

Petróleos de Venezuela, S.A.: The Right-Hand Man of the Government

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Working Paper #70

November 2007

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About the National Oil Company Study

While the role of the state is declining in nearly every sector of world economic activity, in hydrocarbons the pattern is quite different. State-controlled oil companies—so-called national oil companies (NOCs)—remain firmly in control over the vast majority of the world's hydrocarbon resources. Some NOCs are singular in their control over their home market; others engage in various joint ventures or are exposed to competition. PESD's study on National Oil Companies focuses on fifteen NOCs: Saudi Aramco, NIOC (National Iranian Oil Co), KPC (Kuwait Petroleum Co), PDVSA (Petróleos de Venezuela), ADNOC (Abu Dhabi National Oil Company), NNPC (Nigerian National Petroleum Co), PEMEX, Gazprom, Sonatrach, CNPC, Petrobrás, Petronas, ONGC, Sonangol, and Statoil.

These enterprises differ markedly in the ways they are governed and the tightness of their relationship with government. NOCs also vary in their geological gifts, as some are endowed with prodigious quantities of "easy" oil while others must work harder and apply highly advanced technologies; some have sought gas, which requires different skills and market orientation than oil, while others stay focused on liquids. These case studies explore whether and how these and other factors actually explain the wide variation in the performance of NOCs.

About the Author

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INTRODUCTION

Petróleos de Venezuela, S.A. (PDVSA), the national oil company (NOC) of Venezuela, is a major energy producer. Vertically integrated, the company conducts large-scale domestic exploration and production activities in both oil and natural gas, operates domestic and international refining facilities, and sells gasoline products to consumers both at home and abroad. The Petroleum Intelligence Weekly reports that PDVSA is the world's fourth largest energy company and third largest NOC (Petroleum Intelligence Weekly 2006).

But PDVSA is much more than a business—it serves, perhaps primarily, as the funding and implementing agent of Venezuelan President Hugo Chávez. The company provides the Venezuelan government with at least 48% of its total revenues (PDVSA 2007b)¹ and takes various actions in support of government objectives. Even PDVSA's long-term business strategy—in exploration, refining, and other activities—is linked to the government vision.

The Venezuelan government has relied on PDVSA to fund and implement a heavily interventionist strategy with several aims. The influx of large hydrocarbon revenues has funded Venezuelan government projects to improve social conditions,

¹ This figure does not include extrabudgetary revenues used for Venezuela's various social programs.

particularly for the poor. These revenues have also enabled the government to cement patronage networks and nationalize those economic sectors that might otherwise threaten its rule.

The effectiveness of this strategy is uncertain, however, and it is highly dependent on current oil prices. Near-maximization of current hydrocarbon revenues has come at the expense of oil sector investment. Government price controls have concealed underlying imbalances within the Venezuelan economy. Sustained increases in social spending have brought about only modest social benefits.² If the oil price wave crashes, much of the Venezuelan government's strategy could come unraveled.

In this paper, I offer a broad sketch of PDVSA, focusing mostly on the present day. While far from comprehensive, this study provides a descriptive account of how the company operates under the considerable mandates of the Venezuelan state. Part I presents a brief history of PDVSA, chronicling its development from nationalization, when the government designed the company to create greater state control over oil resources, to after the company's 2002-03 strike, when the limits of that design became apparent. PDVSA historically focused on commercial aims, seeking to minimize interference from—and contributions to—the state. Part II gives a snapshot of PDVSA as a company today, describing its production, refining, and other operations. Following these preliminaries, the study concentrates on PDVSA's framework today, suggesting three models: PDVSA as a government revenue-provider, implementer of political objectives, and viable business. Part III outlines PDVSA's role as an important revenue-collecting actor for the Venezuelan government. The Venezuelan government collects money from PDVSA through both recurring taxes and discretionary social obligations to

² See n.29 for more information.

fund a large proportion of its rising spending. Because of this arrangement, the government has become economically dependent on PDVSA, but its growing appetite for PDVSA revenues risks undermining the company's long-term viability. Part IV discusses how PDVSA has become an implementing agent for the state, delivering revenues to government-selected beneficiaries and making business decisions in support of government objectives. Because the government takes some diplomatic and policy actions in support of PDVSA, government objectives have become deeply intertwined with PDVSA's own goals. Part V considers PDVSA as a business, exploring how its plan interacts with government revenue-collection and implementation demands. These three stylized descriptions of PDVSA—as a government revenue-provider, implementer of political objectives, and viable business—significantly overlap. Nevertheless, they offer a framework for understanding PDVSA today. I conclude by linking my description of PDVSA to the research framework for our multi-country NOC study and offering a few final observations. An appendix on Venezuela's hydrocarbon resources follows the paper.

I. HISTORICAL BACKGROUND ON PDVSA

The PDVSA of today is significantly different from the company before Chávez. In the years between its inception in 1975 and 2000, PDVSA developed into a large, internationalized company with strong technical expertise but limited connections to the state. Mutual antagonism between PDVSA and Chávez grew following his first election in 1998, culminating in a massive 2002-03 PDVSA strike against the government. In the aftermath of the strike, Chávez fired 18,000 PDVSA employees, including many of its top engineers. PDVSA emerged from these firings as a company that in many ways was

transformed. Although PDVSA's operational structure remained mostly intact, institutional knowledge suffered, managers became closely aligned with the state, and government obligations on the company soared.

The following section of the paper details PDVSA's history, narrating its development from a superficially nationalized, commercially focused company in 1975 to one that is highly integrated with government objectives today.³

PDVSA's Early History: A "Private" Company Within the Larger State

The Venezuelan government established PDVSA to consolidate state control over hydrocarbons resources, but PDVSA managers soon became the driving forces of the country's oil policy. Nationalization began in 1975, when then-president Carlos Andrés Pérez signed legislation into law establishing PDVSA from assets expropriated from private oil companies.⁴ PDVSA continued operating much like the private oil companies that preceded it, however. The new company's three operating units, Maraven, Lagoven and Corpoven, were similar to their pre-nationalization counterpart affiliates of Shell, Mobil, and Exxon, respectively, and they competed with one another like business adversaries (Mares & Altamirano 2007, 40). PDVSA managers also sought to maintain the oil sector's pre-nationalization independence from the Venezuelan government (Tinker-Salas 2005); PDVSA, rather than the oil ministry, took the lead role in contracting with oil companies (Ellner & Hellinger 2003, 137). Pro-Chávez observers have suggested that nationalization initially decreased state control of oil policy because

³ Please refer to other works focusing on PDVSA's historical development (e.g., Coronel 1983, Kozloff 2006, and Mares & Altamirano 2007) for a more detailed treatment.

⁴ These private oil companies received \$475 million in compensation for the expropriation (Falola & Genova 2005, 54).

it gave PDVSA executives—who were largely the same as those before nationalization—easier access to, and influence over, oil ministry regulators (Mommer 2002). At minimum, nationalization preserved the Venezuelan oil industry’s pre-nationalization commercial focus.

Beginning in the 1980s, PDVSA embarked on a highly effective downstream internationalization strategy⁵ to secure markets for the company’s specialized, extra-heavy crude production. Initially, this strategy focused on building joint ventures with refineries in major markets (Mares & Altamirano 2007, 30); PDVSA would eventually hold ownership stakes in refineries in Germany, the United Kingdom, Sweden, and the United States (PDVSA 2007b, 20). The company later began targeting downstream consumers, both at home and abroad. In 1986, PDVSA purchased CITGO, providing a distribution channel for gasoline products in the United States; by 1999, the company had 13,000 CITGO gas stations and controlled more than 10% of the U.S. market ([Economides, Martínez, & Puky 2007](#)).

Besides securing overseas markets, PDVSA’s internationalization strategy furthered the company’s autonomy by increasing the share of assets outside of direct national control.⁶ PDVSA’s foreign subsidiaries, notably CITGO, did not pay dividends to headquarters for some eighteen years (Mommer 2002).⁷ According to current

⁵ Note that the PDVSA never internationalized its upstream exploration and production activities, however. In addition to its internationalization strategy, PDVSA emphasized research, creating the top-flight research center of Intevep ([Economides, Martínez, & Puky 2007](#)). By 1986, PDVSA had developed Orimulsion, a new type of fuel using upgraded Orinoco heavy oil ([Economides, Martínez, & Puky 2007](#)).

⁶ Former PDVSA Director Gustavo Coronel has admitted that one of the company’s objectives was to maintain its independence from political interference (Coronel 1983).

⁷ Mommer suggests that PDVSA established international refineries for much the same reason. He points out that the company’s first foreign refinery—in Germany—has never refined extra-heavy crude; it refines instead PDVSA’s smaller supplies of light oil, which are more easily marketable (Mommer 2002).

Venezuelan energy minister Rafael Ramírez, the internationalization strategy led to the transfer of \$14 billion outside the country (Ramírez 2006).

The 1990s *Apertura*

By the 1990s, PDVSA began focusing on the upstream side of its operations by deepening links with international oil companies (IOCs). This strategy, known as the “*apertura*” (opening), centered on three elements: 1) Increasing production from existing fields; 2) Developing marginal fields; and 3) Expanding investment in non-conventional oil. Each of these elements would later become sources of controversy during the Chávez administration.

The first element of the strategy, aimed at existing fields, involved joint venture projects with IOCs. PDVSA offered these joint ventures through eight blocks of risk/profit sharing agreements (RPSAs) (EIA 2006b). For each RPSA, PDVSA had the option to purchase up to a 35% stake, if the IOC discovered commercial quantities of oil in the exploration phase (EIA 2006b).

For the second element of the strategy, IOCs entered into operating contracts with PDVSA to develop marginal fields at low tax and royalty rates.⁸ PDVSA established 32 operating contracts with 22 separate IOCs, including Chevron, BP, Total, and Repsol (EIA 2006b). Under these contracts, IOCs operated oil fields; PDVSA paid the companies a fee and purchased the produced crude at a price pegged to market rates (EIA 2006b). The contracts classified IOCs as “service contractors” subject to a 34% tax rate; oil producers in other contexts paid 66.6% (Mather 2006). The Chávez government

⁸ These wells are not, by U.S. standards, “marginal” because production sometimes doubles 15,000 barrels per day, the upper limit for marginal fields in the United States (Ellner 1998).

would later argue that these operating contracts deprived the government of significant revenues (Mather 2006), even though the contracts were arguably necessary to spur investment in those fields.

For the third element of the strategy, PDVSA participated in four strategic associations with IOCs to develop extra-heavy non-conventional oil in the Orinoco region. Designed to produce a synthetic crude oil known as “syncrude,” these strategic associations were subject to a 34% income tax and 1% royalty rate (Ellner & Hellinger 2003, 136). Today, the strategic associations have become a major source of upgraded oil that competes commercially with conventional oil (see “PDVSA as an Implementer of Political Objectives,” below).

The *apertura* strategy ultimately led to significantly increased production at the expense of OPEC quotas. By 1998, PDVSA exceeded its production quota by 800,000 barrels per day (Kozloff 2006, 11) but improved its bottom line. Many PDVSA officials opposed OPEC membership anyway; early 1990s PDVSA president Andrés Sosa Peitri had advocated Venezuela’s withdrawal from the organization (Ellner & Hellinger 2003, 136).

PDVSA management believed that outsourcing upstream operations to IOCs would benefit the state.⁹ Management premised this belief on the theory that the oil sector would help Venezuela not by creating government revenues but by generating growth for the rest of the economy. Government dependence on the oil sector, according to this view, harms the country because government revenue collection fuels corruption and restricts

⁹ PDVSA management’s views on the appropriate state-NOC relationship long predated the *apertura*. In 1983’s *The Nationalization of the Venezuelan Oil Industry: From Technocratic Success to Political Failure*, former PDVSA Director Gustavo Coronel suggested that the company could not function effectively unless it were independent (Coronel 1983).

PDVSA's capacity to invest in the sector. Through unofficial channels, PDVSA vigorously criticized government dependence on PDVSA; company management probably, but anonymously, paid for a 1999 advertisement in *Time* (Latin America) suggesting that the company's privatization was inevitable (Tinker-Salas 2005).¹⁰

Venezuelans outside PDVSA, however, largely opposed the philosophy motivating the *apertura*. Building on longstanding suspicions that PDVSA had become a "state within a state" (Tinker-Salas 2005), many within the Venezuelan left had, by the late 1990s, argued that PDVSA had placed the interests of IOCs in low taxes above the interests of the tax-collecting state (Mommer 2002). Chávez campaigned for president in 1998 in part by denouncing PDVSA as insensitive to the needs of the poor, who were dependent on government spending (Mares & Altamirano 2007, 46). Upon winning the election and entering office in 1999, Chávez began implementing policies that would ultimately reshape the company.

Transition to Firmer State Control

Despite his campaign platform, Chávez initially pursued only modest changes in PDVSA's business practices. In 1999, his administration passed an investment-friendly Gas Hydrocarbons Law (EIA 2006b). Even by January 2000, some observers believed that Chávez would maintain the economic policies previously in place (Mares & Altamirano 2007, 32-33).

Yet as time progressed, the Chávez administration began rolling back PDVSA's *apertura* strategy, rankling company management. Instead of acquiescing to PDVSA management plans for increased oil production, the Venezuelan government mandated

¹⁰ Ellner suggests that the advertisement's sponsors wanted to float a trial balloon (Ellner 1998).

that the company adhere to its OPEC quota (EIA 2006b), ostensibly to raise oil prices. The government also passed the 2001 Hydrocarbons Law, stipulating that all future foreign investment take the form of new joint ventures with majority PDVSA ownership. The law raised royalty rates for the new joint ventures from 1-17% to 20-30% (EIA 2006b), though it decreased some tax rates (Mommer 2002). The government pressured IOCs operating under the old *apertura* arrangements to migrate to the 2001 Hydrocarbons Law (Freshfields 2005). Although these measures gave PDVSA greater control over the oil industry, many within the company opposed them. They believed that government interference would reduce investment in the oil sector and harm the company's long-term profitability.

To change PDVSA's internal culture, the Venezuelan government began mandating changes within the company. After PDVSA management criticized Chávez's oil policy, he appointed a new board of directors to the company in February 2002, perhaps illegally (Frederick 2005, 152). PDVSA executives alleged that the government appointed political allies on the basis of government loyalty rather than merit (BBC 2002b).

The Chávez administration's actions antagonized PDVSA employees, leading to a series of 2002-2003 protests and strikes against the government. PDVSA launched these strikes in an effort to starve the unpopular government of resources and thereby topple it from power (Mares & Altamirano 2007, 36). PDVSA's first protests in April 2002, joined by teachers, doctors, and the Roman Catholic Church (BBC 2002a), attracted 500,000 supporters (Frederick 2005, 152). After clashes between the government and protesters killed more than fifteen people, the Venezuelan military rebelled against

Chávez and briefly took control of the government (Frederick 2005, 152). Pro-Chávez supporters then rioted against Chávez's ouster, demanding his reinstatement. In response to the riots, the military returned Chávez to the presidency, and his popularity soon grew higher than it was before the strike (Mares & Altamirano 2007, 36). PDVSA and other workers subsequently launched a second strike in December 2002 in response to the Venezuelan Supreme Court's ruling against a referendum on Chavez's rule. This second strike also failed, and some citizens began to blame PDVSA and the opposition for damaging Venezuela's economy. In the second strike's immediate aftermath, national oil production fell from 3.3 million barrels per day in November 2002 to an estimated 700,000 barrels per day in January 2003 (EIA 2006b).

Having outlasted the strikes, the Venezuelan government set about reshaping some, but not all of, the company. Chávez fired 18,000 of PDVSA's workers who participated in the strike, including many of its engineers (Harman 2006). Accounting for subsequent re-hirings, the company lost a net 30-40% of its workforce (derived from Mares & Altamirano 2007, 6). Though these actions sapped PDVSA of much of its managerial and technical talent, Chávez helped ensure that the new PDVSA would owe loyalty to him. In some respects, Chávez maintained PDVSA's status quo: he did not, for example, sell off PDVSA's overseas refineries, CITGO, and many other legacies from the internationalization era. But PDVSA's has radically shifted its orientation towards meeting government objectives.

II. PDVSA'S CURRENT ORGANIZATIONAL STRUCTURE: A SNAPSHOT

The following section offers a general overview of PDVSA as a company at the present day. This overview sketches selected business functions within PDVSA, so as to

provide a general sense of the company's breadth. For an analytical look at the current company, see parts III, IV, and V.

Oil Production

Today, PDVSA is one of the most important oil producers in the world, but the precise figures are uncertain due to the lingering effect of post-strike declines and some methodological questions over production figures. For 2005, BP estimates that Venezuela produced 3.007 million barrels per day (BP 2006) whereas the Energy Information Administration reports a significantly lower figure of 2.8-2.9 million barrels per day (EIA 2006b, 5); PDVSA's official production statistics put the total implausibly high at nearly 3.250 million b/d (PDVSA 2007h, 6). PDVSA itself produces around 60% of total Venezuelan production, or probably around 1.6 million barrels per day (EIA 2006b, 5); PDVSA again overestimates the figure at 2.330 million barrels per day (PDVSA 2007h, 6). Differing production figures significantly affect Venezuela's standing relative to other countries; depending on the estimate, Venezuela is one of the top ten-to-fifteen producers in the world (derived from BP 2006).

The widely divergent estimates reflect a mix of political and methodological concerns. Politically, the Venezuelan government has sought to demonstrate PDVSA's success in recovering from the 2002-03 strike, even if those political objectives lead to factual exaggerations; a March 2006 PDVSA press release, apparently no longer available on the PDVSA website, is entitled "Secondary Sources Recognize Total Recuperation of the Venezuela Petroleum Industry" (Fox & Wilpert 2006). PDVSA is, in fact, probably producing 30% less oil than before the strike, although some IOCs

participating in joint ventures with the company have increased their production in their interim (EIA 2006b). Key adverse affects from the strike include diminished technical expertise within PDVSA and, potentially, reservoir damage from improper reactivation of fields (EIA 2006b).¹¹ Several classification issues further bedevil the accuracy of production estimates. One issue is whether to fully include Venezuela's increasing production of non-conventional oil, which is produced and upgraded from Orinoco extra-heavy oil (Fox & Wilpert 2006). Some analysts fully include this production, whereas others, such as the USEIA, count only the upgraded syncrude, which is roughly 10 percent less than the volume of the original extra-heavy oil (EIA 2006b). Also unclear is whether Venezuela includes estimates of non-conventional oils in its official production estimates (EIA 2006b).

Relying on BP statistics—which are intermediate between the EIA and Venezuelan government—Venezuela has returned to its production levels of a decade ago but remains below its late-1990s peak (BP 2006). See Table 1 for more information.

¹¹ Note that limited production capacity may have partially motivated Venezuela's efforts to reduce OPEC quotas (a point further discussed in the section on "PDVSA as a State Implementing Company," discussed below).

Table 1. Oil Production in Venezuela, 1995-2005 (million barrels per day)											
Year											
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Production	2.95	3.13	3.32	3.48	3.12	3.23	3.14	2.91	2.60	2.97	3.00
n	9	7	1	0	6	9	1	6	7	2	7

Source: BP 2006.

Exploration and Certification

PDVSA relies heavily on its partnerships with NOCs from Chávez-friendly governments to conduct exploration and certification activities. According to recent financial information, PDVSA spent \$100 million on exploration (PDVSA 2007b, 5) and completed five wells (with eight more in progress) during 2005 (PDVSA2007b, 15). PDVSA also launched a “Magna Reserve” project designed to certify PDVSA’s substantial oil reserves in the Orinoco region of Venezuela, as detailed below (see “PDVSA as an Implementer of Political Objectives”). The project operates through partnerships between PDVSA and foreign companies—mostly NOCs—from Chávez-friendly governments. Most of the NOCs involved—with the exception of Lukoil—have little experience with extra-heavy oil, the type found in the Orinoco (Otis 2007a).

Refining

PDVSA refines over 2.8 million barrels per day, and the bulk of its refining activities occur overseas—a legacy of the 1980s internalization strategy. The single largest collection of refineries is in the United States, where eight plants—mostly owned

by PDVSA subsidiary CITGO—produced 1.310 million barrels per day in 2005 (PDVSA 2007c, 20). PDVSA sold its 41% stake in the Lyondell refinery in 2006 (PDVSA 2007c, 20), however, so future U.S. refining activities will decrease. PDVSA also has minor refining activities in Europe, producing 259 million barrels per day in 2005 (PDVSA 2007c, 20). The company has announced plans to begin refining activities in Cuba, Jamaica, and Brazil (PDVSA 2007c, 20).

PDVSA also owns several domestic refineries, refining a combined 1.303 million barrels per day in 2005 (PDVSA 2007c, 20). Among these refineries is the company's single largest facility at Paraguaná, which refined 940 million barrels per day in 2005 (PDVSA 2007c, 20).

Distribution

PDVSA has a substantial international and domestic distribution network. Through CITGO, PDVSA maintains a reliable market for selling much of its production overseas. CITGO sells fuel, asphalt, wax, and various petrochemicals and oil (CITGO 2007a). PDVSA is the most important supplier of oil to CITGO, and CITGO's refineries maintain long-term contracts for PDVSA crude (PDVSA 2007b, 25). PDVSA also has an extensive domestic distribution network, although it sells most products domestically at an enormous loss (see "PDVSA as an Implementer of Political Objectives," below).

Employment

Unlike NOCs elsewhere, the Chávez government had not directly relied on PDVSA to achieve public employment goals, although this strategy is changing. PDVSA

has 75,000 employees and contracted workers (Pretel 2007), which is a relatively small figure for a company its size. According to Myers Jaffe, PDVSA maintained one of the lowest ratios of employees to million barrels of oil produced for any oil company—whether an IOC or NOC—as of 2004 (Myers Jaffe 2007). A major reason for this low ratio is that PDVSA employment figures had not yet recovered to pre-strike levels as of 2004. These figures are likely to change: Chávez announced in October 2007 that he plans to expand PDVSA's payroll from 75,000 to more than 101,500 employees by 2008 and to 122,000 by 2010 (Pretel 2007). Also, the Venezuelan government relies indirectly on PDVSA to achieve its public employment goals by urging—and in some cases mandating—that the company contract out work, where possible, to social cooperatives (PDVSA 2007f 797, 847-48).

Natural Gas

PDVSA exerts far less control over natural gas than it does over the oil sector. Although PDVSA Gas controls gas transmission and a significant percentage of gas distribution assets (Ferrell 2005 3), the 1999 Gas Hydrocarbons Law allows private operators to own 100 percent of non-associated projects (EIA 2006b). These operators therefore enjoy greater control than private oil operators have enjoyed under the Chávez administration or even prior governments. Also, the 20 percent royalty and 30 percent income tax rates are much lower than corresponding rates for oil projects (Ferrell 2005?, 2).

One of PDVSA's primary responsibilities in the natural gas sector is to license projects to the private sector. In June 2001, PDVSA held its first non-associated natural

gas licensing round for eleven exploration blocks; it awarded six of those blocks (EIA 2006b). PDVSA also awarded offshore exploration blocks in the Plataforma Deltana area, near the country's northeast coast with Trinidad and Tobago (EIA 2006b). Recent natural gas licensing rounds took place in 2005, covering offshore acreage in the Gulf of Venezuela adjacent to Falcon state, and in August 2006, near La Blanquilla Island and La Pescadora (EIA 2006b). Several IOCs—such as Chevron, Total, and Repsol—and NOCs—like Gazprom, Statoil, and Petrobras—have participated in the licensing (EIA 2006b). Repsol-YPF is the largest private natural gas producer in Venezuela (EIA 2006b).

Pragmatic and political factors have motivated the Chávez administration to carve out an exception to its strongly pro-nationalization policies for the natural gas sector. The non-associated natural gas sector is relatively undeveloped; the Venezuelan government has thus sought out IOCs and other NOCs because only they have the necessary capital and risk tolerance to make expensive initial investments.¹² Because of the sector's underdevelopment, the Venezuelan government has not made natural gas a political flashpoint within Venezuela. The government has instead taken advantage of the political conditions within the natural gas sector to pursue private investment there.

Summary

The Chávez government has largely maintained PDVSA's downstream structure but has radically altered its upstream operations and, most importantly, relationship with

¹² The oil sector, by contrast, is relatively mature in Venezuela, except in the Orinoco region. Taking over existing oil operations is much less expensive than developing new natural gas operations. The Chávez administration therefore may have decided to strike new bargains with natural gas producers to stimulate interest to stimulate new investment; bargains previously struck with oil producers, by contrast, have obsolesced. Natural gas producers—aware of, and sometimes the same entities as, their oil producing counterparts—have presumably priced in the cost of future obsolescence into their initial contracts.

government. PDVSA's downstream refining and distribution network have not changed substantially during the Chávez administration: The company still refines most of its oil overseas and sells much of that oil through CITGO. PDVSA's partnerships with IOCs, on the other hand, are radically different from ten years ago. PDVSA increasingly relies on NOCs for exploration and, especially, certification activities. Perhaps most importantly, current PDVSA management has prioritized short-term government objectives much more heavily than before. The following three parts of the paper focus on the ways in which this new PDVSA seeks to carry out these objectives: Government revenue provider, implementer of government-mandated actions, and business.

III. PDVSA AS A STATE REVENUE-PRODUCING COMPANY

One of PDVSA's primary objectives is to provide large and easily adjustable revenues to the Venezuelan government. For 2005 and 2006, PDVSA paid the government 71.1% and 74.6%, respectively, of the revenues it obtained from Venezuelan operations (derived from PDVSA 2007h);¹³ these figures do not even account for profits lost because of state-mandated actions. Including those actions (e.g., subsidized domestic gas sales, foreign oil aid programs), which roughly totaled to \$11 billion in 2006 (see "PDVSA as an Implementer of Political Objectives," below), PDVSA gave the government and state-mandated beneficiaries approximately 79% of PDVSA's potential

¹³ Note that PDVSA's gross global revenues are significantly larger than gross national revenues. For 2006, the company's global revenues stood at \$101.990 billion whereas national revenues were \$55.401 billion (derived from PDVSA 2007a, 841). CITGO, PDVSA's U.S. subsidiary, earns most of the non-Venezuelan revenues by reselling oil purchased on the open market. However, the company receives a much lower rate of return on this resold oil than on oil produced domestically. Because PDVSA receives most of its rents from domestically produced oil, this paper compares government obligations to national, rather than global, revenue.

2006 gross national revenues.¹⁴ From the state's perspective, PDVSA is a deeply important source of revenues, providing 48% of the government's total budget in 2005 (PDVSA 2007c, 2) and 45% of the government's total in 2006 (Pearson 2007).

PDVSA provides the government with two types of revenue streams to meet the government's needs: budgetary and extrabudgetary revenues. The budgetary revenues satisfy a significant proportion of the government's institutional responsibilities to ministries, subnational units, et cetera. Extrabudgetary revenues, by contrast, are the primary revenue source for Venezuela's parallel informal institutions, such as its *misiones*, and various foreign aid programs. Although budgetary exceed extrabudgetary revenues, both have grown significantly in size during the past two years. See Table 2 for more information.

Table 2. PDVSA Revenues to the Government: Total budgetary revenues; total extrabudgetary revenues; government budgetary and extrabudgetary revenues relative to PDVSA's national revenues		
	2005	2006
Total <i>budgetary</i> dividends, royalties, and taxes (US\$ billions)	25.580	27.460
Total <i>extrabudgetary</i> social taxes (US\$ billions)	6.909	13.784
Total budgetary and extrabudgetary PDVSA taxes (US\$ billions)	32.489	41.244
Percentage of PDVSA's gross domestic revenues going to government	71.1*	74.6

Source: Derived from PDVSA 2007h. *Because the PDVSA 2007h does not publish national sector revenues for 2005, I rely on national sector figures from 2007b instead.

This combination of large revenue generation and rapidly changing rates is likely to adversely impact PDVSA's capacity to fund the state budget for the long-term. The government has readily adjusted both its budgetary and extrabudgetary collection rates, but has greater capacity to do so on the extrabudgetary side, particularly for the Fund for National Development (FONDEN). The 2005-06 increases in revenue collection,

¹⁴ To arrive at this figure, I added \$11 billion (derived from "PDVSA as an Implementer of Political Objectives," below) to both PDVSA's gross national income and government obligations for 2006.

particularly from extrabudgetary social obligations, have cut into needed resources for investment. Also, the rapid changes in revenue collection probably deter investment, because PDVSA cannot accurately forecast availability of funds. Reduced investment, in turn, will probably diminish PDVSA's long-term revenue generation.

This section of the paper summarizes PDVSA's role as a state revenue-collecting agent across three dimensions: type of revenue collection mechanisms, uncertainty of revenue collection, and production policies. Based on this summary, I find that the Venezuelan government has potentially put PDVSA's financial health at risk because of its increasing economic dependence on company revenues to fund government programs.

Revenue Collection Mechanisms

PDVSA's revenue obligations—both budgetary and non-budgetary—give the Venezuelan government large, but not maximum, short term revenues. These mechanisms do not deliver revenues as effectively as a uniformly-administered resource rent tax, because they tax multiple stages of the production process rather than profits only. On the other hand, they provide dedicated financing streams to specific government entities, and the government may prefer the reliability of this arrangement. Moreover, the Venezuelan government may prefer some mechanisms, like royalties, because it lacks perfect information about company cost structures (Mommer 2002) and is therefore unable to effectively implement a resource rent tax.¹⁵

Because of these preferences, the Venezuelan government has developed a system that provides large, if not maximum, revenues to the government through budgetary and

¹⁵ Note that this argument is most persuasive where the company is relatively independent of the regulators. Because the government took effective control of PDVSA management after the 2002-03 strike, the argument carries less weight here.

extrabudgetary mechanisms. Budgetary mechanisms include dividends, royalties, and taxes. Extrabudgetary mechanisms consist of various social obligations. Both types of mechanisms are discussed below.

Budgetary Resources: Dividends, Royalties, and Taxes

PDVSA provides the largest share of revenues to the Venezuelan government through a range of dividends, royalties, and taxes. Like many other countries, the government assesses royalty rates against total production but imposes the tax only after deducting various costs, including the cost of extrabudgetary social obligations (a point further discussed below). Royalties are the single largest source of budgetary revenues, in part because the senior-level officials in the Chávez administration believed royalties were easier to administer (Mommer 2002). The government established PDVSA royalty fees at 30% in 2002 but subsequently added a 3 1/3% extraction tax in 2006, raising the effective royalty rate to 33 1/3% (Campbell 2006).¹⁶ The second largest source of budgetary revenues is income taxes, set at a post-cost rate of 50% (Mares & Altamirano 2007, 13) (note that the government accounts for extrabudgetary social obligations as costs).¹⁷ The government also receives dividends from PDVSA, as the sole shareholder of the company, once the government has imposed all royalties, taxes, and other social obligations. A breakdown of these budgetary obligations is provided below in Table 3.

¹⁶ Before 2001, the PDVSA royalty rates were higher and the income rates lower; the royalty rate was 16.6 percent and the tax rate was 67 percent (Mares & Altamirano 2007, 13).

¹⁷ Note that the Venezuelan government's taxation structure has partially facilitated the growth of extrabudgetary social obligations. PDVSA's 2006 preliminary financial report indicates that the government treats social obligations as a pre-tax cost rather than as a post-tax investment (PDVSA 2007b, 5). Thus, social obligations are larger than they would be, all else equal, if the government had instead imposed those obligations as post-tax deductions.

Table 3. PDVSA Budgetary Obligations in 2005-0006: Royalties, Taxes, and Dividends (US\$ billions)		
	2005	2006
Royalties	13.318	18.435
Taxes	5.793	4.031
Dividends	6.469	4.994
Total	25.580	27.460

Source: PDVSA 2007h.

Extrabudgetary Social Obligations

A growing share of PDVSA government contributions takes the form of extrabudgetary social obligations. According to PDVSA's 2006 preliminary financial information, extrabudgetary social revenues dramatically increased from \$249 million in 2003 to \$13.784 billion in 2006 (PDVSA 2007c, 5; PDVSA 2007h).¹⁸ Extrabudgetary social revenues have grown in size relative to PDVSA's pre-tax profits, rising from 5.4% in 2003 to 113.7% in 2006 (derived from PDVSA 2007c, 5; PDVSA 2007h). See Table 4 for more information.

Table 4. PDVSA Extrabudgetary Social Revenues: Total, relative to pre-tax profits, and relative to royalties and taxes (US\$ Billions)						
	2001	2002	2003	2004	2005*	2006*
Total extrabudgetary social revenues (US\$ billions)	0	0	0.249	1.242	6.909	13.784
Ratio of social revenues to pre-tax profits	0	0	5.4	11.5	57.0	113.7
Ratio of social revenues to royalties and taxes	0	0	3.2	8.5	27.0	50.2

¹⁸Because of the government taxation structure, extra-budgetary social obligations are a relatively larger, and budgetary tax revenues a relatively smaller, proportion of total government spending. In absolute terms, however, both extrabudgetary social obligations and budgetary tax revenues from PDVSA have grown over the past five years, because the company's gross profits (the source of both social obligations and tax revenues) have also increased. See Table 4 for more information.

Source: PDVSA 2007c, 5 and PDVSA 2007h. Social revenues do not include spending from royalty or tax sources. *For 2005 and 2006, I rely on updated figures from PDVSA 2007h.

Extrabudgetary social obligations center on three areas: the Fund for National Development (FONDEN); the *misiones*; and other social supports, such as the *fideicomisos*.¹⁹ The largest source of social obligations is the highly discretionary, U.S. dollar-denominated FONDEN, which represented 57.9% of all social obligations in 2006 (derived from PDVSA 2007b, 856). The second largest area of social obligations is the targeted social spending programs, known as the *misiones*, comprising 33.1% of all PDVSA's social obligations in 2006 (derived from PDVSA 2007b, 856). Lastly, 9.0% of PDVSA's extrabudgetary social obligations paid for government work programs, known as *fideicomisos* (derived from PDVSA 2007b, 856). See Table 5 for more information.

Uncertainty

The unpredictability of rent collection—particularly through extrabudgetary mechanisms—adversely affects PDVSA's ability to plan. Even budgetary rent collection is somewhat unpredictable; although royalty and tax rates are enshrined into law, the government has changed these rates, because of its nearly perfect control over the legislative agenda.²⁰ The government's discretion over extrabudgetary revenue is even broader because the law does not establish funding rates for those programs. Looking at

¹⁹ For these figures, I rely on PDVSA 2007b figures rather than PDVSA 2007h because PDVSA 2007b, while less current, break down social spending in specific subcategories.

²⁰ Note that spending is also flexible because the government sets PDVSA's budget—and therefore, indirectly, the amount of preliminary dividends, royalties, and taxes—based on an oil reference price (which it also sets) significantly below the market price (Upstream 2007).²⁰ For 2006, this reference price was around \$29/barrel (Upstream 2007). The official budget receives only those royalties, taxes, and dividends tied to the reference price (Upstream 2007). All further receipts of royalties, taxes, and dividends above the reference price become “extraordinary income” for use in discretionary projects (Upstream 2007). Because the market price exceeds \$50 per barrel, the government has substantial discretion over the allocation of half the total budgetary receipts.²⁰

social spending overall, the government imposed only \$249 million in social obligations in 2003 but raised that amount to \$11.8-\$13.8 billion by 2006 (PDVSA 2007a; PDVSA 2007h). Or consider the *misiones* specifically: In 2006, for example, the government established a new science education program, *Misión Ciencia*, and allocated \$230 million in funding to it; whereas the government stopped funding its illiteracy programs, *Misiones Robinson I y II*, in 2004 because it declared that the country was free of illiteracy (PDVSA 2007b, 856).

The government arguably confronts some limits to its discretion, but those limits are largely political, rather than institutional. Because the government directs the *misiones* at a specific group of beneficiaries, the lobbying power of these beneficiaries could constrain the government's capacity to shift funding, but these constraints are only moderate.²¹ The government has similarly broad discretion to adjust funding for its *fideicomisos*; program beneficiaries also place moderate constraints on the government's capacity. Lastly, the government has broadest discretion over the single largest source of social obligations: FONDEN. As with the *misiones* and *fideicomisos*, the law does not specify for specific funding allocations to FONDEN. Moreover, the government does not direct FONDEN to a specific set of beneficiaries, and for that reason it enjoys even greater flexibility in setting the rate for that funding. Note, however, the government may face some constraints even for FONDEN because some FONDEN spending may be allocated for recurring (and non-social) expenses (e.g., defense, finances; see Ministerio del Poder Popular para las Finanzas 2007, 13).

²¹ The lobbying power of these beneficiaries is questionable, because they are widely dispersed, generally poor, and support the current government.

Production Policies

PDVSA's diminished technical capacity and its subsequent takeover of many IOC facilities has reduced Venezuela's capacity to efficiently produce hydrocarbon resources. The post-strike firings significantly diminished PDVSA's once-excellent technical capacity, and the effects linger through today. According to the U.S. EIA, PDVSA's production probably has decreased by 30% since the strike (though Venezuela's total production shortfall is less because IOCs operating in the Orinoco increased their share of production) (EIA 2006b).²² The Venezuelan government further reduced the efficiency of its oil production by giving PDVSA majority ownership of formerly privately-controlled production facilities, including those in the Orinoco region. Venezuela transferred majority ownership of 32 mature fields from private operators to PDVSA in 2006 (Weitzman 2007) and took over four major Orinoco projects on May 1, 2007 (Otis 2007b). Analysts doubt that PDVSA has the technical expertise to operate the complex extra-heavy Orinoco projects (Ellsworth 2007), although the Venezuelan government—perhaps recognizing PDVSA's limitations—has sought to retain IOC participation as junior partners (Otis 2007b). Orinoco negotiations are currently in flux. The outcome of those negotiations will clarify to what extent the May 1 takeover represents political theater, a simple change in contract terms, or a significant reduction in IOC participation.²³ Ultimately, several IOCs will remain involved, but they will produce and

²² Questions about PDVSA's recovery have led to diverging estimates of total Venezuelan oil production. For 2005, PDVSA claims that Venezuela produced 3.274 bbl of crude/day (PDVSA 2006b, 6), but BP's estimate is roughly 10% lower, at 3.007 bbl/d (BP 2006).

²³ The May 1 takeover has political overtones because it coincides with Venezuelan Labor Day.

invest less than optimally because of the risk of future regulatory changes and further nationalization.²⁴

Analysis

The Venezuelan government collects enormous revenues from PDVSA, but its policies fail to maximize short-run revenues and risk harming the company over the long-run. Budgetary and extrabudgetary revenue collection mechanisms have flushed the Venezuelan government with cash, but the large size and unpredictability of those mechanisms cripple investment. According to outside analysts, PDVSA should invest between \$7.5 and \$8 billion per year to moderately increase production (Ecónanalítica 2007b, 8-9); the company actually invested only \$3.878 billion in 2005 and \$5.832 billion in 2006 (PDVSA 2007b, 841).²⁵ Production has also foundered. PDVSA lost substantial technical expertise after the 2002-03 strike, and the company's partially new workforce has been unable to maintain previous production levels. Over the long-term, the large size and unpredictability of government revenue collection, PDVSA's decreased technical capacity, and the company's increased control over oil production will probably reduce the efficiency of future hydrocarbon revenue generation. Government revenue collection will likely cut into needed investments and PDVSA will manage its newly acquired facilities less productively than IOCs.²⁶

²⁴ Some renegotiation of the terms will not deter IOCs from investing, because they signed the initial contracts at highly attractive rates (Mander & Hoyos 2007).

²⁵ Note that PDVSA's 2006-2012 plan overoptimistically projects significantly increased investment in future years (PDVSA 2007b, 10).

²⁶ An alternative, but less likely, scenario is that the government captures a higher revenue stream by restraining production as part of an effective OPEC-wide cartelization of oil prices.

Evidence of the effect of Venezuelan government policies on PDVSA is accumulating. The International Energy Agency noted in a March 2007 report that “PDVSA has already been straddled with a host of ‘extra curricular’ social spending obligations” and that because of these obligations and other requirements (e.g., buyouts of IOC shares in the Faja), “it is clear that cash is tight” (IEA 2007, 18). Some analysts believe that the government is collecting too many resources for the company to maintain needed investment. According to Econanalítica, 2006 financial “figures indicate that PDVSA seems to be following the same path that [Mexican NOC] PEMEX did during the 80s and 90s, by becoming an oil company destined to finance the State at the cost of efficient managing and the expansion of its production capabilities” (Econanalítica 2007a, 2).

PDVSA’s early-2007 public bond offer has heightened concerns about the sustainability of government revenue collection. The company announced a \$5 billion bond offer in 2007 before raising the offer to \$7.5 billion by early April of that year. Although the company slightly increased its cash flow between 2004 and 2006,²⁷ the bonds help compensate for the PDVSA funds diverted to meet government obligations. In early 2007, Patrick Esteruelas of the Eurasia Group stated that PDVSA “is overstretched to capacity with any number of needs” (Pearson 2007).²⁸

²⁷ PDVSA’s cash and equivalent of cash increased from US\$1.8 billion in at the end of 2004 to \$2.03 billion at the end of 2006 (PDVSA 2007c, 4). Note that these figures may represent individual points in time rather than long-term trends.

²⁸ The Venezuelan government has defended its revenue policies, but those defenses are unconvincing. From a financial point of view, the Venezuelan government has disputed claims that government revenue collection has led to cash flow problems. According to *El Nuevo Herald*, Energy Minister Ramírez stated that PDVSA “was in a good financial position,” noting that its debt-equity ratio of 22.8% is lower than that of many large IOCs (Reyes 2007). Unlike large IOCs, however, PDVSA is using its debt to fund Venezuelan social programs rather than investment, so the debt is less likely to generate future positive returns. The Venezuelan has also suggested that government spending might have a long-run positive impact on PDVSA’s financial standing, because social spending will improve the human capital of the

IV. PDVSA AS AN IMPLEMENTER OF POLITICAL OBJECTIVES

I now identify a few of PDVSA's many government-supporting actions. Because PDVSA does not explain the basis for all its decisions, this section is not comprehensive. Instead, I summarize two categories of government-supporting actions: (1) Those cases where the government compels PDVSA to direct revenues to non-government actors, like discounted gasoline sales; (2) and those cases where the government mandates that PDVSA make certain business decisions, such as forming partnerships with NOCs from Chávez-friendly governments. The primary difference between these two cases is that, in the former, the government directs the revenue to specific recipients, whereas in the latter the government mandates that PDVSA make decisions that potentially change the total amount of revenue and political benefits accruing from those actions. Both types of cases are summarized below. Based on these examples, PDVSA has taken some actions that conflict with its business objectives, though the extent and scale of those conflicts is unclear.

country and, ultimately, the company. The government has designed *Misión Ribas*, which provides secondary school education to adults, to complement PDVSA's business objectives by training many of the students in petroleum-related education (Ministerio del Poder Popular para Comunicación y la Información 2007). The effectiveness of this approach, however, depends on a range of factors, including the cost-effectiveness of social spending relative to other social policies. Few independent studies have evaluated the effectiveness of the recent increase in Venezuelan social spending. One study of *Misión Robinson*, which sought to reduce illiteracy from 2003-05, found that the program had "at most a small positive effect on literacy rates" (Ortega, Rodríguez, & Miguel 2006, 1). The results of this study may not be valid for other *misiones*; the various Venezuelan social programs may differ in effectiveness. Note, however, that the Venezuelan government directed \$12 billion of its social spending internationally (Econanalítica 2007a, 4). Because the government gave those monies to ideologically aligned countries, particularly in the developing world, they probably will have little positive impact on PDVSA's long-term financial health.

Directing Resources to Non-Government Actors:

Discounted Sales of Gasoline

One way in which the government forces PDVSA to share its resources with non-government actors is through the company's domestic sale of gasoline at a substantial discount from the world price. Various Venezuelan governments have subsidized gasoline for political reasons because the policy delivers benefits from oil wealth directly to the populace (albeit inefficiently); the current government has maintained the practice.²⁹ Oil subsidization, however, comes at a significant cost to PDVSA. Venezuelans consumed 547,000 b/d in 2006 (PDVSA 2007b, 820),³⁰ representing 20.6% of PDVSA's own production and 17.0% of total domestic production (derived from PDVSA 2007b, 818).³¹ PDVSA, along with other companies, sells gasoline domestically at a subsidized price of under \$0.20/gallon (Romero & Krauss 2007).³² The total cost of this subsidization, relative to market opportunity costs, is estimated to be at least \$9 billion annually (Romero & Krauss 2007).³³

For geopolitical reasons, the Venezuelan government has mandated that PDVSA provide smaller, but still significant, oil assistance programs to various foreign countries. PDVSA offers discounted oil sales, oil donations, and other support to Cuba, Bolivia, Argentina, Uruguay, and the Caribbean. The total cost of these programs for 2006 is

²⁹ In January 2007, Chávez announced that domestic fuel prices would rise, but in April 2007 the legislature decided that the government would not raise prices in the short-term (El Universal 2007).

³⁰ Domestic consumption has shifted in response to domestic supply and broader changes in the Venezuelan economy. Venezuela consumed 496,080 b/d in 2001, but consumption dropped to 465,190 b/d in 2003 following the 2002-03 PDVSA strike and then rebounded to 505,570 b/d by 2005 (OPEC 2005, 81).

³¹ For this comparison only, the paper relies on PDVSA production data to ensure that the comparison is uniform.

³² If trading for dollars on the black market, Mares and Altamirano note that the dollar-equivalent price of gasoline is only \$0.09 (Mares & Altamirano 2007, 14). By comparison, the U.S. price fluctuated between \$2 and \$3/gallon during 2006 (EIA 2007) (including or excluding the average 19% rates of state and federal taxes (EIA 2006a)).

³³ Mares and Altamirano estimate the opportunity cost at more than \$10 billion (Mares & Altamirano 2007, 15).

approximately \$1.73 billion (see PDVSA 2007b, 857-59). See Table 5 for more information. To improve its image in the United States (as well as perhaps to needle the Bush administration), the Venezuelan government sold nearly 40 million gallons of heating oil at discounted prices to 181,000 people in the northeast United States during the winter of 2005-06 (PDVSA 2006b);³⁴ the program continued in the 2006-07 winter, targeting New York City (PDVSA 2006c).

Table 5. PDVSA International Programs, 2006 (\$US millions)	
	2006
Cuba ³⁵	1347.0
Argentina	188.7
Uruguay	149.9
Caribbean ³⁶	40.2
Bolivia	3.3
Total	1729.1

Source: PDVSA 2007b, 857-59.

PDVSA's discounted oil sales programs moderately interfere with PDVSA's business practices. Diversion of revenues may cause adverse environmental effects and provoke widespread smuggling (Rother 2006), but the diversion does not generally affect PDVSA's business decisions, with two important exceptions. First, PDVSA has less gasoline available to sell at market price and therefore fewer resources. Second, the government redirects administrative resources from production into program management so as to administer the programs.

³⁴ In launching the program, the Venezuelan government purchased full-page advertisements in several major U.S. newspapers; CITGO sold the oil at a 40 percent discount (Melia 2006).

³⁵ Venezuela's agreement with Cuba gives Cuba oil in exchange for medical services to the Venezuelan poor. This agreement therefore supports the Venezuelan government's geopolitical and social objectives, albeit at great cost to Venezuela.

³⁶ PDVSA supports infrastructure works in the Caribbean (PDVSA 2007b, 859).

Altering Business Decisions:

Partnerships with NOCs from Chávez-Friendly Governments

The government also obligates PDVSA to make business decisions for geopolitical reasons. While these types of obligations are less overtly costly than the subsidized oil programs, they have the potential to adversely affect PDVSA for a longer period of time, because they risk locking in the company's future business behavior.

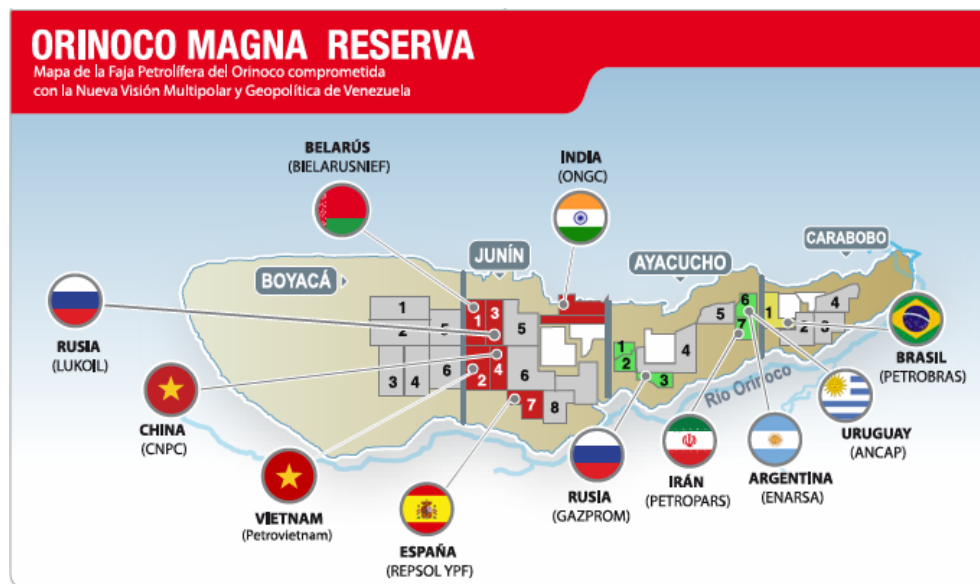
One example of government-imposed business decisions is PDVSA's "Magna Reserve" project.³⁷ Designed to certify PDVSA's substantial oil reserves in the Orinoco region of Venezuela, the project operates through partnerships between PDVSA and foreign companies—mostly NOCs—from Chávez-friendly governments (Otis 2007a).³⁸ PDVSA has acknowledged the project's underlying geopolitical motivations. A company newsletter states that the project will contribute to the "creation of a multipolar world," with partners from Argentina (Enarsa), Belarus (Bielarusnief), Brazil (Petrobras), China (CNPC), India (ONGC), Iran (Petropars), Russia (Grazprom and Lukoil), Spain (Repsol YPF), Vietnam (Petrovietnam), and Uruguay (ANCAP) (PDVSA 2006c, 11).³⁹ For a map of NOC partners, see Figure 2 below.

³⁷ Note that even without government mandates, PDVSA officials might choose to implement some of these non-business-based decisions. The 2002-03 strike radically transformed the composition of PDVSA personnel, making the company more aligned with Venezuelan government objectives.

³⁸ Chávez called the project the largest "ever envisioned in Latin America and one of the most important projects worldwide" (Otis 2007).

³⁹ Note that the project has other motivations: In addition to enhancing relationships with Chávez-friendly governments, the Magna Reserve project could increase Venezuela's OPEC production quotas (which are based on reserves) and therefore its influence within OPEC (Otis 2007). See Analysis below for more discussion.

Figure 2. Map of NOC Partners in the Magna Reserve Project



(Source: PDVSA)

As a business project, the Magna Reserve project makes, at best, mixed sense. Most of the NOCs involved—with the exception of Lukoil—have little experience with heavy oil (the type found in the Orinoco) (Otis 2007a).⁴⁰ The project may yield some benefits, such as increasing Venezuela's—and indirectly the company's—influence within OPEC (Wilpert & Wanger 2005), improving PDVSA's bargaining position with purchasers, and raising the country's—and indirectly the company's—standing in the financial community.⁴¹ But the costs of forgoing partnerships with skilled IOCs likely outweigh any indirect benefits from NOC certification.

The Venezuelan government has mandated that PDVSA carry out domestic and international projects for largely political reasons.⁴² For instance, the government has

⁴⁰ Note that third party operators may be able to fill the gap in technical expertise.

⁴¹ See also Boué 1993, 45-46 (noting that PDVSA overstated its reserves in 1990s because of the political motivations).

⁴² Note that government motives in these cases are not always solely – or even primarily – nationalistic or geopolitical. The government has mandated PDVSA's Orinoco project, for example, in part to promote employment in the interior and decrease overcrowding along the coast (PDVSA 2007f).

relied on PDVSA financing to buy out large Venezuelan companies. In February 2007, PDVSA paid \$739 million to U.S.-owned AES for the purchase of Electricidad de Caracas (AES Corp 2007, 3). PDVSA bought out Venezuelan telecommunications company Compañía Anónima Nacional Teléfonos de Venezuela (Cantv) in May 2007 (Compañía Anónima Nacional Teléfonos de Venezuela 2007). Possible moves to nationalize the steel, banking (EIU 2007), and healthcare (Bradley 2007) industries are currently underway. In April 2007, Energy Minister Ramírez suggested that PDVSA might sell its U.S. gulf coast refineries; analysts have interpreted this announcement as part of Venezuelan efforts to reduce exports to the United States (Romero & Krauss 2007).⁴³ Separately, the Venezuelan government has proposed that PDVSA help construct a South American natural gas pipeline (Embassy of the Bolivarian Republic of Venezuela 2006), although analysts doubt the commercial viability of the project.

Analysis

The Venezuelan government has mandated that PDVSA spend significant revenues in support of government objectives. Estimated conservatively, these actions deprive PDVSA of at least \$11 billion in potential revenues per year, or nearly 20% of the company's domestic revenues (derived from PDVSA 2007h). The most expensive state-mandated action is the domestic subsidized gas program, which costs some \$9 billion per year (Romero & Krauss 2007). The company spends another \$1.7 billion per year on foreign oil assistance programs (PDVSA 2007b, 857-59). Non-recurring

⁴³ Nevertheless, even a privately-operated PDVSA might choose to reduce its dependence on U.S. exports if it believed that the United States was likely to restrict imports of Venezuelan oil because of political disagreements between Venezuela and the United States.

government-mandated actions, such as PDVSA financing of electricity and telecommunications companies, probably cost the company at least \$300,000 per year.⁴⁴

One major result of government-mandated PDVSA actions is to give the state a larger role in the Venezuelan economy. Formerly privately-owned Electricidad de Caracas, which had once billed itself as the “largest private company in Venezuela” (Electricidad de Caracas 2007a), is now “lighting the road to socialism” under government control (Electricidad de Caracas 2007b). In June 2007, Venezuelan Vice President Rodríguez put a new management team in charge of Electricidad de Caracas (Ministerio del Poder Popular para Comunicación y la Información 2007b). Similarly, the formerly private telecommunications company, Cantv, has become “aligned with the vision of the country” since its May 2007 nationalization (Compañía Anónima Nacional Teléfonos de Venezuela 2007). Cantv’s strategic objectives now include supporting the transformation of the state and converting itself into a socialist company (Compañía Anónima Nacional Teléfonos de Venezuela 2007). The strategic takeovers of the electricity and telecommunications industries, in many ways, mirror the government’s partial transformation of PDVSA in 2003: Instead of leaving the company structures intact, the government is redesigning those structures to support revolutionary ideals.

The Chávez administration’s takeover of private industries is likely to increase its domestic influence but negatively impact the economic performance of both PDVSA and Venezuela. Government influence will probably grow because the formerly private companies can project government goals publicly⁴⁵ and carry out those goals in their

⁴⁴ As noted above, PDVSA paid \$739 million to U.S.-owned AES for the purchase of Electricidad de Caracas in February 2007 (AES Corp 2007, 3).

⁴⁵ Cantv, in particular, is likely to serve as an effective channel for communicating government views.

contracting, procurement,⁴⁶ and other activities. Increased government influence over the Venezuelan economy comes at a cost, however. For PDVSA, government-obligated spending has significantly reduced the available resources for investment. And for the Venezuelan economy, the transfer of company control from private to public hands is likely to reduce those companies' efficiency. In opting for direct control of formerly private industries, the government has largely eschewed the benefits of using regulatory and competition policy to spur domestic market competition. Although a few of the nationalized industries—particularly those in high-externality sectors (e.g., infrastructure)—might become more effective under state control,⁴⁷ most will become less competitive⁴⁸ and reduce investment.⁴⁹

The Venezuelan government's reliance on PDVSA actions has created an overlap between government and NOC goals. Both the Venezuelan government and PDVSA, for example, have combined efforts to raise petroleum prices on international markets.⁵⁰ In carrying out this strategy, government and PDVSA have worked together integrally. On the government side, oil ministry representatives have adopted an increasingly hawkish stance in OPEC production-setting meetings (Millard 2006) and announced the opening of an oil intelligence and policy office at OPEC headquarters in Vienna (PDVSA

⁴⁶ The government may influence procurement behavior, for example, by mandating that Electricidad de Caracas and Cantv contract for services exclusively with social cooperatives, rather than private enterprises. These government mandates will probably adversely affect those companies' performance.

⁴⁷ For net positive economic benefits to occur, the expected cost of private failure (from not internalizing externalities) must outweigh the expected cost of government failure (from failing to administer the industry effectively); and nationalization must achieve government goals more effectively than regulation. It is unlikely that any of the nationalized industries meets these conditions.

⁴⁸ Efficiency falls because the Venezuelan government does not face, *inter alia*, the same competitive pressures to improve as a private operator.

⁴⁹ Investment decreases because private operators are less willing to invest if they believe that the government may expropriate their business in the future.

⁵⁰ PDVSA's 2006-2012 plan envisions increasing production from less than 3 to 5.8 million b/d by 2012 (PDVSA 2007b, 10). As Forero notes, however, Venezuela also has taken on a more aggressive role within OPEC, advocating "oil nationalism" (Forero 2006).

2007e).⁵¹ This price-raising strategy may not succeed over the long-term, however, because other OPEC members will not surrender their negotiating power easily, and effective cartelization of oil production has proved difficult in the past. But the integrally linked relationship between PDVSA and government in pursuing higher oil prices illustrates how government priorities infuse NOC objectives.

V. PDVSA AS A BUSINESS: WHAT'S LEFT?

In addition to its roles as government funding and implementing agent, PDVSA has developed a business model that embodies Venezuelan government objectives. In its *Plan Siembra Petrolera* (Oil Sowing Plan), PDVSA has set forth business plans for the medium-term (2005-2012) and long-term (2005-2030) (PDVSA 2007f). For 2005 to 2012, the plan focuses on six areas: The Magna Reserve certification project; the Orinoco oil development project; the Delta-Caribbean gas development project; increasing refining capacity; development of infrastructure, particularly gas pipelines; and integration of energy networks across the Western Hemisphere (PDVSA 2007f). Many of these areas correspond with Venezuelan government objectives: The Magna Reserve project supports government alliances with Chávez-friendly governments;⁵² the Orinoco project is partially designed to alleviate overcrowding near the Venezuelan coast; and the energy integration plan leverages Venezuelan influence within the region (PDVSA 2007f).

⁵¹ Oil prices could of course rise to a point where they harm PDVSA's objectives, if those prices sufficiently dampen oil demand. To maximize revenues, PDVSA's goal is to set prices at, but no higher than, monopoly levels. Because OPEC does not possess a monopoly on oil, PDVSA arguably has an interest in raising oil price above their current levels. (This interest is uncertain, however, because in a dynamic environment PDVSA must also consider, inter alia, the effect of oil price increases on the consuming countries' economies.)

⁵² Government objectives have heavily influenced this project; see "PDVSA as State Implementing Company" for more information.

This section considers PDVSA's business model in greater detail, discussing its investment, production, exploration and certification, refining, and natural gas strategies.

Investment

PDVSA proposes investing substantial resources to carry out its 2005-2012 plan, but that plan depends on substantial private sector participation and unrealistic assumptions. According to the plan, the Venezuelan oil sector would receive \$56 billion in investment from 2005 to 2012; 30% of that amount would come from the private sector (PDVSA 2007f). Oil Minister Ramírez admitted in October 2006 that, “[without] the private sector’s participation we will not be able to develop this plan” (PDVSA 2006b).⁵³

PDVSA is probably not investing enough resources to reach the targets set forth in its plan, and these targets are, in any event, insufficiently ambitious. Mares and Altamirano note that PDVSA is not currently investing adequately to meet the 2005-2012 goals; PDVSA expects that other NOCs will help fill the investment gap (Mares & Altamirano 2007, 68). However, these NOCs will probably not invest as much as PDVSA estimates. Moreover, Econalítica suggests that the plan, even if met, is insufficient: PDVSA needs to invest \$7.5 and \$8 billion to expand production (Ecónanalítica 2007b, 8-9), much more than the currently planned amount.

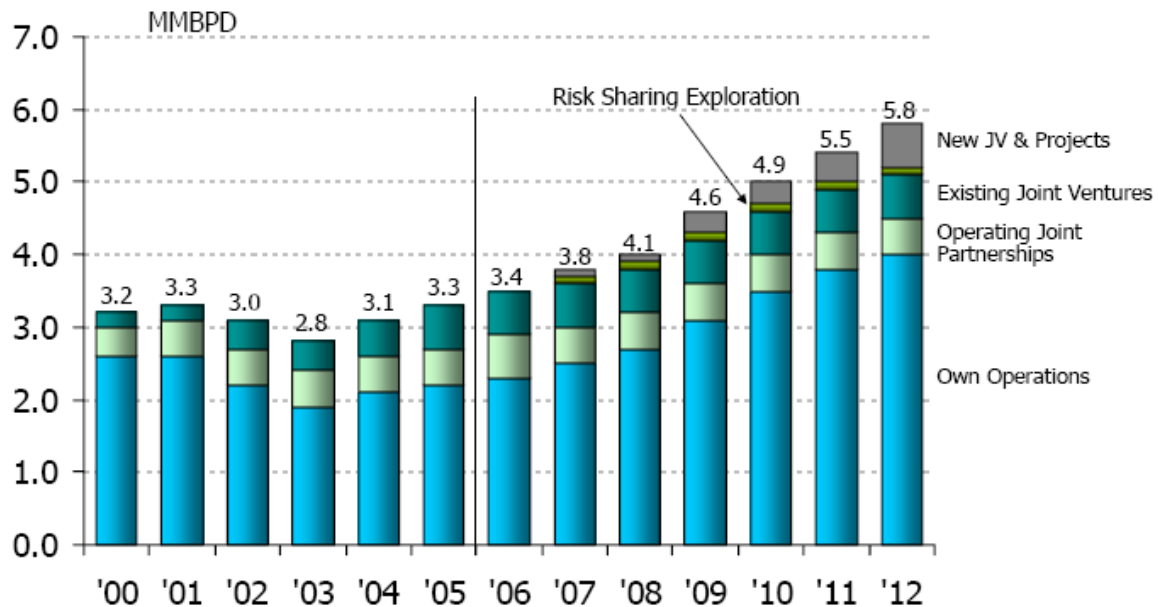
Production

⁵³ A report by the Embassy of the Bolivarian Republic of Venezuela provides detailed information on private section participation (Embassy of the Bolivarian Republic of Venezuela 2006).

PDVSA's plan calls for a substantial increase in oil production, though PDVSA is unlikely to achieve that increase. The plan envisions expanding PDVSA production from the official figure of 3.274 million barrels per day in 2007 to 5.837 million barrels per day in 2012 (PDVSA 2006c, 3).⁵⁴ Of this amount, PDVSA would increase its sole operator production from the official figure of 2.907 million b/d today to 4.019 million b/d by 2012 (PDVSA 2006c, 3). PDVSA-majority joint ventures in the Orinoco, including those migrating to PDVSA by May 1, 2007, account for the difference between PDVSA sole-operator and total production. According to these calculations, the Orinoco would provide 1.239 million b/d by 2012, more than 300% above the current production level of 368,000 b/d (PDVSA 2007b, 3). See Figure 3 for more information. Note that an increasing share of this production would be sold outside the United States.

⁵⁴ Note that the official PDVSA figures are disputed, including the PDVSA sole operator current production rate of 2.907 million b/d. See section on "PDVSA Today: A Statistical Profile" above. In September 2007, PDVSA Vice President told reporters that he expects Orinoco production to rise from 10 to 15% in 2008 (Reuters 2007).

Figure 3. Venezuelan Government Production and Production Estimates 2000-2012



Source: Embassy of the Bolivarian Republic of Venezuela 2006.

PDVSA's production plans are probably not feasible. Because PDVSA production is already falling short of publicly stated levels, the company probably does not have the capacity to significantly expand that production in the near-term. Planned investment levels (described above) are also inadequate to expand production by the planned amounts (Mares & Altamirano 2007, 70).

Certification and Exploration

The government has focused much more on certification than on exploration (as noted in "PDVSA as a Government Implementing Agent," above). The 2005-2012 plan lists the Magna Reserve certification project, but not exploration, as one of PDVSA's priorities (PDVSA 2007f). One reason why PDVSA has not emphasized exploration is

because Venezuela has recently enjoyed a high rate of exploration success: 46%, compared to 12% in the rest of the world between 1997 and 2003 (Embassy of the Bolivarian Republic of Venezuela 2006). PDVSA is unlikely, however, to maintain this rate of success in the future.

Refining

As with production and exploration, PDVSA aims to substantially boost refining activities in the medium-term. The *Plan Siembra Petrolera* calls for increasing refining capacity from 3.1 to 4.1 million b/d by 2012 (PDVSA 2007b, 3). Domestically, the plan contemplates constructing three refineries away from the Caribbean coast: the Cabruta refinery, in the Orinoco, to refine 400,000 b/d of extra-heavy crude; the Caripito refinery, near the Orinoco delta, to process 50,000 b/d for asphalt; and the Santa Inés refinery, in the west, to process 50,000 b/d for the domestic fuel market (Embassy of the Bolivarian Republic of Venezuela 2006). On the international front, PDVSA plans to construct, expand, and refit refineries in several Chávez-friendly countries (Brazil, Cuba, and others) to process extra-heavy crude from the Orinoco (PDVSA 2006b). See Table 6 for more information.

Table 6. PDVSA Refining Activities: Currently and Planned for 2012, all figures million b/d		
	Currently	2012 Planned
<i>Within Venezuela</i>	1.3	1.8
<i>Outside Venezuela</i>	1.8	2.3
Total	3.1	4.1

Source: PDVSA 2007b, 3.

PDVSA's refining strategy supports both company and government objectives. If production rises, PDVSA must also expand refining capacity to maintain its integrated organizational structure. For the government, increased refining both in Venezuela and in Chávez-friendly countries reduces the country's dependence on refining within the United States.

Natural Gas

Lastly, PDVSA proposes expanding its natural gas production and infrastructure network. The major area for development is off the coast of eastern Venezuela near the Orinoco delta (PDVSA 2007f), though offshore areas in the northwest also show potential (PDVSA 2007f). PDVSA plans to transport some of its natural gas production to neighbors through various newly-constructed pipelines. Construction of one pipeline, connecting Venezuela and Colombia, is expected to conclude in May 2007 (Embassy of the Bolivarian Republic of Venezuela 2006). More ambitiously, PDVSA has called for construction of a South American natural gas pipeline (Embassy of the Bolivarian Republic of Venezuela 2006), although this project is probably not economically viable.

PDVSA's natural gas objectives support those of the Venezuelan government, yet the company is unlikely to fully achieve them. PDVSA's South American gas pipeline would, if successful, help the Venezuelan government build deeper political alliances within the region. Other governments, particularly Brazil's, have been reluctant to commit funding for the pipeline because they doubt its feasibility.

Analysis

PDVSA's business model superficially builds on its strengths as a vertically integrated energy provider, but the Venezuelan government's objectives shape the contours of that model and its revenue demands hamper its implementation. The business model calls for significant production growth but allots insufficient funds for investment and exploration to achieve that growth. Government objectives probably explain, in part, why PDVSA chose to concentrate on some politically-beneficial areas (e.g., infrastructure construction) but not others (e.g., exploration). Although the business model does not depend on high oil price levels—the reference price for 2007 is only \$29/barrel (Upstream 2007)—PDVSA is not investing adequately, even at the current high price levels, because of heavy government revenue collection demands. PDVSA probably cannot implement its plans in the current environment of government fiscal demands.

VI. CONCLUSIONS

In this paper, I suggest that the Chávez government has largely transformed PDVSA from a commercially managed company to an integral government agent. My organizing framework for PDVSA takes three forms: government revenue collecting company; government implementing company; and viable business.

In this conclusion, I attempt to put PDVSA's framework into comparative context by analyzing the company along the NOC research protocol variables (PESD 2007). The research protocol includes three independent variables: A) State goals, capabilities and relationship with the oil sector; B) management; and C) technology and hydrocarbon

resources. These independent variables help explain the two dependent variables of performance and strategy. Each of these variables is discussed below. I close the paper with a few final observations.

Independent Variables

Of the independent variables considered, the Venezuelan government's relationship with the oil sector is by far the most important in explaining PDVSA's current strategy and performance. PDVSA management, by contrast, has served as more of a facilitator for carrying out government objectives. Venezuela's favorable geological conditions have allowed PDVSA to continue producing large quantities of oil despite government interference, but this strategy is not tenable over the long term.

State Goals, Capabilities, and Relationship with the Oil Sector

The Venezuelan government's goals for the oil sector are to achieve Chávez's immediate funding and implementing priorities. Even though the government has a long time horizon—Chávez has proposed reforming the constitution so that he can serve as president for an unlimited number of terms—its revenue collection and implementation strategy has focused on the short-term. As noted above, PDVSA gave the state and state-mandated beneficiaries approximately 79% of its potential gross national revenues in 2006.⁵⁵ The government probably has adopted a short-term strategy because Chávez—who enjoys near-complete control of the revenue disbursement process—prioritizes immediate objectives over revenue sustainability. To the extent Chávez takes account of

⁵⁵ See the sections above on “PDVSA as a Revenue Producing Company” and “PDVSA as a State-Implementing Company” for a breakdown of these figures.

long-term concerns, he probably believes that immediate social spending and nationalization will consolidate his rule through improved social indicators and increased state control of the economy.

The Venezuelan government has tremendous capacity to achieve its spending goals from the oil sector through punishing rent collection mechanisms. As detailed above (see “PDVSA as a Revenue-Collecting Agent”), the government imposes heavy budgetary obligations and somewhat lighter—but growing and highly uncertain—extrabudgetary obligations on the company. Budgetary obligations include an effective royalty rate of 33 1/3%, a post-cost income tax rate of 50%, and dividends (calculated once the government has imposed all royalties, taxes, and extrabudgetary social obligations). In 2005 and 2006, PDVSA gave the government \$25.5 and 27.4 billion in budgetary revenues, respectively (PDVSA 2007h). The extrabudgetary obligations center on three areas: the Fund for National Development (FONDEN); the *misiones*; and other social supports, such as the *fideicomisos*. These extrabudgetary obligations are smaller than the budgetary ones—totaling \$6.9 and \$13.8 billion in 2005 and 2006, respectively (PDVSA 2007b, 856)—but are highly unpredictable. PDVSA contributed nothing at all to extrabudgetary obligations before 2003 (PDVSA 2007b, 856). The heavy, unpredictable nature of these obligations discourages investment. A March 2007 report by the International Energy Agency speculates that government obligations on PDVSA have tightened the company’s cash flow (IEA 2007, 18).

Because of the strong ties between government and management, the Venezuelan government also has substantial capacity to control PDVSA actions. As discussed

immediately below, PDVSA management is stocked with pro-Chávez allies. Management and government objectives have thus begun to coincide.

Management

PDVSA management once facilitated strong company performance and effective strategy but now serves mostly as a conduit for realizing the Venezuelan government's ambitions. Before PDVSA's 2002-03 strike, PDVSA management was highly professionalized and technocratic (Tinker-Salas 2005). As noted above (see "Historical Background on PDVSA"), the company successfully carried out the 1990s *apertura* plan to increase company revenues and cement IOC partnerships. PDVSA's professionalism also helped insulate the company from interference; the company promoted itself as, and eventually became, a parallel power to government institutions (Tinker-Salas 2005). At the height of its influence, PDVSA president Luis Giusti helped negotiate an agreement between the government and International Monetary Fund (IMF) (Latin American Data Base 1996). Now, however, the Venezuelan government exerts near-complete control over PDVSA management. The government's Minister of Energy and Petroleum, Rafael Ramírez, is also PDVSA's president; and the government's Vice-minister of Hydrocarbons, Bernard Mommer, is a PDVSA external director (PDVSA 2007g). Following the 2002-03 strike, the government purged most opposition members from the company. Those remaining are either loyal to the government or effectively hiding their opposition.⁵⁶

⁵⁶ Some technically-skilled former PDVSA employees who participated in the strike continue to work for the company as outside consultants.

Chávez's purge of PDVSA former management also has damaged the company's capacity to carry out activities. As noted above, the company lost 18,000 employees following the strike (Harman 2006), including all top managers. Probably one reason why PDVSA has failed to return to its pre-strike production levels is because the company's new management team is not as competent.⁵⁷ Even some government supporters admit the strike has adversely affected the company's profitability (Markovits & Kennedy 2007) (though in other contexts those supporters argue, unconvincingly, that PDVSA has recovered its pre-strike production levels).

Technology and Hydrocarbon Resources

PDVSA enjoys considerable hydrocarbon resources, despite some technical challenges in developing those resources. Because of untapped reserves in the country's Orinoco belt, Venezuelan hydrocarbon—particularly oil—reserves hold tremendous potential. But, much of its untapped oil is challenging to develop, and its non-associated natural gas reserves are modest. As detailed in Appendix A, current Venezuelan oil reserves are between 80-90 billion barrels (Otis 2007a; BP 2006),⁵⁸ making them roughly the sixth largest in the world.⁵⁹ Uncertified deposits in the country's interior Orinoco region could eventually give Venezuela the world's largest reserves, at some 313-316

⁵⁷ Other reasons include the loss of skilled personnel—especially engineers—and improper re-activation of fields following the strike.

⁵⁸ In March 2007, the *Houston Chronicle* reported proven Venezuelan reserves at 87.6 billion barrels (Otis 2007). BP (BP) and the U.S. Energy Information Administration (USEIA) estimates are similar—79.7 billion barrels—to those of the *Houston Chronicle* but do not incorporate recent certifications (BP 2006; USEIA 2006).

⁵⁹ In comparison with previous year BP figures (BP 2006).

billion barrels.⁶⁰ However, most Orinoco oil is extra-heavy and bituminous, requiring heating and upgrading to market commercially. Average API gravity in the region is less than 10 degrees, though technologies can improve the density to between 16 and 32 degrees (Goldman Sachs 2006, 254-454).⁶¹ Moreover, the country's natural gas reserves potential is modest; roughly 90% of the natural gas is in associated fields, limiting its production potential (USEIA 2006).⁶²

Dependent Variables

The independent variables help explain two types of dependent variables: performance and strategy. Performance refers to the efficiency of PDVSA's operations, whereas strategy encompasses PDVSA's partnerships with other oil companies and long-term vision. Both are discussed below.

Performance

PDVSA's performance has suffered significantly under the Chávez administration, particularly its production capacity. The U.S. EIA estimates that PDVSA's production probably decreased by 30% since the 2002-03 strike (EIA 2006b). Most other performance figures have not shown a performance decline, because they date from 2004

⁶⁰ Numerous PDVSA documents make this argument (PDVSA 2006d (stating that reserves certified by Ryder Scott has increased Venezuela's reserves to "more than 313 barrels"); PDVSA 2007d (claiming that the country has 316 billion barrels in reserves)). President Chávez and others within the Venezuelan government have echoed the argument (PDVSA 2007a (noting President Chávez's claims)).

⁶¹ The technology involves lifting of heavy oil using production from horizontal wells and then transportation of that oil via pipeline to a de-coking upgrader facility (Goldman Sachs 2006, 254-404).

⁶² BP estimates that Venezuela has 152 trillion cubic feet of reserves, making Venezuela's reserves among the ten largest in the world (BP 2006). Nevertheless, technical constraints limit its potential. In 2005, Venezuela marketed only 41.8%, but reinjected 42.7%, of its natural gas production, using the rest of its natural gas for flaring and shrinkage (derived from OPEC 2005, 65).

and performance, in any event, lags policy by several years. As of 2004, PDVSA earned \$31.35 per barrel of oil produced, moderately more efficient than most NOCs but substantially less efficient than most IOCs (Myers Jaffee 2007). Similarly, PDVSA's estimated 2002-2004 technical efficiency is better than most, but not all, NOCs and worse than all major IOCs (Eller, Hartley, and Medlock 2007).⁶³

The research protocol independent variables help explain PDVSA's decreased performance. The Venezuelan government's focus on using PDVSA to fund and implement government objectives has constrained company investment and adversely affected the company's profitability. Over time, diminished investment is likely to further inhibit production capacity and reduce the efficiency of operations. Changes in PDVSA management have also weakened PDVSA performance, because many of the company's managers prioritize ideological, rather than commercial, goals. Moreover, new PDVSA management and, especially, technical staff have yet to harness the company's production capacity as effectively as their pre-strike counterparts. The major independent variable buoying PDVSA's production levels are Venezuela's substantial technological and geological resources.

Strategy

PDVSA's strategy focuses on limiting its number of partnerships with IOCs and increasing those with NOCs, especially from Chávez-friendly governments. As noted above (see "PDVSA as an Implementer of Political Objectives"), PDVSA has launched the "Magna Reserve" certification project, in part, to achieve government geopolitical

⁶³ "Major" IOCs are ExxonMobil, BP, Shell, Chevron, and ConocoPhillips (Eller, Hartley, and Medlock 2007).

goals. A company newsletter states that the project will contribute to the “creation of a multipolar world,” with partners from Argentina (Enarsa), Belarus (Biellarusnief), Brazil (Petrobras), China (CNPC), India (ONGC), Iran (Petropars), Russia (Grazprom and Lukoil), Spain (Repsol YPF), Vietnam (Petrovietnam), and Uruguay (ANCAP) (PDVSA 2006c, 11).

PDVSA’s strategy depends on its continuing access to technical expertise from IOCs and gap-filling from foreign NOCs. Despite the government’s aggressive May 2007 takeover of IOC facilities in the Orinoco, several IOCs have continued working with the government so as to maintain a stake in future hydrocarbons development. As of October 2007, Total, and Chevron continue to operate in the Orinoco fields (Gallegos 2007). Increasingly, however, PDVSA has turned to Chávez-friendly NOCs to provide the technical expertise for developing its resources.

As with performance, the research protocol variables considered account for changes in PDVSA strategy. One of the Venezuelan government’s primary objectives for the oil sector is to use that sector to curry favor with Chávez-friendly governments. PDVSA, through its NOC partnership activities (and, separately, its foreign oil aid programs), has helped carry out that objective. PDVSA management, in turn, has worked to implement this objective, in part because of its ideological affinity with the Chávez administration. In contrast, Venezuela’s geological conditions have worked against PDVSA’s strategy, because many NOCs lack experience in developing heavy oil fields. PDVSA has nevertheless sought out opportunities to partner with NOCs wherever possible.

Final Observations

The Venezuelan government has relied on PDVSA to fund and implement many of its short-term objectives, but that strategy is unsustainable. The Venezuelan government has set its revenue collection at too high of a rate, aggregated across all of its revenue collection mechanisms, to provide PDVSA with sufficient resources for investment. Moreover, some of the government tools for collecting that revenue—particularly on the extrabudgetary side—are too uncertain for PDVSA to plan effectively.

The government's long-term objectives for PDVSA are also suspect. Its focus on price more than production may not succeed in the long-run because the Venezuelan government lacks sufficient negotiating power within OPEC to convince members to restrain production. Moreover, factors outside direct OPEC control (production from non-OPEC members, supply of oil alternatives, oil demand, et cetera) will largely determine future oil prices.

Finally, PDVSA's international diversification strategy is likely to be only partially successful. The company plans on selling an increasing proportion of oil outside the United States (e.g., China), for both geopolitical and risk management reasons. However, the economics of that strategy—including transportation costs and refining capacity—invite doubts.

PDVSA and the Venezuelan government have switched roles during the past ten to fifteen years. During the 1990s *apertura*, PDVSA had permeated the Venezuelan government to such an extent that its president at that time, Luis Giusti, helped negotiate an IMF agreement (Latin American Data Base 1996). The situation now is almost completely the reverse: the Venezuelan government controls PDVSA management to an

extent that the company seeks to fulfill government goals even where those goals undercut the company's long-term viability.

In all likelihood, neither the current nor previous type of government-NOC relationship is sustainable. The 1990s-era PDVSA could not wall itself off from an economically dependent Venezuelan government. And the Chávez administration, in turn, is unlikely to have the capacity pursue its policy objectives without greater accommodation for the company's financing needs. PDVSA has not yet found a consensus, long-term model for functioning effectively within Venezuelan society. Until this consensus is reached, the Venezuelan people's disenchantment with the oil sector is likely to persist.

APPENDIX: NATURAL CONDITIONS AFFECTING PDVSA

Venezuela has among the world's largest oil and, less significantly, natural gas reserves, though estimates vary because of technical and, potentially, political questions.

Petroleum

Oil reserves within Venezuela are anywhere from the world's sixth-largest to the largest, with significant potential for future development in the Orinoco region; these figures, however, are subject to some technical and political uncertainty. The Houston Chronicle, in accord with other outside estimates,⁶⁴ recently reported proven Venezuelan reserves at 87.6 billion barrels, making them the sixth-largest in the world (by comparison with previous year BP figures) (Otis 2007a). Estimated reserves are much larger: The Venezuelan government and PDVSA report 313-316 billion barrels in estimated reserves, which would give the country the world's largest.⁶⁵

Venezuelan proven and estimated reserves differ for technical and, perhaps, political reasons. The technical uncertainty is that outside sources have, up until now, classified extra-heavy Orinoco petroleum in the same category as coal, rather than oil, because of its uses as boiler oil; PDVSA, however, has experimented to make that oil more transportable and refinable (Wilpert & Wanger 2005).⁶⁶ Recent increases in oil

⁶⁴ BP (BP) and the U.S. Energy Information Administration (USIEA) estimates are similar—79.7 billion barrels—to those of the Houston Chronicle but do not incorporate recent certifications (BP 2006; USEIA 2006).

⁶⁵ See PDVSA 2006d (stating that reserves certified by Ryder Scott has increased Venezuela's reserves to "more than 313 barrels"); PDVSA 2007d (claiming that the country has 316 billion barrels in reserves). President Chávez and others within the Venezuelan government have echoed these claims. See PDVSA 2007a (noting President Chávez's claims).

⁶⁶ For support of PDVSA's claims, see Turner 2006 (noting that "Venezuela is supposed to hold five times the reserves of Saudi Arabia"). Others have adopted a more skeptical position, noting that reserve figures are unreliable for at least three reasons. According to one source, PDVSA had historically over-reported its reserves because they served as the basis for OPEC production quotas. Venezuela exceeded its OPEC quota

prices, moreover, have made the extra-heavy oil more commercially viable (Fox & Wilpert 2006). Outside sources, which do not share Venezuela's political objectives,⁶⁷ may decline to recognize Venezuela's reserves in comparably aggressive fashion.

Geographically, Venezuelan reserves are traditionally divided into four regions, though the Orinoco region, the country's fourth, holds the greatest long-term potential. The traditional reserves are found in three sedimentary basins: Zulia; Barinas-Apure; and Oriental. These reserves are widely distributed across the country: Zula is located in and around Lake Maracaibo; Barinas-Apure is south of Lake Maracaibo; and Oriental is in eastern Venezuela. More recently, a fifth region, around the Orinoco (or Faja), has begun to produce significant oil and is the site of most recent oil reserve certifications. See Figure 1 for a map of these reserves.

PDVSA has traditionally generated most of its production from reserves in Zulia and Oriental, though nationalization and increasing production from the Orinoco has made that region much more important over time. As of 2005, the distribution of oil production by sedimentary basin, including those in the Faja, was as follows: Zulia, 38.3%; Barinas-Apure, 2.7%; Oriental, 49.8% (PDVSA 2007b, 16); the Faja region, for which PDVSA takes majority ownership in May 2007, 11.2% (PDVSA 2007b, 16). Note that production in the Faja has grown significantly, from 133,000 b/d in 2001 to 368,000 in 2005 (PDVSA 2007b, 16).

in 1994, and by 1998 PDVSA was exceeding its quota by 800,000 barrels (Kozloff 2006, 11). Second, the government projects a 20 percent drop in reserves in the Orinoco, but a lower rate may be more realistic (Mares & Altamirano 2007, 70-71). Lastly, price substantially affects the amount of reserves; significant oil price declines would take many high-cost deposits off of the market.

⁶⁷ Arguably, the USEIA may underestimate the size of Venezuelan reserves because of countervailing U.S. government objectives to minimize the level of Venezuelan reserves.

Figure 4. Map of Venezuelan oil fields



Source: Global Security 2006.

Natural Gas

Gas reserves, while less significant than oil, are also substantial. The *Oil and Gas Journal* and BP estimate that Venezuela has 151 and 152 trillion cubic feet of reserves (Tcf), respectively, making Venezuela's reserves among the ten largest in the world (BP 2006); PDVSA's estimates of natural gas reserves do not significantly differ. However,

roughly 90% of Venezuela's natural gas is in associated fields, limiting its production potential (USEIA 2006). Recent production statistics reflect these limitations; in 2005, Venezuela marketed only 41.8%, but reinjected 42.7%, of its natural gas production, using the rest of its natural gas for flaring and shrinkage (derived from OPEC 2005, 65).

Legal Ownership

Venezuela's oil and natural gas reserves are the inalienable property of the state, not PDVSA. Article 12 of the Venezuelan Constitution and Article 3 of the Hydrocarbons Organic Law establish public ownership over all mineral and hydrocarbons deposits in the national territory (PDVSA 2006a). Reserves discovered by private firms are also owned by the state (Mares & Altamirano 2007, 38).

Geologic Conditions

Venezuelan oil is generally difficult to extract, because most fields are heavy and some are mature. Across all fields, the average API gravity of the crude oil is 17.3 degrees (PDVSA 2007b, 13), making it heavy by international standards and therefore challenging to develop. Deposits in the Orinoco are extra-heavy and bituminous (USEIA 2006), requiring deep conversion refining because it is comparable in quality, but much more substantial in amount, to the coke residue from most refineries; estimates of the API gravity in these fields ranges from 16 to 32 degrees (PDVSA 2007b, 123). The Maracaibo fields are also very mature, demanding significant investment to maintain production (USEIA 2006). Fields in the Oriental basin, by contrast, are less mature than those that are farther west (USEIA 2006); however, these reserves are offshore. Improper

reactivation following the 2002-03 strike may have adversely affected fields throughout the country.

SOURCES CITED

- AES Corp. 2007, Feb. 27. United States Securities and Exchange Commission Form 8-K. http://idc.api.edgar-online.com/efx_dll/edgarpro.dll?FetchFilingConvPDF1?SessionID=OAYcCT9XohhDZsB&ID=4994410, last viewed on Sept. 23, 2007.
- Associated Press. 2007, Apr. 3. Venezuela's PDVSA Sells Record US\$7.5 Billion in Bonds.
- BBC. 2002a, Apr. 12. Oil Prices Falls as Chavez Quits. <http://news.bbc.co.uk/1/hi/business/1925330.stm>, last viewed on Oct. 5, 2007.
- _____. 2002b, Apr. 9. Venezuelan General Strike Extended. <http://news.bbc.co.uk/1/hi/world/americas/1918189.stm>, last viewed on Oct. 5, 2007.
- Boué, Juan Carlos. 1993. *The Political Economy of Oil*.
- BP. 2006. *Statistical Review of World Energy 2006*.
- Bradley, Teresa. 2007, Apr. 24. Chavez Vows to Seize Overpriced Health Care Providers. *Bloomberg*.
- Campbell, Oliver L. 2006, May 16. Impuesto de extracción—El mismo musiú con diferente cachimbo. *Petroleumworld*. <http://www.petroleumworld.com.ve/Napa051606.htm>.
- CITGO. 2007a. Company website. <http://www.citgo.com>, last viewed on Sept. 29, 2007.
- _____. 2006b, Apr. 8. CITGO Wraps Up 2006 Heating Oil Program. http://vocuspr.vocus.com/VocusPR30/Newsroom/Query.aspx?SiteName=Citgo&Entity=PRAsset&SF_PRAsset_PRAssetID_EQ=101231&XSL=PressRelease&Cache=True&SubMenu=Releases, last viewed on Nov. 11, 2007.
- _____. 2006c, Nov. 17. CITGO-Venezuela Heating Oil Program Makes 1st Delivery this Winter. http://vocuspr.vocus.com/VocusPR30/Newsroom/Query.aspx?SiteName=Citgo&Entity=PRAsset&SF_PRAsset_PRAssetID_EQ=101231&XSL=PressRelease&Cache=True&SubMenu=Releases, last viewed on Nov. 11, 2007.

- Compañía Anónima Nacional Teléfonos de Venezuela. 2007. "Somos Cantv."
<http://www.cantv.com.ve/seccion.asp?pid=1&sid=1243&id=2&und=6>, last viewed on September 23, 2007.
- Coronel, Gustavo. 1983. *The Nationalization of the Venezuelan Oil Industry: From Technocratic Success to Political Failure*.
- Cauclanis, Robert. 2007, Feb. Elaborate, Daunting Plans. *Petroleum Economist*, 27.
<http://www.petroleum-economist.com/default.asp?Page=5&ISS=23383>.
- Ecónanalítica. 2007a, March 9. PDVSA: Leading Company with Regard to Corporate Social Responsibility (Vol. 3, No. 8).
- Economides, Michael J., Anibal Martínez, & Silvia Puky. 2007, Jan 17. The History of PDVSA and Venezuela. *Energy Tribune*,
<http://www.energytribune.com/articles.cfm?aid=347>
- _____. 2007b, April. La paradoja de la abundancia en Venezuela. (Year 3, No. 3).
- Economist Intelligence Unit [EIU]. 2007a, Feb. 21. Venezuela: Education.
 El Universal. 2007, April 13. Legislature Rules Out Fuel Price Hike in the Short Term.
- Electricidad de Caracas. 2007a. <http://www.laedc.com.ve/>. Cached website, last viewed on www.google.com September 23, 2007.
- _____. 2007b. <http://www.laedc.com.ve/>. Current website, last viewed on September 23, 2007.
- Eller, Stacy, Peter Hartley, & Kenneth B. Medlock III. 2007. Empirical Evidence on the Operational Efficiency of National Oil Companies. http://www.rice.edu/energy/publications/docs/NOCs/Papers/NOC_Empirical.pdf, last viewed on Sept. 28, 2007.
- Ellner, Steve. 1998, Apr. 30. The Politics of Privatization. *NACLA Report on the Americas*. <http://www.hartford-hwp.com/archives/42/170.html>, last viewed on Oct. 5, 2007.
- Ellner, Steve & Daniel Hellinger. 2003. *Venezuelan Politics in the Chávez Era: Class, Polarization, and Conflict*.
- Ellsworth, Brian. 2007, Apr. 24. Venezuela Takeover May Harm Orinoco Oil Projects. *Reuters*.
- Embassy of the Bolivarian Republic of Venezuela. 2006, Oct. 31. Venezuela Energy Outlook. http://www.embavenez-us.org/fadi_oct31_2006.pdf.

- U.S. Energy Information Administration [EIA]. 2006a. A Primer on Gasoline Prices.
- _____. 2006. Venezuela Country Analysis Brief.
- _____. 2007. Weekly U.S. Retail Gasoline Prices, Regular Grade.
[http://www.eia.doe.gov/oil_gas/petroleum/
data_publications/wrgp/mogas_home_page.html](http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_home_page.html)
- Falola, Toyin & Ann Genova. 2005. *The Politics Of The Global Oil Industry: An Introduction*.
- Ferrell, Miranda. 2005 [no year given]. Venezuela: *Apertura Gas Natural?*
<http://www.beg.utexas.edu/energyecon/thinkcorner/Venezuela.pdf>, last viewed on Oct. 6, 2007.
- Forero, Juan. 2006, June 1. For Venezuela, A Treasure in Oil Sludge. *The New York Times*.
- Fox, Michael & Gregory Wilpert. 2006, May 15. International Energy Agency Increases Venezuela's Oil Production Estimates. *Venezuelanalysis.com*.
<http://www.venezuelanalysis.com/articles.php?artno=1729>.
- Frederick, Julia C. 2005. *The History of Venezuela*.
- Freshfields Bruckhaus Deringer. 2005, May. Venezuela: Proposed Measures Against Oil and Gas Investors. [http://www.freshfields.com/practice/finance/publications/
pdfs/11587.pdf](http://www.freshfields.com/practice/finance/publications/pdfs/11587.pdf)
- Harman, Danna. 2006, May 31. Venezuela's Oil Model: Is Production Rising or Falling? *The Christian Science Monitor*.
- Hinkle, Amy & M. Batzle. 2006, June. Heavy Oils: A Worldwide Overview, 742. *The Leading Edge*.
- International Energy Agency [IEA]. 2007, Mar. 13. Market Report.
<http://www.oilmarketreport.org>.
- Gallegos, Raul. 2007, Oct. 3. Venezuelan Congress Approves New Orinoco Oil Venture Deals. *Marketwatch*. [http://www.marketwatch.com/news/story/venezuelan-
congress-approves-new-orinoco/story.aspx?guid=%7B959649AE-0642-49E0-
A237-BBEB83B85C8B%7D](http://www.marketwatch.com/news/story/venezuelan-congress-approves-new-orinoco/story.aspx?guid=%7B959649AE-0642-49E0-A237-BBEB83B85C8B%7D), last viewed on Oct. 5, 2007.
- Goldman Sachs. 2006, Feb. Global Energy: 125 Projects to Change the World.
- Global Security. 2006. *Venezuela*, <http://www.globalsecurity.org/intell/ops/venezuela>.

htm.

- Kozloff, Nicholas. 2006. *Hugo Chávez: Oil, Politics, and the Challenge to the United States*.
- Latin American Data Base. 1996, Apr. 5. Venezuela: President Rafael Caldera Faces Mounting Protests Against Economic Measures. <http://ssdc.ucsd.edu/news/notisur/h96/notisur.19960405.html>, viewed on Oct. 5, 2007.
- Mares, David R. & Nelson Altamirano. 2007, March. Venezuela's PDVSA and World Energy Markets: Corporate Strategies and Political Factors Determining Its Behavior and Influence, http://www.rice.edu/energy/publications/docs/noc/Final%20PDFs/NOC_PDVSA_Mares-Altamirano.pdf.
- Markovits, Martin & Sebastian Kennedy. 2007, Sept. 27. Oiling the Wheels. *New Statesman*.
- Mather, Steven. 2006, Sept. 30. Joint Ventures: Venezuela's Faustian Pact with Foreign Capital. <http://www.venezuelanalysis.com/analysis/1980>, last viewed on Oct. 5, 2007.
- Melia, Michael. 2006, Jan. 30. Venezuelan oil marks Chavez's latest bid to win over U.S. *The Associated Press*.
- Millard, Peter. 2006, Apr. 9. Venezuela Min: Hawkish OPEC Stance To Continue After Vote. *The Wall Street Journal*.
- Ministerio del Poder Popular para Comunicación y la Información. 2007, Mar. 20. Capacitarán a vencedores de Misión Ribas en el área petrolera. http://www.minci.gov.ve/noticias-nacionales/1/12833/capacitaran_aencedores_de.html.
- _____. 2007b, June 20. Vicepresidente Rodríguez juramentó nueva directiva de la Electricidad de Caracas. http://www.mci.gov.ve/pagina/1/14420/vicepresidente_rodriguez_juramentnueva.html.
- Ministerio del Poder Popular para las Finanzas. 2007. La nueva economía venezolana: política económica-social y cambios estructurales.
- Mommer, Bernard. 2002, Nov. Subversive Oil, in Steve Ellner and Daniel Hellinger (eds.), *Venezuelan Politics in the Chávez Era: Polarization and Social Conflict*.
- Myers Jaffe, Amy. 2007, Mar. 1 & 12. Key Findings: The Changing Role of National Oil Companies (NOCs) in International Energy Markets. <http://www.rice.edu/energy/publications/docs/NOCs/Presentations/Hou-Jaffe-KeyFindings.pdf>.

OPEC. 2005. *Annual Statistical Bulletin 2005*.

Otis, John. 2007a, Mar. 6. Chávez Wants to Pass Saudis: Venezuela Out to Prove Its Oil Reserves Greater than Any Other, *Houston Chronicle*, <http://www.chron.com/disp/story.mpl/headline/biz/4605142.html>.

____. 2007b, May 5. Those Caught Up in Venezuelan Takeovers Make Adjustments. *Houston Chronicle*.

Pearson, Natalie Obiko. 2007, Mar. 27. Chávez's Largesse Puts Strain on Venezuela's State Oil Company as Exports to U.S. Decline. *Associated Press*.

Petroleos de Venezuela, S.A. [PDVSA]. 2006a, Jan. 30. Press Release, Venezuela Supports Bolivia's Position with Regard to Sovereignty over Its Reserves.

____. 2006b, Oct. 26. Press Release, Ramírez: We are searching for the mechanisms for the private sector's maximum participation in the Oil Sowing Plan.

____. 2006c, Nov. Contacto con la Nueva PDVSA:
Boletín Informativo sobre la industria petrolera venezolana (No. 8).

____. 2006d, Nov. 13. Press Release, PDVSA Obtains Certification for 45.5 Billion Oil Barrels.

____. 2007a, Jan. 10. Press Release, Chávez: We're Recovering the Largest Oil Reserve on the Planet.

____. 2007b. Información financiera 2006 y operativa 2005.

____. 2007c. Memoria y cuenta de Petróleos de Venezuela S.A.

____. 2007d. PDVSA website, <http://www.pdv.com>, last viewed on Feb. 16, 2007.

____. 2007e, Mar. 14. Press Release, Minister Ramirez Will Inaugurate Oil Intelligence Office in Vienna.

____. 2007f. Oil Sowing Plan 2005-2030. www.pdv.com, last viewed on April 14, 2007.

____. 2007g. PDVSA website. www.pdv.com, last viewed on September 23, 2007.

____, 2007h. Gestión y resultados.

Petroleum Intelligence Weekly. 2006, Dec. 18. Top 50 Rankings Based on Six Operational Criteria.

Pretel, Enrique Andres. 2007, Oct. 5. Venezuela Says to Hike State Oil Company Payroll.

- Reuters. <http://uk.reuters.com/article/oilRpt/idUKN0524063120071005>, last viewed on Oct. 5, 2007.
- Program on Energy and Sustainable Development [PESD]. 2007, Apr. NOC Study Prospectus.
- Ramírez, Rafael. 2006, Mar. 23. Speech given at the National Assembly about the Mixed Companies Model. <http://www.pdv.com>, last viewed on April 15, 2007.
- Reuters. 2007, Sept. 27. UPDATE 1-Venezuela says Orinoco oil output to rise in 2008. http://investing.reuters.co.uk/news/articleinvesting.aspx?type=oilRpt&storyID=2007-09-27T180721Z_01_N27385181_RTRIDST_0_OIL-VENEZUELA-OUTPUT-UPDATE-1.XML.
- Reyes, Gerardo. 2007, Mar. 29. Gasto estatal hunde a petrolera venezolana. *El Nuevo Herald*.
- Romero, Simon, & Clifford Krauss. 2007, April 10. In Venezuela, a Showdown Looms over Oil. *The New York Times*
- Rother, Larry. 2006, Dec. 7. Gas Smugglers Dodge the Law in Brazil and Venezuela. *The New York Times*.
- Tinker-Salas, Miguel. 2005, Winter. Fueling Concern: The Role of Oil in Venezuela. *Harvard International Law Review*.
- Turner, M. 2006, Dec. 20. What's In the Pipeline for South America. *KWR International*, Dec. 20, 2006. <http://kwrintl.com/library/2006/WhatsInThePipeline.htm>
- U.S. Energy Information Administration [USEIA]. 2006, Sept. Venezuela Country Analysis Brief.
- Upstream*. 2007, Mar. 28. PDVSA Talks Up Output Boost. [http://www.upstreamonline.com /live/article130190.ece](http://www.upstreamonline.com/live/article130190.ece).
- Weitzman, Hal. 2007, Mar. 7. ExxonMobil's Venezuelan finale plays out. *The Financial Times*.
- Weyland, Kurt. 2001, Nov./Dec. Will Chavez Lose His Luster? *Foreign Affairs*.
- Wilpert, Gregory & Sarah Wagner. 2005, June 29. Venezuela to Prove It Has World's Largest Oil Reserves. *Agencia Latinoamericana de Información y Análisis-dos*.
- Wilpert, Gregory. 2007, Feb. 9. Venezuela and Electric Company Sign Memorandum for Nationalization. *Venezuelanalysis.com*. <http://www.venezuelanalysis.com/news.php?newsno=2214>

