exporting Countries (OPEC).[29][30][*] Production in the Santos basin alone by 2020 could exceed Brazil's total daily output in 2007.[31] The Brazilian government, Petrobras, and related companies have been predictably animated over the discovery. However, particular conditions of the fields will make for a difficult and dangerous undertaking.[32] The pre-salt fields are located over 185 miles off the coast, four miles (6,400m) below sea level, deep beneath a three-mile (4,828m) layer of salt deposits (hence the name "pre-salt" or "sub-salt").

Similar to the technological breakthroughs, in Marimba, Marlin and Roncador by Procap, Petrobras must continue to innovate to adapt to conditions at Tupi, Guará, Iara, and other new fields. Soon after the 2007 discovery, the company launched the Pre-Salt Skills Development Program (Prodesal) and the Pre-Salt Technology Program (Prosal) to develop and improve technologies and technicians necessary to exploit the pre-salt areas. They must quickly address

[28] "Preparing to spend a 'millionaire ticket' from offshore," Economist 392.8647 (2009) 42-43.
[29] Peter Howard Wertheim, "Bullish on Brazil," Offshore 69.10 (2009) 38.
[*] However, Brazil is not yet a net oil exporter and does not plan on exporting crude oil.
[31] Wertheim, 38-48
[32] Barroso

issues such as sequestration of highly pressurized gases, the rapid heating and cooling of petroleum as it is extracted, corrosive conditions and a location far offshore, among others.[33]

With wide variation per well, most deposits are laced with unusually high levels of dangerous gases including carbon dioxide deposits in the range of eight and 18 percent and hydrogen sulfide that can damage and corrode equipment and increase the risk of explosion. These chemicals will require the development of specialized cement and metallurgy for each drilling environment. Additionally, for safety, environmental, and efficiency purposes, Petrobras and Halliburton are developing their own CO_2 capture and storage (CCS) systems to separate the CO_2 and then re-inject it into reserves and underground saline aquifers to boost recovery and limit the release of CO_2 into the environment that, in 2013 alone, would amount to 4.5 million tons.[34] Due to the many challenges ahead, the company has begun to reduce foreign operations to focus resources on the pre-salt area.[35]

Petrobras expects rapid and steady growth in its oil and gas production capacity in the next ten years, rising annually by 9.4 percent to the equivalent of 3.907 MMbbd/l by 2014 and 7.1 percent to 5.382 MMbbd/l by 2020 (nearly double its 2010 rate). These rates are significant considering that it only achieved a 4.7 percent growth rate in the previous eight years.[36] Analysts are mixed on the feasibility of such a monumental increase in production capacity (it achieved this growth rate in a shorter timeframe twice in recent history, once in the early 1980s and again in the late 1990s to early 2000s, but when the company was smaller and more focused). Historically, the company has missed its five-year production targets by 13 percent with annual

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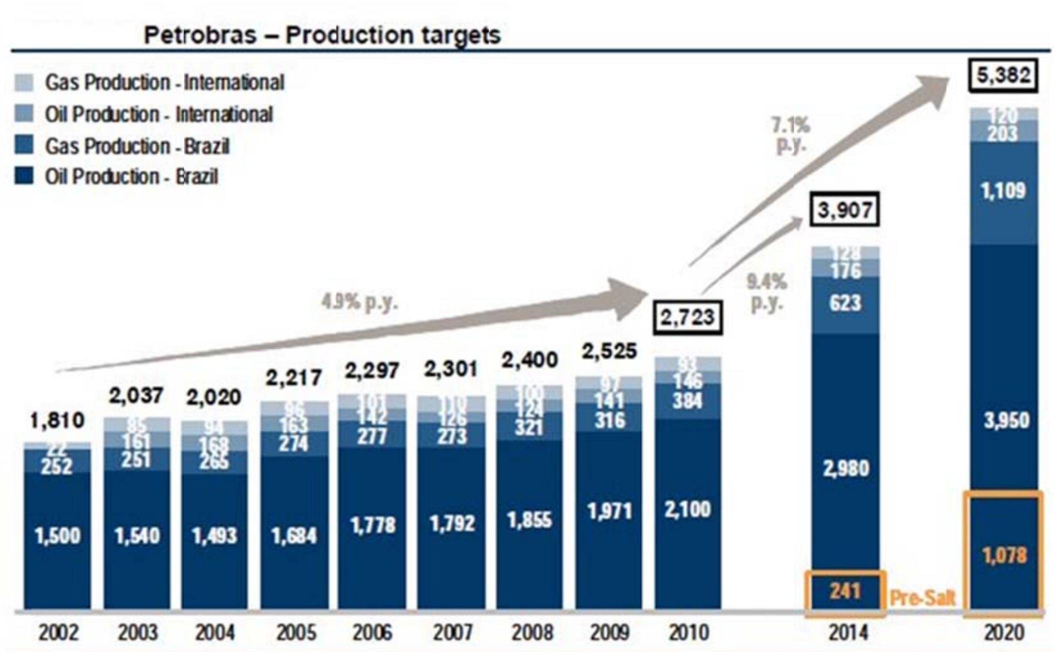
[33] "HR Innovation: A Different Approach at Brazil's Petrobras." Energy WorkForce 15.2 (2010) 4-5.
[34] Peter Howard Wertheim, "Petrobras Tests New Technologies for CO_2 Capture, Storage." Offshore 70.2 (2010) 38.
[35] Wertheim, 38-48
[36] Emerson Leite, et al, PBR: Stronger Asset Base, Diluted Investment Case Credit Suisse Latin America, (2010) 15, Thomson Research 11/5/2010.

downward revisions, leading Credit Suisse to predict its 2020 forecast to be over-inflated by 20 percent.

Among the many uncertainties ahead, the most pressing is the procurement of additional drilling rigs. A 28-rig contract is currently a year behind the 2013-2017 delivery schedule.[37] This could, however, be ameliorated by the troubles of the Mexican oil company, Pemex. Thirty-five oil rigs are sitting idle in the Gulf of Mexico as of September 2010. The owners are eagerly contacting Petrobras about moving their equipment south to work for Petrobras.[38] Yet, with high local content requirements (LCRs) and the desire to develop national production capacity, the company is rumored to be willing currently to contract out only nine of its desired 28 rigs.[39]



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[37] Leite, 15
[38] Barroso
[39] Leite, 17
[40] Leite, 15

Political, Legislative & Regulatory Changes in the Era of Pre-Salt

After the large discoveries of 2007, the Brazilian government and petroleum regulators began reeling. The ANP removed forty-one blocks adjacent to the pre-salt fields from the Round 9 concession auction scheduled for that year. After months of controversial negotiations, on August 31, 2009, President Lula sent four draft bills to Congress proposing a radical overhaul of the existing regulatory and operational structure of the petroleum industry.

- **Bill 5938/09** - The change from a concession regime to production sharing contracts (PSC) model for all un-contracted pre-salt territory
- **Bill 5939/09** - The creation of a new agency, Petro-Sal, that would oversee pre-salt PSC auctions, trading of pre-salt petroleum, and management of the Social Fund
- **Bill 5940/09 –** The capitalization of Petrobras with approval for the 5bn BOE rights transfer with a tentative value of $42.5bn in exchange for stock
- **Bill 5941/09** - The creation of a Social Fund from pre-salt profits, administered by Petro-Sal; at least 50 percent will be allocated toward education funding

As is to be expected, the legislation faced heated debate and revision. However the core of the President's proposals has been, or is expected to be, ratified by both houses of Congress. These changes are controversial for many reasons with large financial implications (both positive and negative) to federal, state and municipal government; foreign corporations; Petrobras; private investors; and the Brazilian populace.

Under the new regulatory regime, the pre-salt areas not already under concession would be the domain of the new, powerful Petro-Sal, an agency of the MME. Petro-Sal will auction PSCs, for which private companies bid by estimating "cost oil" and "profit oil" and pledging a percentage of the latter to the government, in addition to regular taxation and potential signature bonuses. Petrobras would then have to match this bid, relative to its share of the contract, which is automatically at least 30 percent. Petro-Sal has the right to veto any drilling contract and can award a contract directly to Petrobras without auction if it is deemed to be "in the public interest." Petrobras has the right to bid competitively for more than its minimum 30 percent. This system will be applied in the 78 percent of the 149,000 km^2 pre-salt area not already under concession and existing concession contracts will be honored. Autocratic regimes, such as Venezuela and Saudi Arabia, utilize PSCs, whereas most countries use some sort of mixed regulatory model. Only the USA and Canada now use a pure concession model.[41]

The profits from these agreements will be divided amongst all Brazilian states and municipalities, with a small share given to municipalities whose ports are used for the delivery and export of the petroleum. Additionally, a share of the profits will be deposited into a national Social Fund administered by Petro-Sal. Petrobras is financing its new, expanded role with the over $100bn of capital that it acquired over the last two years.

PBR: Raising Capital & Expenditure

The Brazilian Association of Industry and Machinery (Abimaq) projects that, by 2020, pre-salt oil and gas extraction will create 500,000 new jobs and finance the purchase of $211bn worth of equipment (this *excludes* economic stimulus created by complimentary industries).[42] The company has a $224bn dollar capital expenditure plan and private corporations are expected to spend between $150 and 200bn by 2020.[43][44] Petrobras has begun purchasing equipment on its

[41] "Brazil Battles the 'Oil Curse.'" Newsweek 154.15 (2009) 8-9.
[42] Wertheim, 28
[43] Chris V. Nicholson, "Petrobras Raises $70 Billion in Share Issue," New York Times 9/24/2010, sec. DealBook: . 11/10/2010. <http://dealbook.nytimes.com/2010/09/24/petrobras-raises-70-billion-in-share-issue/>.

55,000 item "preliminary shopping list" (including 550 generators, 550 derricks, 350 turbines, 700,000 tons of structural steel for platform hulls, 550 wet Christmas tree connection ducts, 500 wellheads, 80,000 pumps, 18,000 storage tanks and 4,000 km of flexible lines) to build capacity and circumvent increasing LCRs.[45]

To support the costs of future operations, Petrobras has aggressively pursued capital investment domestically and abroad. In 2009, it raised $33bn from capital markets, (including $4bn in 10-year and 30-year bond issuances), loans from BNDES, a $10bn deal with Chinese state oil firm Sinopec for which it promised a guaranteed supply of as much as 200,000 bbd/l for ten years, and other sources. It ended the year with $14bn cash-in-hand.[46][47] Yet this was only the beginning.

Number of shares issued

	Common		Preferred		Total	
Federal government	1,172,661,340	49%	66,019,279	3%	1,238,680,619	29%
BNDESPar	74,943,392	3%	767,301,432	40%	842,244,824	20%
BNDES	224,845,426	9%	-	0%	224,845,426	5%
Sovereign Fund	344,055,327	15%	161,596,958	8%	505,652,285	12%
Others	552,581,533	23%	906,341,157	48%	1,458,922,690	34%
Total	**2,369,087,018**	**100%**	**1,901,258,826**	**100%**	**4,270,345,844**	**100%**

Source: Company data [48]

On September 24, 2010, Petrobras initiated a public offering in New York and São Paulo worth $69.97bn (R$120bn)—the largest in history. The 2.4bn common (voting) and 1.9 preferred shares issued represented a 49 percent increase in total stock.[49] A large boost to its balance sheet (the net debt/net equity ratio dropped from 35 in 1Q2010 to 17 percent in 3Q2010) led share prices to post immediate gains, but the details of the share issuance were hotly contested within

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[44] Wertheim, 38
[45] Barroso
[46] "Oil and Revolution," Economist 392.8641 (2009) 35.
[47] "A Lottery Win for Petrobras." Euromoney 40.488 (2009) 10-12.
[48] Leite, 4
[49] Nicholson

the Brazilian congress. While it received a lukewarm reception by analysts from foreign investment banks, the offering was over-subscribed by eager investors.

Two-thirds of the new value was acquired by the government (via the federal government, BNDES/BNDESPar, and the Brazilian sovereign fund) including a combined 77 percent of common shares with voting rights. Government ownership has effectively increased from 40 percent (48 percent of common shares) to 48 percent (with 64 percent of common shares).[50] The Brazilian Sovereign Fund is a $20bn fund created by decree by President Lula in 2008 in anticipation of the public offering, intended specifically to purchase PBR stock and to manage the profits from offshore oil production.[51] In its analysis, Deutsche Bank stated:

> Being the controlling shareholder, the government always influenced the company's strategy. One can argue that over the past years, the government's actions towards the company and the sector have changed towards more political control, but the increased ownership post capital raise will not make the political risk more noticeable than before.[52]

Indeed, foreign analysts hope this will not increase the government's role in the coming years, but some disagree with this analysis. The method in which the government acquired most of its new shares created unease and will increase uncertainty for years.

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[50] Leite, 4-5
[51] Gerald Jeffris, "Brazil Approves Sovereign Fund, State Banks In Petrobras Capitalization," Wall Street Journal 9/9/2010, sec. Business, Google News, 11/30/2010. <http://online.wsj.com/article/BT-CO-20100909-709571.html>.
[52] Marcos Sequiera, Petrobras: Life after the R$120bn Capital Increase, Deutsche Bank - Latin America, (2010) 3, Thomson Research, 11/5/2010. <http://research.thomsonib.com/gaportal/ga.asp>.

Petrobras shareholders' structure prior and after the capital increase

mn shares	PRIOR TO CAPITAL INCREASE						AFTER CAPITAL INCREASE					
	ON	%	PN	%	Total	%	ON	%	PN	%	Total	%
Federal government	2,818.8	55.6%	0.0	0.0%	2,818.8	32.1%	3,991.4	53.6%	66.0	1.2%	4,057.4	31.1%
BNDES & BNDESPar	98.5	1.9%	574.0	15.5%	672.5	7.7%	398.2	5.4%	1,341.3	23.9%	1,739.6	13.3%
Sovereign Fund	0.0	0.0%	0.0	0.0%	0.0	0.0%	344.1	4.6%	161.6	2.9%	505.7	3.9%
Others	2,156.1	42.5%	3,126.7	84.5%	5,282.8	60.2%	2,708.7	36.4%	4,033.0	72.0%	6,741.7	51.7%
Total	**5,073.3**	**100.0%**	**3,700.7**	**100.0%**	**8,774.1**	**100.0%**	**7,442.4**	**100.0%**	**5,602.0**	**100.0%**	**13,044.4**	**100.0%**
Split ON vs. PN	**58%**		**42%**				**57%**		**43%**			
Increase in shares							**47%**		**51%**		**49%**	

Source: Deutsche Bank and company reports.

[53]

The 5bn BOE, $42.5bn Rights Transfer

In exchange for the full production rights to 5bn BOE in select areas of the Tupi Sul, Tupi Northeast, Guara East, and Iara fields, Petrobras agreed to pay the Brazilian government $42.5bn (R$74.8bn). This negotiated figure implies a value per barrel of $8.51/BOE, with a final re-valuation based on changes to productivity and market price projections at the onset of commercial production.[54] This is well above the $5-6/BOE expected by most analysts. The firm received no actual capital in the deal and gave the government $42.5bn in shares from the $69.97bn September 2010 stock issuance to finance the purchase. The firm will pay royalties on the oil, but will not be required to pay the Special Participation Tax of as much as 40 percent of profits. Petrobras expects drilling operations in these fields to recoup the value of its purchase over a 40-year period (with a possible 5 year extension) beginning with the commencement of full-scale production operations, but at such a high price tag, these will be the most highly leveraged BOE in the company's portfolio. Credit Suisse analysts have cited this agreement as a major cause of its reducing Petrobras' investment rating to "neutral" and criticized the deal for three principal reasons:

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[53] Sequiera, 4
[54] Sequiera, 3-4

(i) the real discount of 8.83% used to value the assets, while in line with the company's cost of capital, is well below the returns it could obtain from other upstream investments…diluting overall returns,

(ii) the production curves used in the valuation are unrealistic when considered that these projects will not be developed on a standalone basis, given Petrobras' bottlenecks to develop existing assets, and

(iii) the revaluation of the assets, to take place once full-scale commercial production is declared, adds uncertainty to the story and reduces the company's leverage to oil prices. [55]

The deal is perceived by Credit Suisse to be calculated on flawed value and production estimates that grant the government overly-favorable terms. The negotiations relied upon independent appraisals by Gaffney Cline and DeGolyer & MacNaughton that produced value estimates of $10.00 and $6.50/BOE respectively. Despite historically very aggressive production targets by Petrobras, these two analyses overshoot internal targets for 2020 by 18 to 25 percent and suggest that the company would be unable to meet these goals without diverting limited resources from other planned projects and thereby harming potential earnings companywide. At a 10 percent discount rate and a production timetable that is two years slower than that of the more cautious D&M analysis, Credit Suisse instead believes $5.70/BOE to be a more appropriate price, two-thirds of the agreed upon rate.[56]

The doubt over Petrobras' ability to achieve its production targets is compounded by the fiscal uncertainty created by the revaluation that will most likely not occur until 2014. If oil price forecasts were to drop the valuation would as well, but decreased prices would hurt the company across the board, while if they were to climb to $100/bbl at the time of revaluation, the new price would rise to $12.00/BOE. Petrobras would then be required to shoulder an additional $17bn liability and expose itself to future negative shocks in world oil prices over the 40 year course of

[55] Leite, 7
[56] Leite, 8-10

repayment.[57] Additionally, non-government shareholders were not given a voice in the negotiations. The failures to acquire a lower BOE price, to reduce risk or to seek feedback from private investors in this deal are major drivers of the deteriorating perception of Petrobras' corporate governance structure, despite Deutsche Bank's previously cited lukewarm statement of confidence.

Local Content Requirements & Foreign Corporations

President Lula has expressed a desire to use the new petroleum fields to develop all of Brazil and wants a high minimum LCR in E&P and corollary industries, starting at 55 percent, increasing to 65 percent in 2016, with the potential to reach up to 95 percent, in some cases, by 2017.[58][59] This should bring in billions of dollars needed to develop the nation's infrastructure, but will also drive up costs and slow production with bottlenecks. Law 9,478/07 does not expressly mandate a LCR; this was handled piecemeal by the ANP until Lula took office in 2003 when the agency established guidelines under Ordinance 180. Called the Mobilization Program for the National Oil and Natural Gas Industry (PROMINP), the ordinance has sparked the creation of an estimated 640,000 new jobs in the oil and gas sector from 2003 to 2009 and increased local participation from $35bn to $190bn.[60]

The World Bank's Growth Commission recommends developing countries invest around 25 percent of GDP into the country and about seven percent for infrastructure. Brazil has slowly been increasing investment up to 20 percent, but devotes a paltry 0.1 percent of GDP to

[57] Leite, 10-12
[58] Leite, 13-15
[59] Barroso
[60] Barroso

transportation infrastructure with GDP growth rates above three percent every year since 2004.[61] While developing national infrastructure is vital to all Brazilian industries, petroleum included, the high LCR is an example of the political forces at play, whereby national interests restrict the dynamism of a national industry and a SOE. The LCR will likely make doing business yet more difficult for foreign corporations at a time when foreign capital is vital to expanding operations.

The gradually increasing nature of the LCR will trigger heavier investment early on, creating some jobs operating newly purchased equipment, but it will force companies to buy products abroad now that otherwise would have been produced domestically eventually. This thereby negates the intended potential multiplier effect that would help propel national capacity building. The slow development of human capital is also a concern, since initially there may not be enough skilled personnel to operate the new purchases.[62]

Irrespective of the LCR, oil companies have been flocking to Brazil since the first announcement in 2007. The 2008 Rio Oil and Gas Expo and Conference hosted 34,000 visitors, a 50 percent increase in attendance from 2006. Seventy American corporations were present in total, of which 59 came as part of a delegation coordinated by the US Department of Commerce. Eleven of the 53 Norwegian firms in attendance announced that they would invest a combined $9bn in Brazil over the next three years.[63]

New Refineries: A Worthwhile Investment?

One-third of capital expenditure over the next five years ($74bn) will be spent on refining, half of which will be allocated to the construction of three costly refineries, the other half to

[61] "Success Offshore, Challenges Onshore." Institutional Investor 43.10 (2009) 5-6.
[62] "Condemned to Prosperity," Economist 393.8657 (2009) 12.
[63] Peter Howard Wertheim, Brazil's Pre-Salt Discoveries a Magnet for Oil Companies." Offshore 68.10 (2008) 75.

expanding the capacity of existing facilities. The new refineries Abreu e Lima (online by 2012), Premium I (2014), and Premium II (2017) will be located in Pernambuco, Ceará, and Maranhão states, respectively. These projects will cost more, on average, than other greenfield refineries worldwide (per bpd) by a factor of almost 2.25 (Abreu e Lima is actually more expensive than the recent Jamnagar refinery in India by a factor of 5.74). The factories are located in undeveloped areas with almost no oil production and small markets relative to the south of the country, where the largest markets and pre-salt fields are located. According to Credit Suisse, they will have a negative net present value (NPV) due to the already comparatively high price of petroleum products in Brazil even with lower quality. Petrobras figures suggest that the 23 percent increase in refining capacity by 2014 will fall short of domestic demand in that year and the 53 percent increase to 2.8 MMbbd/l by 2020 will match demand.[64]

Despite Petrobras' rationalization that it must grow refining capacity with domestic consumption and maintain integration, cost projections are extraordinary and financial analysts have criticized these projects. The decisions to locate factories far from both supply and markets and produce premium fuels that are cost-inefficient in Brazil can be interpreted to be more in line with the government's development agenda than Petrobras' corporate interests. Further, a global surplus in refining capacity suggests the new facilities will only harm upstream returns, which are already unprofitable.[65] Critics point to this as an example of the recent politicization of Petrobras' management and have raised concerns about the cooption of the corporate governance apparatus by the President and his political allies.

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[64] Sequiera, 8
[65] Leite, 22-25

Cost of recent greenfield refining projects worldwide						
Refinery	Country	Company	Startup	Capacity(kbpd)	Cost (US$mn)	Capex per bpd (US$)
Jamnagar	India	Reliance	2008	660	6,000	9,091
Maharashtra	India	HPCL	2012*	300	6,400	21,333
Bhatinda	India	HPCL	2011	180	4,730	26,276
Al-Zour	Kuwait	KNPC	On hold	615	15,000	24,390
Sohar	Qatar	ORCL	2007	116	1,300	11,207
Huizhou	China	CNOOC	2009	240	3,000	12,500
Qingdao	China	Sinopec	2008	200	1,875	9,375
Tianjin	China	CNPC/Rosneft	2012	200	3,070	15,350
Dushanzi	China	Petrochina	2009	200	4,400	22,000
Sandino-Bolivar refinery	Nicaragua	PDVSA/Petronic	2012	150	4,000	26,667
Refinaria del Pacifico	Ecuador	Petroecuadro/PDVSA	2013	300	6,600	22,000
Global Average						**18,199**
Abreu e Lima	Brasil	Petrobras	2012	230	12,000	52,174
Premium I	Brasil	Petrobras	2014	600	19,800	33,000
Premium II	Brasil	Petrobras	2017	300	11,100	37,000
Petrobras' Average						**40,725**

Source: Company data, Credit Suisse estimates [66]

Issues of Contention

From Concessions to Production Sharing Contracts

The concession system has been a stable, transparent, and effective regulatory mechanism since the first auctions in 1998. By offering corporations the sole rights to production blocks in competitive auctions, the government was able to capitalize on private, foreign investment, skilled labor, and resources and receive substantial tax and royalty profits. In 2007, a typical concession contract included 60 separate taxes and contributions to federal, state, and municipal government with a combined taxation rate and “government take” of 34 percent, with a net cash flow for the corporation of only 14 percent of gross income.[67] The new system is inherently less transparent, making it more susceptible to corruption—Petro-Sal can award contracts directly to Petrobras without bidding if it is deemed to be “in the public interest.”[68]

[66] Leite, 25
[67] Luiz Rezende, Mario Nascimento, and Mauro Andrade, "The Impact of Tax on Oil and Gas Production in Brazil," International Tax Review (2007) 14-16.
[68] Humberto Quintas, New Challenges: "Pre-Salt" and the Production Sharing Proposal for Brazil, Universidade de São Paulo: IBP - Brazilian Institute of Oil, Gas and Biofuels, (2010).

However, some analysts argue the PSC can be a more flexible mechanism and a better option from the perspective of the state. Since, as of 2008, only three of the top 20 oil producing countries used a pure concession model (USA, Canada, and Brazil), from a global industry perspective, this is hardly a radical move.

Petrobras' Automatic 30 Percent Capital Stake

By automatically awarding a 30 percent capital stake to Petrobras, it restricts the speed of development and exposes the system to infrastructural and resource bottlenecks. This is exacerbated by the high LCE. These moves are seen as nationalistic and will most likely restrict productive potential.[69] From a pure business standpoint, this constraint is inefficient and a clear negative, assuming a realistic view of Petrobras' ability to expand its productive capacity in the coming years. The government may view this as a means by which to extend the life and profitability of the fields, but the gains in NPV by rapid extraction clearly outweigh such a strategy as the company already boasts a strong 3P (proven plus probable plus possible) reserve life of 52 years.[70]

In mandating foreign corporations to enter joint ventures with Petrobras, the government can expect that Petrobras will naturally act as an agent of the state in the process of maximizing its own profits. Further, it could potentially offer regulators a more comprehensive vantage point as Petro-Sal adapts to the new regulatory mechanism.[71]

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[69] Quintas
[70] Leite, 26
[71] Dr. Edmilson Moutinho dos Santos, Carlos Augusto de Almeida Correia, "Should the Brazilian National Petroleum Agency Explore New Contracting Formulas?" PetroLab 11/05/2010.

Taxation and Royalties are More Distributive

Historically, the federal government reaped 40 percent of royalties and taxes, with producing states and municipalities each receiving 22.5 percent, 7.5 percent went to municipalities involved in the delivery and exportation of offshore oil, and the remaining 7.5 percent was spread among all states and municipalities. Rio de Janeiro, Espirito Santo, and São Paulo, by far the most productive states, benefited the most from this arrangement. The state of Rio de Janeiro receives approximately 15 percent ($4.1bn) of its total revenues from oil production.

Under an amendment proposed by Ibsen Pinheiro, a *deputado federal* from Rio Grande do Sul, the federal government would continue to receive 40 percent of royalties and municipalities involved in the delivery and exportation of offshore oil would continue to receive 7.5 percent, but the remaining 52.5 percent would be divided equally among states and municipalities. The result for Rio de Janeiro state would be a 96 percent reduction to only $130 million per annum. Understandably, representatives of the trio of oil producing states were furious. Rio's Finance Secretary, Joaquím Levy, lamented, "What am I going to do, stop paying 220,000 public employees and pensioners? Do I close all the hospitals and sack the police?" [72] The amendment was approved by the *Câmara dos Deputados* by a vote of 369 to 72 in March 2009; however it could be struck down by the Supreme Court under Article XX, Section I of the Federal Constitution that refers to governmental property.[73]

[72] " Raining on Rio's Parade." Economist 395.8677 (2010) 39-41.
[73] Quintas

Petrobras Capitalization & Government Influence

The government is generally perceived to have received a sweetheart deal in the 5bn BOE rights transfer which raises questions about the independent and prudence of Petrobras' management. The company has for decades been a pillar of autonomy and strength in Brazilian politics and a model for other SOEs. Petrobras clearly has much to gain under the new arrangement, but by leveraging 5bn BOE at such a high price, foreign investors are concerned. A firm already spread extremely thin by the 30 percent minimum participation requirement will have to focus a disproportionate amount of resources on these blocks, where it is the sole agent, most likely delaying the development of other viable blocks, missing out on critical foreign investment opportunities.

The federal government (directly and through interlocutor investors), has always had a "golden stake" in Petrobras. The increase in its ownership share does not substantially augment its voting rights, but the method by which it acquired these shares hurts investor perceptions of the company, which, as its primary shareholder, harms its own interests. Whether or not this is outweighed by the profitable terms of the deal is yet to be seen. However, the governments increased ownership of Petrobras further restricts the company's ability to leverage foreign investment in the short-term.

Social Fund

The Social Fund is a noble concept, redistributive at heart in the vein of the Pinheiros amendment. However, the proof will be in the pudding. If Petro-Sal can effectively manage the funds, it could improve national capacity building, delivering much needed funds to infrastructure development with a multiplier effect that could, in the long-run, benefit Petrobras and the oil industry itself. Conversely, such a large fund could easily be corrupted, used instead as a political war chest for the party that controls Petro-Sal and as a slush fund for corrupt politicians. The "oil curse" is a very real possibility for a country already ranked 75th of 180 in TI's Corruption Perception Index, and regulators must make sure to create bountiful safeguards to protect this deep well of money.[74] This raises serious questions as to how, of whom, and by whom Petro-Sal will be constituted.

Conclusion

Brazil's future potential is undeniably bright, but the benefits from the pre-salt are "theirs to lose." Other resource-rich countries have, in their own ways, famously fallen victim to the "Dutch disease" and its associated corruption, mismanagement, and conflict. Unlike the majority of these countries though, Brazil already has a vibrant economy, a developed civil society, and a strong (but flawed) democratic government and regulatory structure. It is unlikely that its experience will be as unfortunate and wasteful as that of Mexico's oil boom in the last century, but it must be heedful and ensure it does not over-regulate production and under-regulate the distribution of profits—this particularly means staffing the new and powerful Petro-Sal with experienced managers, industry experts, scientists, and career regulators and not political appointees who would be more susceptible to political pressure and corruption. This also prioritizes maintaining and improving the ability of Petrobras to pursue independent business strategies in its own best interest, much as it did in the late 1990s under Philippe Reichstul. The radical improvements that occurred after 1997 stand as a testament to the policy that Petrobras not recede further into being co-opted by government officials and their short-term political aspirations.

[74] Economist Intelligence Unit, 1

The move from a proven concession model to a PSC system is intended to maximize public profits and tighten government control of petroleum production. However, it will seriously extend Petrobras and restrict the role of private enterprises at a time when their resources and expertise are most vital, causing delays and reduced profitability. This will decrease perceptions of management and decision-making for both the federal government and Petrobras, hurting their credibility among investors. Nonetheless, the outgoing Lula government has apparently determined this to be an acceptable risk, especially since foreign capital and firms remain eager to get their hands on Brazil's "black gold," despite analysts' misgivings.

While the start-up phase may be slower than expected, an energy-independent Brazil with locally-sourced content in excess of 75 percent will no longer have to rely on neighbors like Venezuela and Bolivia or trans-oceanic supply routes to supply its growing energy demand. Instead, it will be able to levy its resources to pursue its independent interests, flex its muscles internationally, and increasingly act as *the* arbiter of regional affairs.

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