

Regulatory Frameworks:

Efficient State-owned Oil & Gas Enterprises

Lessons Learned



Canadian International
Development Agency



UNIVERSITY OF
CALGARY

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OLADE

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**REGULATORY FRAMEWORKS:
Efficient State-Owned Oil & Gas Enterprises**

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Index

Index of Figures	05
Index of Tables	05
Acronyms	06
Executive Summary	07
INTRODUCTION	12
1. THEORETICAL ASPECTS	14
1.1 The Theoretical Approach	14
1.2 The Practice	17
1.3 State-owned enterprise Design: Should it be different?	20
1.4 Brief Discussion of Nationalization	22
1.5 Good Practices	23
2. CASE STUDIES	26
2.1 PETROBRAS S.A. - Brasil	26
2.1.1 Market Characteristics	27
2.1.2 Organization	28
2.1.3 Plans and Projects	31
2.2 Empresa Nacional de Petróleo (ENAP) - Chile	32
2.2.1 Market Characteristics	33
2.2.2 Organization	33
2.2.3 Plans and Projects	34
2.3 ECOPETROL – Colombia	34
2.3.1 Market Characteristics	35
2.3.2 Organization	35
2.3.3 Plans and Projects	36
2.4 Refinadora Costarricense de Petróleo (RECOPE) - Costa Rica	37
2.4.1 Market Characteristics	37
2.4.2 Organization	38
2.4.3 Plans and Projects	38
2.5 Petróleos del Perú S.A. (PETROPERÚ) - Perú	39
2.5.1 Market Characteristics	40
2.5.2 Organization	41
2.5.3 Plans and Projects	42

2.6	Administración Nacional de Combustibles, Alcohol y Portland (ANCAP) – Uruguay	43
2.6.1	Market Characteristics	43
2.6.2	Organization	44
2.6.3	Plans and Projects	45
2.7	Good Practices	46
3.	COMPARATIVE ANALYSIS	49
3.1	The Theoretical Model	50
3.1.1	Assumptions and Specifications	50
3.1.2	Numerical Outcomes	52
3.1.3	Possible Solution	58
3.1.4	The producers companies	58
3.1.5	Some Considerations	61
3.2	Empirical Analysis	62
3.2.1	Large-scale Producers - Group 1	63
3.2.2	Medium-size Producers - Group 2	63
3.2.3	Refiners and Importers - Group 3	64
3.2.4	Comparative Results	65
3.2.5	Conclusions of Empirical Analysis	70
4.	CONCLUSIONS	72
	BIBLIOGRAPHY	78
	Annex 1 - Financial Data - Group 1	81
	Annex 2 - Financial Data - Group 2	82
	Annex 3 - Financial Data - Group 3	83



Index of Figures

Figure 1:	Makeup of Ordinary Shares - July 2008	29
Figure 2:	Makeup of Capital Stock - July 2008	29
Figure 3:	Share Makeup of ECOPETROL (April, 28 2008)	36
Figure 4:	Particular Case - Constant Prices	53
Figure 5:	Particular Case - Rising Prices	54
Figure 6:	Particular Case - Falling Prices	55
Figure 7:	General Case - Constant Prices	56
Figure 8:	General Case - Rising Prices	57
Figure 9:	Producers Companies - High Sales Prices	60
Figure 10:	Producers Companies - Low Sales Prices	60
Figure 11:	Gross Revenues of Large-scale Companies	63
Figure 12:	Gross Revenues of Medium-size Companies	64
Figure 13:	Gross Income of Importing and Refining Companies	65
Figure 14:	Comparative Analysis	66
Figure 15:	Average Earnings after Taxes - Group 1	66
Figure 16:	Average Earnings after Taxes - Group 2	67
Figure 17:	Transfers from the State-owned enterprise and WTI Prices - Group 1	68
Figure 18:	Transfers from the State-owned enterprise and WTI Prices - Group 2	68
Figure 19:	Average Earnings after Taxes - Group 3	69
Figure 20:	Transfers from the State-owned enterprise and WTI Prices - Group 3	70

Index of Tables

Table 1:	Plans and Strategies - Institutional Relationship	32
Table 2:	PETROPERU's Participation in the Oil & Gas Market (2008)	40

Acronyms

ANCAP	Administración Nacional de Combustibles, Alcohol y Portland - Uruguay.
ANH	Agencia Nacional de Hidrocarburos (ANH) - Brasil.
ARESEP	Autoridad Reguladora de los Servicios Públicos - Costa Rica.
CGR	Contraloría General de la República.
CNE	Comisión Nacional de Energía - Chile.
ECOPETROL	The State oil company of Colombia.
ENAP	Compañía Nacional del Petróleo - Chile.
FONAFE	Fondo Nacional de Financiamiento de la Actividad Empresarial del Estado.
GLP	Liquefied Petroleum Gas.
MIEM	Ministry of Industry, Energy and Mining - Uruguay.
NGC	National Gas Company - Trinidad y Tobago.
OSINERGMIN	Organismo Supervisor de la Inversión en Energía y Minería - Perú.
PDVSA	Petróleos de Venezuela S.A. - Venezuela.
PEMEX	Petróleos Mexicanos - México.
PETROBRAS	Petróleo Brasileiro S.A. - Brasil.
PETROECUADOR	Petróleos del Ecuador - Ecuador.
PETROPAR	Petróleos Paraguayos - Paraguay.
PETROPERÚ	Petróleos del Perú S.A. - Perú.
PCJ	Petroleum Corporation of Jamaica - Jamaica.
RECOPE	Refinadora Costarricense de Petróleo S.A. - Costa Rica.
STAATSOILE	Staatsolie Maatschappij Suriname N.V. - Suriname.
WTI	West Texas Intermediate.
YPFB	Reservorios Petrolíferos Fiscales Bolivianos - Bolivia.

Executive Summary

The review presented in this paper is part of the Sustainable Energy Program developed jointly by the Latin American Energy Organization (OLADE) and the University of Calgary, with funding from the Canadian Government through the Canadian International Development Agency. The purpose for this project is to review the regulatory framework of the State energy company milieu and more specifically the oil and gas sector, and to document the lessons learned to make it useful to all the member countries.

Seeking to contribute to discussions on this topic, this paper reviews the “good practices” observed in some Latin American and Caribbean State-owned enterprises, and offers a comparative analysis in an attempt to identify indicators that could affect their performance. This project began with six case studies performed by international consultants hired by OLADE in 2007 as part of the project mentioned in the first paragraph.

One of the central debates in a country’s oil and gas sector is whether or not should be a State-owned enterprise that controls all or most of the value chain. This debate was revitalized over the past years because many Latin American and Caribbean countries decided to “re-launch” their State oil & natural gas companies due, among other things, to the remarkable growth in international crude oil prices.

As a result of an bibliographic review of State-owned enterprise performance and assessment, a few “Good Practices” were identified from experiences observed in some countries or theoretical assessments made by the authors. The most significant ones are presented below:

- It is not wrong for a State-owned enterprise to have multiple goals, but when their prioritization is confused, business management becomes difficult. Therefore, it is necessary for both the State and the State-owned enterprise to be clear regarding the company’s central goal.
- The usual business performance indicators (high profits, for example) should not be the only measures taken into account, as State-owned enterprises often must reach equity goals.

- A system that separates the company from direct involvement of politics and parties will improve its performance. On the other hand, a motivation system with manager performance evaluations offers the incentives needed to improve company efficiency. Part of the reviewed bibliography concurs that one of the most effective ways to enhance company performance is to bring in private sector representatives.
- According to some authors, State-owned enterprise economic and financial corporatization is a policy that is necessary, but not sufficient, to prevent the interference of party politics. In fact, this should be the first step to enhancing company efficiency.
- State-owned enterprise performance improves when the State does not cover company debts, thereby encouraging a certain financial discipline.
- Whenever possible, increase competition in sectors in which the private sector participates.
- Often the Government uses State-owned enterprises to solve problems that, in principle, are not their responsibility. In this regard, designing other types of solutions for these problems may lower its budget. Although currently the concept of “social responsibility” is important for both public and private companies, this should be limited.
- The Central Government can improve State-owned enterprise performance by designing a legal framework that: a) makes it possible for part of the shares to be sold to the private sector; b) applies budgetary disciplines; c) prevents complex monitoring methods; and d) establishes internationally accepted business criteria.

In 2007, OLADE contracted out six case studies among external consultants, who were to study the following companies: PETROBRAS, ENAP, RECOPE, ANCAP, PETROPERU, and ECOPETROL. Then in 2008, the author interviewed representatives of the companies under study, to expand and complete the information available in the case studies and hear the opinions of company members on the project. Below are the “Good Practices” identified in those case studies, from the consultants’ work and the author’s interviews.



- In each of the six case studies, the State-owned enterprise has a dominant market position, either because it is ensured through the applicable law or because these companies, although facing competition, have remained market leaders. However, greater flexibility and autonomy is seen the decisions made by companies having competition. Comparing this review with the empirical one in the third section, we find companies with good efficiency indicators acting in markets where competition is allowed.
- For greater flexibility in company management it should have a share package, even if 100 % of the shares belong to the State. However, if there are legal norms that go against granting the company greater flexibility, it helps very little to have a share package.
- It is common to find medium and long-term expansion and investment plans approved jointly by the Treasury Department and the Ministry of Energy. However, there is a fair amount of flexibility when executing annual plans. In fact, some companies have complete independence in designing them.
- It seems very useful for Central Governments to participate in developing State-owned enterprise plans and projects, sometimes in their capacity as partners. In this way, final approval at a more formal level does not face as many objections from the Government itself.
- There are cases where companies give bonuses (to their personnel) when meeting qualitative and quantitative goals, which helps solve the agency problem.* The same applies to the labour stability generated, in the case studies, by a suitable work environment that enhances worker performance and, perhaps more importantly, ensures that medium and long term plans are implemented.

Some companies have solved the control problems by promoting worker participation in collective negotiation of work-

* This problem refers to the fact that often staff goals are not the same as company goals

ing conditions. In this way, salary raises or training policies are decided on following an evaluation process.

- In oil importing countries, the State-owned enterprise generally takes care of refining and distributing oil products. Therefore, when prices are on the rise it is good to keep fluid communication and coordination between the Treasury Department, the price regulatory agency and the State-owned enterprise. In this way, domestic oil product price adjustments harm neither company finances nor tax collection.
- In countries with crude oil import companies, it seems to be a good practice for the regulating entity to evaluate the State-owned enterprise operating and capital costs with each domestic oil product price readjustment, in order to check whether early adjustments were utilized correctly.

The last section of this paper offers an econometric analysis** with companies that have information available for 2000-2007. State-owned enterprises were divided into three groups according to their production and commercialization characteristics: 1) Group 1, made up of PETROBRAS (Brazil), PEMEX (Mexico) and PDVSA (Venezuela), including large-scale production and refining companies; 2) Group 2, with PETROECUADOR (Ecuador), ECOPETROL (Colombia) and NGC (Trinidad & Tobago), are smaller-scale production and refining companies; and 3) Group 3, with PETROPERU (Peru), RECOPE (Costa Rica), ENAP (Chile) and ANCAP (Uruguay), which are importing and/or refining companies.

- Comparing the behaviour of each group with the weighted average of the “Earnings before Taxes / Gross Revenues” indicator, we see that Group 2 has higher figures than Group 1, which is consistent with diseconomies of scale. According to this concept, the larger the size of the company, the lower its performance will be. On the other hand, in the Group 3 we see a drop in this indicator maybe due to the rise in international oil prices.

** Semi-parametric models using density-type kernel functions and bootstrapping methods to evaluate the standard error of estimated coefficients.

- The earnings after taxes indicator seems to confirm the hypothesis made with the theoretical model: 1) when oil & gas sales prices rise, the Government has every incentive to increase transfers from the State-owned enterprise; and 2) when the Government privileges supplying the domestic market, Government participation in the sector relaxes.
- Certainly the “earnings before taxes” indicator is a possibility among a broad set of alternatives. In this regard, the findings are merely indicative and should be subject to several additional essays and tests. However, these findings support the idea of that State-owned enterprise performance is linked to the Central Government’s behaviour in each country.

Evidently the results obtained for some State-owned enterprises are not good from a financial point of view; however, this analysis did not consider the social investment carry out by these companies. In fact, since they are state companies, it is not evident that the comparative analysis should be financial, future investigation can be concentrate on the construction of an efficiency indicator for a State-owned enterprise.

Because of the above, is very difficult find a single model of an efficient company, since the success of a State-owned enterprise depends on the unique characteristics of the country, its markets, prices, reserves, and others. Therefore, a State-owned enterprise could take into account what other countries did based on their reality, but it is not trivial task to analyze a country’s particular characteristics to build a “tailor made” State-owned enterprise.

Finally, good State-owned enterprise performance also results from factors that often escape the company’s control. Therefore, not only is adequate management within the company necessary, but the Central Government should also keep in mind that this production unit needs to cover its operating and capital costs. Finally, it is necessary for the Central Government to respect its agreements with the State-owned enterprise, just as it would just as it would with a private company.

Introduction

This document is part of the Sustainable Energy Program that the Latin American Energy Organization (OLADE) is developing jointly with the University of Calgary and funding from the Canadian Government through the Canadian International Development Agency. The purpose for this project is to review the regulatory framework for State energy company, particularly in the oil & gas sector, and document the lessons learned so that it will be useful to all Member countries.

Seeking to contribute to discussions on this topic, this document explores the “good practices” observed in some State-owned enterprises and offers a comparative analysis between them, in order to find criteria, whether shared or not, that could influence their performance. This project began with six case studies developed by international consultants contracted by OLADE in 2007 as part of the project mentioned in the first paragraph.

Perhaps one of the main debates in the oil & gas sector of a country is whether or not a State-owned enterprise should control all or most of the value chain. This debate was revitalized in the past few years because many countries of Latin America and the Caribbean decided to “re-launch” their State oil and natural gas companies due, among other factors, to the notable rise in international crude oil prices.

One of the main conclusions of this work refers to the link between State-owned enterprises and Governments. It strongly suggests the hypothesis that State-owned enterprise efficiency or performance depends not only on internal or managerial decisions, but also on a governmental decision to give this company the “right” treatment. Said another way, to have a good State-owned enterprise, efficiency is an essential precondition, but is not enough. Also needed is the Government’s political commitment to grant the State-owned enterprise fair, balanced treatment. Of course, this “fair, balanced” treatment refers mostly to the tax contributions that the State-owned enterprise makes to the Central Government.

This paper is organized as follows: the first section studies theoretical aspects of State participation in production activities. Then we present the primary findings of the case studies performed. The third section presents a model summarizing the relationship between the State and



State-owned enterprises, and then a few comparative indicators are reviewed among State-owned enterprises in the region. Finally, the findings of this work are presented.

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1 Theoretical Aspects

The debate on State intervention in economic activities it is not new and is certainly far from over. Should the State be dedicated to productive activities? Should the State only provide education and health services? Which public goods should be provided by the State? These are questions that are often asked in the academic and political debate, and of course the answers will depend on the ideological balance of each proponent.

The focus of this work, however, is not to answer these questions. On the contrary, it starts with the fact that many countries decided, for various reasons, to have State-owned enterprises in charge of the oil & gas value chain. Therefore, although there is some critical literature regarding whether or not there should be State-owned enterprises, the final purpose is to summarize the “good practices” found in the bibliographical review for this section.

The focus of this analysis differs from the norm, since the literature tends to analyze State-owned enterprises with serious problems, see Chang (2007). On the contrary, the central objective of this paper is to study the positive characteristics of State-owned enterprises, in an attempt to build a propositional analytic framework.

This section begins point out the theoretical aspects that would justify the existence of State-owned enterprises. Then it reviews the empirical evidence on their functioning, with some emphasis on the management issues found. The third section discusses which criteria should be used to assess a State-owned enterprise. In particular, it is necessary to ask whether State-owned enterprises should have social objectives or not. The next section offers a brief overview of the factors that would cause nationalization of State-owned enterprises and that revitalized the discussion on State-owned enterprises. Finally, we review the usual recommendations to enhance State-owned enterprise performance.

1.1 The Theoretical Approach

Assume that the Government wants to provide some good or service to



a group of consumers. Should it contract persons to deliver this service or should it delegate this provision to the private sector (probably regulated)? In this way, Schleifer (1998a and 1998b) begins the discussion of the theoretical reasons that would lead States to provide a given good or service. A good summary of this is found in Chang (2007):¹

1. Natural Monopolies:² It is preferable to have a public one than a private one, even when the latter is correctly regulated.³ However, according to Schleifer (1998a and 1998b) for public provision to be better than private provision, the following assumptions should be carried out: 1) decreasing service quality means a major saving in costs, so if service provision is relegated to the private sector, it has every incentive to lower its quality; 2) innovating it is not important, otherwise the private sector could improve the service innovating it; and 3) the company's reputation it is not important, so the private sector would have no incentive to invest to improve the service it provides.⁴
2. Flaws in the capital market. The private sector would not invest in high risk industries and/or long term projects, so State intervention is desirable.
3. Externalities. The private sector does not want to invest in activities that could benefit other industries without receiving remuneration in exchange.
4. Equity. Companies that only seek to maximize profits may not want to offer services/products to people who are poor or live in remote areas.

¹ All these reasons are based on the assumption of a "benevolent government" that wants to maximize the people's wellbeing, see Schleifer (1998a and 1998b)..

² A natural monopoly is a market situation in which it is less costly, socially, to have a single company that provides the good or service.

³ The debate on this topic is far from over.

⁴ Not all are present only in natural monopolies.

⁵ A criterion that is also given in Schleifer (1998a) and Schleifer (1998b)..

⁶ A complete contract is a theoretical figure that means a contract that anticipates all possible circumstances.

According to Chang (2007), all of these objectives could be met by the private sector,⁵ but it would require designing, implementing and managing complete contracts⁶ at a considerable cost. In this regard, if the most feasible thing is to establish incomplete contracts, Salehi & Toossi (2002) study the conditions that justify a State-owned enterprise in two situations: a) when the regulatory design and tax system make it prohibitive for the private sector to participate; and b) when the State wants the State-owned enterprise to carry out other types of tasks. The authors find, on both a theoretical and empirical level, that State-owned enterprises generate stable balances when:

- a) The cost of inefficiency due to greater employment is low;
- b) The cost of commitment to the private sector, to keep the rules of the game stable, is high; and
- c) The political pressure for jobs is high.

Hartley & Medlock (2008) also summarize a few aspects that would theoretically justify the presence of a State-owned enterprise: a) if the State does not take charge of the activity it could be done by the private sector, with the risk of becoming a large-scale private monopoly; b) the public goods associated with the company activity (roads, ports, etc.) could be developed by a State-owned enterprise and not a private one; and c) when taxes and royalties are paid by the State-owned enterprise, then the costs associated to redistribution policies can be lowered.

Bennett & The Manna (2003) analyze State-owned enterprise interactions with private firms in an oligopoly market. They say that when the cost differential it is not large between State and private companies, the balance in a private oligopoly market is equal to the balance in a mixed market where the State-owned enterprise and private companies coexist. The central assumption in this analysis is that the State-owned enterprise has a privileged position in the market because the threat of producing lower than optimum quantity⁷ is credible. Although the findings given in this paper are theoretical and very preliminary, they are interesting and open a path of research. Matsumura (1998) shows that in a duopoly with a mixed company and a private one, it is not optimal for the State to have 100 % of all shares in the mixed company.

⁷ Where se maximize the benefit.



1.2 The Practice

In the above section we reviewed the operating conditions of a State-owned enterprise when the Government is benevolent, i.e., maximizes social wellbeing. However, Schleifer (1998a and 1998b) conclude that in most cases this is not the case. State-owned enterprises are inefficient because Governments deliberately transfer resources to persons or institutions that helped (or are helping) them reach (or remain in) power,⁸ or they look after their own revenues, thereby generating corruption. This is how what the theory suggests begins to move away from the empirical evidence.

With regard to State-owned enterprise efficiency, Shirley & Walsh (2000) study whether it is market conditions or company ownership (public or private) that condition its efficiency. According to these authors, part of the literature sustains that even when the market is competitive it will not cause the State-owned enterprise to be more efficient, due to the interference of party politics. On the other hand, other literature says that if there is competition in the market, then companies tend to be efficient, whether public or private. The authors conclude that there is more empirical evidence and theoretical grounding for the first hypothesis, and that even where competitive market conditions do exist, if the interference of party politics is high,⁹ then State-owned enterprises will most probably be inefficient.¹⁰

Bennedsen (1998 and 1999) ask why State ownership affects company efficiency or, in other words, why transferring ownership to the private sector “de-politicizes” the firm’s business management? “De-politicizing” is understood as eliminating the interference of party politics in a company’s managerial decisions. From a theoretical perspective, the author shows that the lobbying possibilities of certain interest groups decreases when companies are privately managed, since these groups lose their ability to influence agencies involved in party politics. This reduction in lobbying to land jobs or receive State subsidies would generate greater efficiency in privately managed companies. Of course, this document

⁸ For example, paying higher salaries, employing more people or producing goods and services according to politicians’ needs, see Shleifer & Vishny (1994)..

⁹ With the necessary instruments.

¹⁰ Also see Hartley & Medlock (2008).

does not go into the conflicts of interest generated when the private sector also does the lobbying needed to enter and remain in the market.

Shleifer (1998b) suggests that State-owned enterprises would have less incentive than private companies to make investments that lower costs and/or enhance service quality, because the company's managers¹¹ are not its owners and so receive only part of the return on this additional investment. The author also says that private provision does not result in better quality in all cases, e.g., the wish to maximize private earnings could cause a drop in quality. In these cases, State provision causes better quality precisely because employees do not have the incentive to lower costs. Nevertheless, according to the author, the private sector wish to innovate, within a competitive framework,¹² would offset this quality problem.

In a case study by Norway, Kashani (2005) shows that State interference in production activities generated productive inefficiency, because many of the inputs used by private companies are less expensive than those used by the States, since States privilege domestic supplies.

Shirley & Walsh (2000) found that political parties will use State-owned enterprises to their own benefit when the following conditions are forthcoming:

- The less competition there is between political parties (to reach power) the greater their ability to interfere with company performance.
- When State-owned enterprise budgets and regulations can be easily manipulated and are not subject to control by an independent entity.
- When managerial positions depend on the Executive Branch, for example, it is easier for political parties to manipulate State-owned enterprise decisions to their own benefit.

¹¹ Managers.

¹² No bajo condiciones monopólicas.



- When corruption is a common practice and is not penalized.
- When market conditions are favourable, society may tolerate certain levels of State-owned enterprise inefficiency, as they are not evident to end consumers. This favours the intervention of party politics in a State-owned enterprise's managerial decisions.

On the other hand, Sappington & Sidak (2003) claim that State-owned enterprises attempt to maximize a combination of revenues and benefits for the company, with income being a proxy for the scale of the operation. In this way, a State-owned enterprise would elect optimal prices¹³ below marginal production costs. This in turn would lead to anti-competition practices by the State-owned enterprise, resulting in three types of inefficiency: allocations, production and dynamic (less investment by other private firms). In a similar analysis, Whalley & Zhang (2006) create a theoretical model where they show that when a State-owned enterprise maximizes the size of its operation, it tends to contract more labor than the optimum.¹⁴

One of the more serious criticisms raised against State-owned enterprises is that they lead to greater corruption. In this regard, Clarke & Colin (2001) verified that in the case of State utility companies, this hypothesis does hold. Of the transmission channels that the authors found, two call one's attention: 1) Corruption actually appears due to an excess of demand for the service, so companies with little installed capacity and low supply (generally State-owned) result in corruption, and of course the presence of an external agent is also necessary to bring about this corruption; 2) When a company is State-owned there is no managerial incentive to reduce corruption, as there is no additional pay for it.

Among the positive aspects generated by State-owned enterprises we can find a study done by Karayalcin & Ali Ulubasoglu (2004), which analyzes the impact of State-owned enterprises on income redistribution. The authors indicate that the salaries paid by State-owned enterprises above worker productivity, and the excessive work load, are due

¹³ Para lograr mayores ingresos y/o producción.

¹⁴ La óptima es la que maximiza el beneficio de la empresa, no así el ingreso o la producción.

to a policy of redistribution to the population, more than to the business type. Through an econometric model they found a positive relationship, for a sample of countries, between economic inequality and State-owned enterprise size, which was a very preliminary confirmation of the initial hypothesis that the presence of State-owned enterprises improves income distribution.

1.3 State-owned enterprise Design: Should it be different?

As seen in the above section, efficiency is one of the most important variables for comparing public and private provision. However, some literature says it is unfair compare public and private companies with common or similar indicators, as they have inherently different objectives.

Bhattacharyya (2005) has a fairly critical vision of State-owned enterprise business assessment.¹⁵ This author says that some State-owned enterprises should not have merely commercial objectives because their mission is “to generate positive externalities”, e.g., in the case of energy, to ensure the region’s supply. In this regard, he proposes the following rules of thumb that should guide the actions of a State-owned enterprise:

- a. There should be only one goal for each State strategy, since often the objectives that generate “positive externalities” go against those that only seek to maximize company profits. Therefore, the performance of a given company should not be measured with the usual indicators of profit maximization, but its assessment should be based on its initial goal.
- b. State-owned enterprises should have commercial and managerial autonomy, which means isolating the company’s operational performance from the interference of party politics.
- c. Each State-owned enterprise should have a business plan for the following five years, which should be agreed upon with the Central Government through a Memorandum of Understanding, so that each of the parties will comply with what was

¹⁵ Where the company’s central objective is maximizing profits.



agreed to. Along this line, Vagliasindi (2008) studied examples of countries that implemented organizational development agreements and individual development agreements between the top company executives and members of the Government. This author sees more problems than benefits in this type of agreement, as they tend to be continually renegotiated because of the unrealistic objectives that are initially introduced.

- d. On the board of directors, the Government should have some but not all of the seats. This makes it possible to articulate Government policies with business ones,¹⁶ but leaves some space for the company to make its own operational decisions.

Vagliasindi (2008) touches upon the aforementioned topics, but in a more orderly fashion. This author identifies three general types of organization; a) centralized, where decisions respond to State policies; b) decentralized, where decisions are made according to the State-owned enterprise characteristics; and c) mixed, i.e., a mixture of the former two. According to this work, is very difficult to recommend on type of organization for developing countries. In general, their success depends of the objectives, first of the State and then of the State-owned enterprise.

Even under the assumption that the goals of a State-owned enterprise should not be the same as those of a private company, the agency problem persists¹⁷ because company manager performance is not as the owners would like.¹⁸ In this regard, Shirley & Walsh (2000) present the agency problems of a State-owned enterprise that would favor private presence:

- **Monitoring.** Considering that the tax payers own a State-owned enterprise, then the ability to assess its performance is very poor, since often there are no comparative criteria to evaluate the company and it has been empirically shown that the more owners the less control over managers.¹⁹ Therefore, in the private sector, owners would be better able to control their managers' performance.

¹⁶ In addition to controlling management.

¹⁷ Chang (2007) and Vagliasindi (2008).

¹⁸ Technically, this is a principal agent problem.

¹⁹ Problem of free rider, Chang (2007).

- **Contracts.** The private sector is better able to enter into contracts between company owners and managers, to ensure that the latter do their jobs conscientiously. According to Shirley & Walsh (2000), this capacity decreases in the State sector.
- **Takeovers.** The concentration private company shares in a single shareholder could improve the control systems that company. This is not possible in a State-owned enterprise, because shares cannot be sold.²⁰
- **Bankruptcy.** Finally, a private company can become bankrupt due to mismanagement. This is not usually seen in the State sector, because a public company, for example, can receive continual subsidies if the political cost of doing so is less than that of closing the company.

1.4 Brief Discussion of Nationalization

In light of the growing trend to nationalize oil & gas companies, Guriev et al. (2008) study the determining factors for oil nationalizations throughout the world. These authors start out by asking a question. Given that nationalizations are seen when oil prices are high, why do some States decide to nationalize instead of raising taxes? Increased taxation maintains their contractual relationships with companies (creating investment incentives) and expands their share in the oil revenues.

In the theoretical model, using game theory, the authors find a stable balance for non-expropriation and a high investment level when: a) oil prices are low; b) expropriation costs are high; c) the agents are patient; and d) the Government is inefficient enough when investing in production. On the other hand, we see a equilibrium of expropriation and Low Level of Investment when prices are high and very volatile.

Using a panel data model, the authors find that the probability of expropriation rises when: a) international oil prices are high; and b) the

²⁰ The case extremo is the privatization of the company.



country's institutional development is low. Although the authors do not rule out that some of these relations may be spurious, these findings are coherent with other literature reviewed in this paper.

Similar criteria are shared in Reynolds & Kolodziej (2007) and Locatelli (2006), which mention that changes in institutions, for example with nationalization, may negatively affect oil supply growth. In particular, the Russian oil & gas sector's response to the institutional changes of the past years²¹ could affect the world oil supply. Of course, this paper does not analyze the performance of the middle eastern State-owned enterprises.

1.5 Good Practices

From a more propositional standpoint, Vagliasindi (2008), Muir & Saba (1995) and Chang (2007), based on observed experience, propose some measures that could improve State-owned enterprise performance. Following Muir & Saba (1995), below we group these measures according to the internal and external factors that would enhance that performance.

Internal Factors

- **Organizational Reforms.** Chang (2007) does not find it to be wrong for State-owned enterprises to have multiple purposes, but if their priorities are not clear, then business management becomes difficult. Therefore, it is necessary have a clear central purpose for the company.

Anderson et al. (1999) show that, in the case of Mongolia, State-owned enterprise performance was better than that of private companies, because tasks were simple and private owners were not favoured by the institutional setting. On the other hand, Muir & Saba (1995) consider that a transparent separation in accounting between the business and social goals may enhance State-owned enterprise performance. For

²¹ Tending towards greater State participation.

example, it is good to correctly quantify the costs and benefits of equity policies (for example, subsidies) and compensate the State-owned enterprise for the cost to meet this goal.

- **Performance Monitoring and Evaluation.** The usual business performance indicators (high profits, for example) should not be the only measures considered, because State-owned enterprises need to reach equity objectives. In this regard, interesting alternatives arise such as: a) contrasting market prices with shadow prices; b) not evaluating performance as levels but as trends; c) evaluating variables that do depend on executives (quality, product, etc.) and not those over which they have little influence, generally linked to regulatory aspects; and d) benchmarking policies could help assess business performance.
- **Agency Problems.** Muir & Saba (1995) say that a system that separates the company from State interference is positive for public company performance. On the other hand, a system of rewards and punishments to evaluate manager performance creates the incentives needed to improve company efficiency. Finally, one of the most effective ways to improve company performance is to include private sector representatives.

As a corollary, Muir & Saba (1995) also mention that the creation of business holdings presents the following problems: a) it generates excessive bureaucracy; b) it hinders the creation of “protective shields” against the interference of party politics; c) there is a tendency towards crossed subsidies within the holding; and d) there is no way to control the growth of these corporate forms once established. Therefore, these authors recommend avoiding the creation of this type of structures.

- **Improve Financial Discipline.** State-owned enterprise performance improves greatly when the State does not cover the unpaid debts of that company, thereby inducing a certain financial discipline.

²² See Gomez-Ibanez (2007) and Irwin & Yamamoto (2004), in Vagliasindi (2008).



- Vagliasindi (2008) states that one policy that is necessary, but not sufficient, to prevent the interference of party politics, is the corporatization of the State-owned enterprise.²² In fact, the author says that this should be the first step towards improving company efficiency.

Factores Externos

- Increase Competition. Obviously this measure cannot be implemented in the usual way in the case of natural monopolies, but it is possible in sectors where the private sector intervenes.
- Political and Administrative Reforms. Often Governments use State-owned enterprises to solve problems that initially did not belong to those State-owned enterprises. Therefore, designing other types of solutions for these problems could help lower State-owned enterprise budgets.
- It is desirable for a single governmental institution to be the one controlling the State-owned enterprise. Muir & Saba (1995) say that independent external auditors should be the ones doing this work.
- The Central Government can improve State-owned enterprise performance by designing a legal framework that: a) makes it possible to sell some of its shares to the private sector; b) applies budgetary restrictions; c) avoids complex monitoring methods; and d) establishes internationally accepted business criteria.

2 Case Studies

In 2007, OLADE contracted out six case studies among external consultants, who were to study the following companies: PETROBRAS, ENAP, RECOPE, ANCAP, PETROPERU and ECOPETROL. The goal of each of these studies was to find the “Good Practices” that might be reproduced in other countries. The finales papers from each are available on OLADE’s Web page: www.olade.org.ec.

This paper is an attempt to highlight the “Good Practices” identified in the above case studies. To avoid this being merely a summary of these documents, during 2008 the author interviewed representatives of the companies under study. The purpose for these meetings was to expand and complete the information available in the case studies, hear the opinion of the company on this project and gather the information used in the respective comparative and quantitative analysis.

Accordingly, this section presents the main findings of the case studies and the work done by the author directly with the State-owned enterprises. This section is not an attempt to fully describe the performance of each company, as this is found in each case study. Rather, our main purpose is to collect and group the good practices that the author believes could be taken into account by other State-owned enterprises.

Each of the companies is reviewed in the following order. First, we present the market characteristics where each one operates. Then there is a theoretical reflection on the relationship between market competition and company efficiency. It is good to know whether or not these companies have a monopoly on oil & gas activities. The second part describes the business characteristics, e.g., shareholding, organizational charts, and others. This section attempts to show how the Central Government relates to the State-owned enterprise. Finally, the third section studies the process by which the companies under review carry out their investment plans and programs. In particular, we wish to know the degree of flexibility and autonomy that each company has to further these endeavours.

2.1 PETROBRAS S.A. - Brazil

Petroleo Brasileiro S.A. (PETROBRAS) is the oil & gas State-owned enterprise of Brazil, established in October 1953 by Law No. 2004. From its

creation until 1998, PETROBRAS had the monopoly over most of the activities in the hydrocarbons production chain, except for retail and wholesale distribution. Later, as of 1999 under the new regulatory framework, it stopped having the exclusive monopoly, and a model was created under which the State-owned enterprise competes with the private sector.

2.1.1 Market Characteristics

The reforms of the nineties in Brazil promoted private participation in the oil & gas industry, especially in the areas of exploration and exploitation. However, the premise of keeping PETROBRAS as the lead company in the market prevailed.

Until the mid nineties, PETROBRAS had a monopoly over the different stages of the production chain in the oil & gas sector.²³ With Constitutional Amendment No. 09 / 95 and the new Petroleum Act (No. 9478) the Brazilian market was opened to private participation. For this purpose, the Brazilian State created the Agência Nacional del Petróleo (ANP) to “promote the regulation, contracting and supervision of economic activities making up the oil industry”.²⁴ Therefore, this agency is responsible to regulate all operating agents, including PETROBRAS, in the Brazilian oil & natural gas market.

One of the most important tasks that the ANP has is drawing up concession contracts for exploration and production in areas of oil & gas interest. In fact, during the first seven rounds of block tendering (until 2006), over 500 exploration blocks were licensed, which helped new operators enter the exploration and production business.²⁵ However, PETROBRAS remains as the lead company in this business,²⁶ despite the fact that it has to compete with the rest of the private actors, since the market is open to competition.

²³ See Campodónico (2007.a).

²⁴ Law No. 9478, article 8°.

²⁵ Pinto (2007) says that these reforms enabled greater investment and, therefore, the reserves / production indicators should improve.

²⁶ Pinto (2007) says that it is also seen in the areas of refining and transportation and, on a smaller scale, in commercialization. Regarding natural gas production and importing, Petrobrás is responsible for more than 90 % of the total.

In the interview with PETROBRAS personnel, they mentioned two factors that have most contributed to the company's success in past years: 1) designing an appropriate regulation system; and 2) the company technological development, particularly, oil & gas exploration and exploitation in "deep waters".

Regarding the first point, a suitable regulatory framework, we perceive that the legal reforms implemented during of the nineties would have enabled PETROBRAS to develop into just another private company. In this way, the interference of party politics was and is limited.

Regarding the second point, it mentions that PETROBRAS was created mainly to ensure domestic market supply, so in addition to the product import business, it also had to plan oil exploration. In this regard, worked, implemented and improved marine drilling, especially in deep waters. After several years, the goal of sustainable self-supply is about to be met due to the significant technological development mentioned above.

Collaterally, this technological development enables strategic alliances with other private and international companies to develop projects in Brazil and the rest of the world. This explains why, following the opening process, instead of competing, new operators in the Brazilian market decided to partner with PETROBRAS, because that company has the right technology to explore and produce in Brazil. However, the legal norms do not make creating this type of partnerships mandatory.

Finally, PETROBRAS' internationalization process makes it important not only on the domestic market, as it also has activities in the rest of Latin America and the world. It makes it possible for this company to be considered just another private company outside of Brazil.

2.1.2 Organization

PETROBRAS is a mixed-economy public corporation with open capital that is controlled by the Federal Government. This particular figure is possible through a system in which two types of shares coexist: ordinary, with voting rights; and preferential, without voting rights. Additionally, preferential shares are established as inconvertible into ordinary shares and vice-versa. For example, by July 2008 the Federal

Government had 55 % of all ordinary shares (Figure 1: Makeup of Ordinary Shares - July 2008) and 33 % of all capital stock (Figure 2: Makeup of Capital Stock - July 2008).

Figure 1: Makeup of Ordinary Shares - July 2008

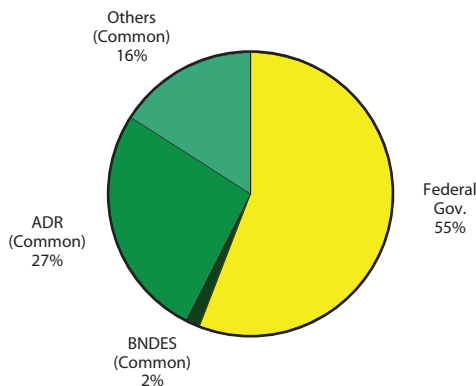
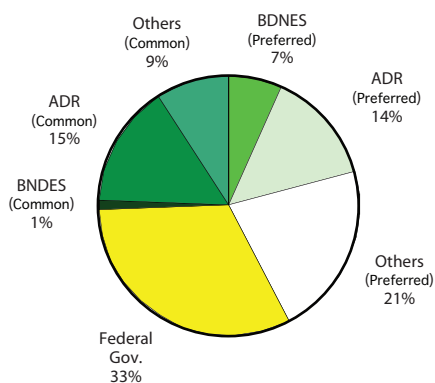


Figure 2: Makeup of Capital Stock - July 2008



Source: PETROBRAS S.A.

PETROBRAS' corporate "governance" is implemented through two groups within the company. The first is in charge of making strategies

and supervision, and the second is in charge of executing the strategies and developing the operations. The first group includes the Consejo Fiscal and the Consejo de Administración, and the second group is comprised of the Directorio, the Comités de Negocios and the Comités de Gestión. According to the general organizational chart, the Consejo Fiscal and the Consejo de Administración are above the Directorio,

The Consejo de Administración is made up of 9 members, 7 of which named by the Brazilian Government and two in representation of the preferred stock holders with voting rights. The Consejo Fiscal is the auditing committee and has two auditors. It is interesting to note that in PETROBRAS an audit can be performed based on one anonymous denouncement.

According to Campodónico (2007.a), one of the most important aspects of this structure is the Consejo Fiscal, made up of 5 members, 2 elected by the private sector, 1 by the minority shareholders (with voting rights), 1 by the preferential shareholders and 1 by the Ministry of Economy. This Consejo has a broad mandate to supervise the actions of the directors and report on the investment plans, capital budgets, the distribution of dividends and company mergers or divisions.

Another aspect that is worth highlighting is the company's administrative flexibility. Since the oil & gas business requires celerity in various processes, both administrative and technical, for various aspects the company has special regimes that are different from the rest of the public sector. For example, the tendering procedure is particular to the company and ad-hoc to the oil & gas business.

The main problem with the characteristic in the above paragraph is that company control by the Central Government would be limited. In this regard, there are various control and auditing levels, but one of them is particularly interesting, as it responds to the transparency requirement established by the regulatory institution of the New York Stock Exchange. Thus an interesting hypothesis arises: market control mechanisms would be efficient complements to those implemented by the Government, due to the business need to lend security to shareholders.

Information management is also peculiar, as it has two objectives: transparency and protection of information. They may appear contradictory, but the first ensures equal treatment for all persons requesting

information and the second prevents the company's confidential information from negatively affecting the value of its shares.

2.1.3 Plans and Projects

PETROBRAS' corporate planning process begins by formulating the Strategic Plan for a 20 year horizon. Analyzing the organization's external and internal factors, we find the company's future scenarios, vision, mission, values, goals, strategies, and strategic projects. Once this task is done, it defines five-year and one-year Business Plans that include company positioning, corporate goals, investments, financing, and vision by segment and area, from which exercise arises the company's project portfolio. Finally, as part of this process, there is monitoring of business performance goals, objectives and projects.

The actual regulatory system made it possible to order and clarify the relationship between the State-owned enterprise and the Brazilian State, as it offers the mechanisms and instruments necessary to keep business objectives from moving away from State policies, while allowing the company adequate "governance". Perhaps one of the determining variables for implementing this model is the fact that 60 % of the company's economic value is held by the private sector, while the Government holds 55 % of its voting capital. Therefore, although the Dirección Ejecutiva is in charge of maximizing share value (protecting the company's economic value), the Consejo de Administración acts as an important filter, as it supervises company performance.

Like any other private company, when PETROBRAS S.A. decides to implement its annual program, it needs to prioritize its projects, and decisions at this stage are made internally by the company. However, in order to ensure that they are in line with the goals of the Brazilian State, each of these projects are contained within medium and long term plans approved by the Government.

Table 1: Plans and Strategies - Institutional Relation presents the formal relations between PETROBRAS and the different Government agencies, showing what institutions are in charge of developing and/or approving documents relating to the company's business activity. We should highlight, once again, that the company's Directorio (and lower levels)

is in charge of developing and approving the business strategy, but endorsement is given by the Consejo de Administración.

Table 1: Plans and Strategies - Institutional Relationship

Institution	Strategic Plan	Business Plan	Multi-year Plan Gvmnt.	Yearly Investment Budget - Gvmnt.	Global Expense Program - Gvmnt.	Yearly Business Plan
National Congress			Approves	Approves		
National President			Coordinates, presents & sanctions	Coordinates, presents & sanctions	Approves	
Ministry of Planning, Budget and Management			Approves & presents	Approves & presents	Approves & presents	
Ministry of Mines and Energy			Approves & presents	Approves & presents	Approves & presents	
Administrative Council	Approves	Approves	Approves & presents	Approves & presents	Approves & presents	
Executive Director	Approves & presents	Approves & presents	Approves & presents	Approves & presents	Approves & presents	Approves
Business Strategy and Performance	Coordinates & presents	Coordinates & presents	Coordinates & presents	Coordinates & presents	Coordinates & presents	Coordinates & presents

Source: PETROBRAS

2.2 Compañía Nacional de Petróleo (ENAP) - Chile

The Compañía Nacional del Petróleo (ENAP) is the Chilean State-owned enterprise that explores and exploits oil and natural gas reservoirs through operation contracts, which it may do alone or in partnerships. It has two lines of business, Refining & Logistics and Exploration & Production. The first does refining and distribution business, and the second performs operations outside of the country, in exploration and production of course.

From 1950 to now, ENAP has discovered and operated 23 reservoirs in Chile, participated in 17 partnerships through which it developed refineries, transportation and distribution networks, etc., and it also has activities in Ecuador, Peru, Argentina, Iran, and Egypt. We should emphasize that ENAP's domestic production is not enough to cover market demand, so it is a net oil importing company.

2.2.1 Market Characteristics

Initially the State had a monopoly on all activities, but then competition was allowed, and now all markets are open to it. There is freedom to import crude oil and oil products, with the benefit that ENAP charges parity import prices. There is also the freedom to build refining plants, although ENAP's current installed capacity is almost sufficient to meet the demand of the domestic market. Furthermore, ENAP has approximately 85% market share, and the remaining 15% is imported by distribution companies.

Domestic sales prices are set using a formula that seeks import parity from Chile's primary market, the United States Gulf Coast, plus transportation and freight. This calculation is done weekly by the Comisión Nacional de Energía (CNE).

2.2.2 Organization

Based on article 3° of its organic law, ENAP is managed by a Board of Directors made up of the following persons:

- The Minister of Mining, who presides by his own right.
- The Executive Vice-president of the Corporación de Fomento de la Producción.
- Six directors, three appointed by the Corporación de Fomento de la Producción and three from private partnerships: 1) Sociedad de Fomento Fabril; 2) Instituto de Ingenieros en Minas; and 3) Sociedad Nacional de Minería.

The primary powers of the Board of Directors include approving:

- a. The five-year business plan
- b. The annual budget
- c. The debt policy

We should point out that within the company, unionized employees receive bonuses for meeting the goals, and there is a variable income system for executives. These bonuses are linked to meeting qualitative and quantitative goals and to business outcomes. On the other hand, directors respond with their equity to achieving this State-owned enterprise's goals and objectives.

Most company workers have life-long careers within the company, and there is a policy to train young personnel for the ultimate purpose of keeping them within the company.

2.2.3 Plans and Projects

All investment projects of arise from the lines of business, and are then prioritized according to their Net Present Value (NPV) and are ordered according to their NPV / Investment ratio. The planning area, along with the lines of business, develops five-year Strategic Business Plans and annual Management Plans.

The budgeting process is done together with the Treasury Department and also requires that the Treasury Department and the Ministry of Economy approve all financing and guarantees that commit public credit. It is good to point out that the Treasury Department approves the overall investment amount, but the company has sufficient flexibility to prioritize the investments it deems necessary.

The company is controlled by the Contraloría General de la República (CGR), an institution that in fact has offices within the company and is in charge of following up on legal compliance and business performance. The Comisión Nacional de Energía (CNE) also reviews and recommends any investments that ENAP requires for expansion purposes.

Given the current status of international oil prices and the growing natural gas demand, ENAP has become an important partner for the Government. For example, at present it is actively participating in installing a regasification plant at the Quintero port.

2.3 ECOPETROL - Colombia

The Colombian State Company, ECOPETROL, was created as a fully State-owned autonomous body with its own legal status. According to Decree Law No. 1760 of 2003, ECOPETROL became a public company

²⁷ Campodónico (2007.b).



through shares, related to the Ministry of Mines and Energy. As we will see below, this eliminated the double function the company had as a regulator and an operator.²⁷

2.3.1 Market Characteristics

The present makeup of the oil & gas sector in Colombia was recently implemented, and the current upstream contracts were approved less than five years ago. As in the Brazilian case, ECOPETROL is not the only one responsible for exploring and exploiting an oil or gas field, as that activity was opened to private companies. As in the Brazilian case, this made it necessary to create the Agencia Nacional de Hidrocarburos (ANH), an entity whose functions include managing and regulating the new contracts in effect.

In this regard, we could say that ECOPETROL has competition upstream, but that it has the monopoly of oil & gas transportation and refining. In fact, these monopolies would be considered natural due to the size of the Colombian domestic market.

2.3.2 Organization

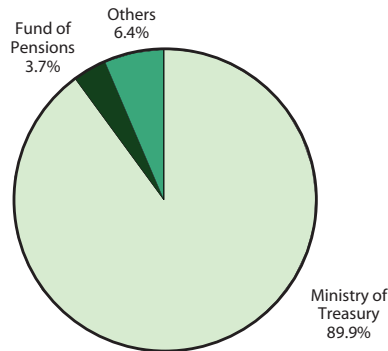
ECOPETROL's structure consists of a General Assembly of Shareholders made up of shareholder representatives named by the Board of Directors, which in turn has seven main members and their substitutes, three of which are named by the President of the Republic and four by the General Shareholders Assembly. The company President and Vice-president are elected from among these Board members.

The Board members it's integrated by nine (9) main members without substitutes who are chosen by the General Assembly of Shareholders for periods of (1) year, according the established Social Statutes. At least three (3) of the members are independent.

The President is chose by the Board members, the same for the substitutes, according the Social Statutes. The President's election is made looking for suitability, knowledge, experience and leadership approaches, being able to be reelected or removed in any time by the Board members.

With ECOPETROL's registration on the stock market, its new share make-up was as seen in Figure 3: Share Makeup of ECOPETROL (April, 28 2008). It shows that the Government, through the Ministerio de Hacienda y Crédito Público, has the largest share holding with almost 90 %. Of course, the company's profit sharing takes into account this makeup.

Figure 3: Share Makeup of ECOPETROL (April, 28 2008)



Source: ECOPETROL

Like other companies, ECOPETROL has social objectives. We should highlight the one that seeks to enhance the company's trust and reputation among interest groups such as shareholders, retirees, the Government, the press, etc.

2.3.3 Plans and Projects

Projects come from a Tactical Plan that is approved each year by the Board of Directors. Afterwards, projects to be executed during the year are decided on within the company. In general, the company's plans and projects are made autonomously, and Government participation is as a shareholder.

The budget, on the other hand, is approved by the Government, although there is already some agreement since the Government participates designing it in its capacity as a shareholder. On this point,

company members say it is positive that the International Monetary Fund (IMF) accepted to separate the company budget from the rest of the State, since the investment and financing restrictions that are generally requested of a country do not apply to this State-owned enterprise. They also said that most change policies applied to the company by the Government were proposed by the workers themselves under the following arguments:

- a. Demonstrating that the change was beneficial for all parties.
- b. Convincing them that the status quo was not favorable.
- c. Support from public opinion was important to achieve subsequent political support.

ECOPETROL is in a process of open internationalization since 2005, with expansion plans in Ecuador, Peru and Venezuela and an initial budget of US\$ 150 million in 2006.²⁸

2.4 Refinadora Costarricense de Petróleo (RECOPE) - Costa Rica

The Refinadora Costarricense de Petróleo S.A. (RECOPE) manages oil & gas imports, refining and bulk distribution, with completely State-owned capital stock. This company was founded in 1961 by a private business group, and in 1974 the State bought up all of the shares. As in the case of ENAP, RECOPE's main activity is importing oil, since Costa Rica is a net importer of this product.

2.4.1 Market Characteristics

In the case of RECOPE, the State holds all of its shares, and it has a monopoly on refining and wholesale distribution of crude oil and its derivatives. There are private companies devoted to transporting fuel in tanker trucks from the RECOPE facilities to service stations and other

²⁸ Campodónico (2007b).

consumers (industries). As for retail distribution, some private companies manage service stations others bottle and distribute Liquefied Petroleum Gas (LPG).

Due to the rise in oil prices over the past years and Costa Rica's heavy dependence on oil and product imports, a number of reforms are being considered that will enable greater private participation in the chain of oil & gas production,²⁹ refining, transportation, and commercialization.

The entity that regulates public utilities, including hydrocarbons, is the Autoridad Reguladora de los Servicios Públicos (ARESEP). In particular, it regulates the supply of fuels derived from the hydrocarbons and sets the transportation tariffs within the national territory. González (2007) says that ARESEP currently has problems “overlapping” functions with other State organizations, which hampers the regulatory process. One of this institution's main links with RECOPE is that sets the maximum prices for oil product sale on the domestic market.

2.4.2 Organization

As mentioned above, RECOPE S.A. is a State-owned enterprise established as a stock company, in which 100 % of all shares are State-owned through the Executive Branch. Its structure includes, in hierarchical order, the Ministry of Environment and Energy, the Board of Directors, the Executive President, and on down the rest of the company positions.

“The Executive President and other Board members are named by the Executive Branch for a 4-year period, except for the Vice-president of the Board, which according to current legislation is the Minister of the Environment and Energy or whoever the latter delegates. Managerial positions are named by the Executive President company and are considered positions of confidence”.³⁰

2.4.3 Plans and Projects

General Policies are made by the Executive Branch, as it holds 100 %

²⁹ Although the current legal framework allows private participation in oil & gas exploration and exploitation activities, little progress has been seen so far in this regard.

³⁰ González (2007).



of the company's capital stock. On the other hand, the Contraloría General de la Republica (CGR) approves the company budget, the Ministry of Economic Planning and Policymaking approves the investment plans, and company loans are approved by the Central Bank. As one can see, there are several institutions involved in approving the company's plans, budgets and loans.

As for controls, the Board of Directors is in charge of carrying out the internal audits, the CGR does the external supervision and, in addition, RECOPE contracts an annual external audit, both financial and operational. On the other hand, with each domestic price adjustment request, ARESEP evaluates company performance according to levels of expenditure and execution of investment projects, in order to verify whether resources from former adjustments were utilized as approved.

“The current legal and institutional framework does not allow RECOPE, despite being structured as a stock (private law) company, to act as such in order to take advantage of certain benefits allowed that figure, such as more expedite procurement processes for goods and services, contracting highly skilled personnel with competitive salaries similar to the market, greater investment and debt capacity, and finally forging strategic alliances with private sector companies that could heighten its performance as a company that is responsible for the oil & gas sector, so vital to the country's sustainable human development.”³¹

2.5 **Petróleos del Perú S.A. (PETROPERÚ) - Perú**

The Peruvian case is rather peculiar, as there are two State-owned enterprises, Petróleos del Perú S.A. (PETROPERU) and PERUPETRO. The former can be defined as the usual State oil company that was subsequently privatized, while the latter was created to manage oil & gas exploration and exploitation contracts as consequence of that privatization process. In fact, it was part of PETROPERU that was subsequently turned into a company. It is also necessary to emphasize that the privatization process was not completed, that PETROPERU did not stop operations, and that it is presently in a process of business renovation.

³¹ González (2007).

2.5.1 Market Characteristics

Until 1992, PETROPERU monopolized the wholesale refining and commercialization market, while private participation was seen in retail sales. On the other hand, private contractors were allowed to participate in the exploration and exploitation business under the law that was in effect at that time.

PETROPERU's privatization process, developed during 1992-1996 under Law No. 26221 known as the Hydrocarbons Organic Law, enabled diverse private operators to enter activities that until then had been reserved for PETROPERU: refining, storage, dispatch at terminals and sales plants, and wholesale fuel sale. Simultaneously, oil lots were privatized in the Northeastern and Northern Amazon regions, thereby freeing PETROPERU from up-stream operations.

Nevertheless, the Company remained the primary buyer of the country's oil production and is presently carrying out exploration activities in partnership with other State-owned and private companies. The company's participation at different stages of the production chain is seen in Table 2: PETROPERU's Participation in the Oil & Gas Market (2008), in which the company clearly does not have a monopoly over any of the activities and in general faces oligopoly markets.

Table 2: PETROPERU's Participation in the Oil & Gas Market (2008)

Activity	Market	Share of the main operators	
Liquid hydrocarbons production	Oligopoly	Pluspetrol	68%
Production of refined products	Oligopoly	PETROPERU Repsol-YPF Pluspetrol	41% 42% 14%
Storage and dispatch of fuels in plants and terminals under concession	Oligopoly	PETROPERU Repsol-YPF	52% 46%
Retail sales (approximately 2,600 service stations)	Competition	Petrorad (PETROPERU) Repsol Pecsa Primax	425% 237% 211% 168%
Oil transportation through pipe-lines (Oleoducto Nor Peruano)	Monopoly	One-on-one relationship, with Pluspetrol as the only customer	

Source: PETROPERU

PETROPERU also participates in the international market in its crude oil and diesel importing operations and its natural gasoline and fuel oil exporting operations, carried out through open competition.

2.5.2 Organization

PETROPERU is a private-law State-owned enterprise, 100 % of whose shares are owned by the State. It was created via Decree Law No. 17753 of July 24, 1969, and is governed by its organic law approved on March 4, 1981, through Legislative Decree No. 43, amended by Law No. 26224 of August 23, 1993, Law No. 24948 (Law of State Business Activities of December 20, 1988), amended by Law No. 27170 (Law of the Fondo Nacional de Financiamiento de la Actividad Empresarial del Estado of September 8, 1999).

PETROPERU's current corporate by-laws, approved via DS 024-2002-EM on August 21, 2002, sets its purpose as carrying out oil & gas activities as set forth in the Organic Law of Hydrocarbons. PETROPERU S.A. acts with full economic, financial and administrative autonomy according to the goals, policies and strategies approved by the Ministry of Energy and Mines. Furthermore, it is enabled to enter into and formalize all types of memoranda and contracts, and in its foreign trade operations to follow the uses and customs of international trade and the generally-accepted rules of international law and the oil & gas industry.

On July 23, 2006, the National Congress enacted Law No. 28840 to strengthen and modernize the company Petr leos del Per  - PETROPERU S.A. The purpose for this law was to afford the company greater autonomy in the development of its activities, removing it from the sphere of the Fondo Nacional de Financiamiento de la Actividad Empresarial del Estado (FONAFE), the rules and regulations of the Sistema Nacional de Inversi n P blica (SNIP). It also revitalizes its procurement and contracting processes in coordination with the Consejo Superior de Contrataciones y Adquisiciones del Estado (CONSUCODE).

Law No. 28244 authorized PETROPERU to negotiate contracts with PERU-PETRO S.A. for oil exploration and exploitation operations and services. This enables PETROPERU to play the contractor's role, which it had been forbidden to do by Law No. 26221, the Organic Law of Hydrocarbons.

Hierarchically, PETROPERU has a Board of Directors, with its President, followed by the managers and the rest of positions in the company. Articles 10 and 11 of Law No. 28840 provide for a General Shareholders Assembly, thereby stipulating the formation of the Board of Directors PETROPERU S.A. with 6 members appointed as follows:

- Five directors with professional experience and capacity, appointed by the General Shareholders Assembly, one of them being named as the Board President working full time.
- A Director appointed by the company workers via universal, direct, secret election, supervised by the Oficina Nacional de Procesos Electorales (ONPE).

The directors are appointed for a renewable period of three years. The director representing the workers is elected for two years. Directors can be removed by the General Shareholders Assembly when not meeting the yearly goals or for serious faults.

Finally, we should point out that the control problems mentioned in the theoretical section were solved in this company by encouraging workers to participate collectively in negotiating their working conditions. In this way, following a period of evaluation, a decision was reached to raise their salaries.

2.5.3 Plans and Projects

Generally the Dirección General de Hidrocarburos, under the Ministry of Mines and Energy, develops the oil & gas referential plan and development plan. Each year, laws are enacted to determine how and under what conditions the respective budget should be applied.

The decision to execute an investment project is regulated by the Directiva de Formulación y Evaluación de Proyectos de Inversión, which approves pre-investment studies according to the project cycle (profile, pre-feasibility and feasibility). Subsequently, execution is decided on when the Feasibility Study is approved by the General Manager and/or the Board of Directors, depending on the investment amount.



According to Law No. 28840, aimed to strengthen and modernize Petróleos del Perú, the company has economic, financial and administrative autonomy within the annual and five-year goals approved by the Ministry of Energy and Mines. On the other hand, PETROPERU works under the regulations of diverse institutions such as Osinergmin, the Ministry of Energy and Mines, the Dirección General de Hidrocarburos, and the Ministry of Economy and Finance.

We should highlight that as a help the company uses a mathematical optimization model by which it designs, plans and executes all of its supply chain activities. Through this type of model, the company knows the optimum strategy for the production, transportation and commercialization of refined products according to restrictions relating to demand, prices, freight, and operational factors.

2.6 Administración Nacional de Combustibles, Alcohol y Pórtland (ANCAP) - Uruguay

The Administración Nacional de Combustibles, Alcohol y Pórtland (ANCAP) is a vertically integrated State-owned enterprise that participates at the various stages of the oil and natural gas industry. The company's main activity is importing oil and oil products, since Uruguay is a net importer country.

2.6.1 Market Characteristics

ANCAP has the monopoly of importing crude oil and products, refining oil and exporting oil products. Wholesale distribution of oil products is through four distribution companies: DUCSA, ESSO, TEXACO, and SHELL. DUCSA is a stock company, most of whose capital stock is owned by ANCAP (99 %). The distribution market structure was changed last year when PETROBRAS purchased the network of SHELL stations and ANCAP purchased the network of TEXACO stations.

Wholesale kerosene distribution is done by the company DIKAMSA, and at the retail level there is a broad network of stations with the following distribution: DUCSA (207 service stations), ESSO (110), SHELL (90), and TEXACO (91). LPG is distributed through three private wholesale

companies: Acodike Supergás S.A., Riogás S.A. and Gas Uruguay S.A. (Gasur S.A.), the latter being for bulk distribution. At the retail level, the company MEGAL is added, with distribution of 3 Kg containers. Since the LPG market opened, ANCAP entered into retail distribution through DUCSA. In the case of bulk distribution, ANCAP participates with 40% of the capital stock in the company GASUR.

Law No. 17,598 created the Unidad Reguladora de Servicios de Energía y Agua (URSEA), in charge of regulating and controlling activities relating to power, hydrocarbons (oil and gas) and water & sanitation utilities.

As for the regulatory framework, in late 2001 a law was passed establishing the de-monopolization of crude oil imports, exports and refining, and oil product exports to the favour of ANCAP. Specifically, Law No. 17,448 established gradual derogation of ANCAP's monopoly on crude oil and products import and refining enabled private enterprises to partner with ANCAP. It also established that the maximum sales price for fuels at the "refinery door" (before taxes), should be set at a level similar to the parity import price. However, this de-monopolization process never got off the ground, since the law was derogated via a plebiscite in November 2003.

2.6.2 Organization

From an institutional viewpoint, ANCAP is a State-owned enterprise that reports to the Ministry of Industry, Energy and Mining (MIEM), while the Oficina de Planeamiento y Presupuesto (OPP) has a control function related to matters of tariff and investment levels.

From an organizational viewpoint, ANCAP is a vertically-integrated State-owned company, and is legally an Autonomous Entity. Company direction is through a Board of Directors made up of five members appointed directly by the Executive Branch. Traditionally, the Board of Directors has consisted of one or two directors that represent the non-official political sectors, as a means to control company management.³²

During the current government administration, opposition sectors refused to have members on the company Board, and a decision was

³² Gaudio (2007).



made to leave these positions vacant and leave the company's Board of Directors with 3 members. The term for Board members is 5 years, renewable at the end of the government regime with the change of administration. Although these are political positions, as of the current regime there has been a tendency towards professionalizing company directors, and now Board membership is both political and technical. With regard to the company's managerial positions, these are career officers who pertain to the company's functional structure.³³

Company management is controlled through the Central Administration comptroller agencies. With regard to the procedures for procurement, personnel contracting, investments and all another types of contracting, it should be in accordance with the procurement and contracting regime in effect for the Central Administration. The Tribunal de Cuentas is the comptroller agency that intervenes throughout this process and supervises that the contracting process is performed pursuant to the Central Administration regulations.

ANCAP has to contract a yearly external, independent auditor to assess the company's economic-financial management. The economic and financial outcomes and balances are made available to the public; no regulatory framework has been established by the Executive Branch for the distribution and commercialization of oil products. In practice, the regulatory framework has been determined so far through ANCAP's contracts with distribution companies. Through these contracts, ANCAP defines distributor trade margins, service station margins, technical specifications, product quality ranges, and safety standards to govern transportation and storage.

2.6.3 Plans and Projects

The "2007-2011 Strategic Plan", recently approved by the ANCAP Board of Directors, defines the company strategy in each of its business areas. Without prejudice to ANCAP's ability as an Autonomous Entity to design its own Strategic Plan, it should be framed within the "Energy Policy Guidelines" defined by the Ministry of Industry, Energy and Mining for the oil & gas sector.

³³ Gaudioso (2007).

The Oficina de Planeamiento y Presupuesto (OPP), under the Executive Branch, has the power to approve the Five-year Budgets for State-owned enterprises, and to authorize company investments and level of indebtedness. It also approves public utility tariffs in coordination with the Ministry of Industry, Energy and Mining and the Ministry of Economy and Finance. In the particular case of the oil & gas sector, the Oficina de Planeamiento y Presupuesto approves ANCAP's Annual Work Plan and Five-year Budget and Investment Plan.

Without prejudice to the above, the company's Annual Work Plan, the Five-year Budget and the Investments Budget should be approved by the Executive Branch, through the Oficina de Planeamiento y Presupuesto. ANCAP designs the company's Strategic Plan, which once defined is submitted to the consideration of the Ministry of Industry, Energy and Mining, to ensure that the Plan is in line with the energy policy goals and strategies established by the Ministry of Industry, Energy and Mining.

2.7 Good Practices

Taking into account the case studies performed by the international consultants, additional information provided by the companies, and interviews that the author had with their representatives, certain business practices could be identified that produced positive outcomes. The most important ones are given below:

- In the six case studies, the State-owned enterprise has a dominant market position, either because it is ensured through current legal norms or because these companies, even when faced with competition, remained market leaders. However, greater flexibility and autonomy is seen in the business decisions of companies that have competition.
- One of the goals when a State-owned enterprise has a share package, even when 100% of all shares belong to the State, is to grant greater flexibility in its management. It helps very little to have that share package if on the other hand there is a set of legal norms go against granting the company greater flexibility.
- It is usual to find that the medium and long term expansion and investment plans are approved together with the respec-



tive ministries, particularly the Treasury. However, there is a fair amount of flexibility to execute annual plans. In fact, some companies have full independence to design these plans, and in some cases Governments participate in project design and implementation in their capacity as partners.

- It would seem very useful for the Central Government to participate in developing State-owned enterprise plans and projects. In this way, when they need to be approved at a more formal level, they do not receive many objections of the Government itself.
- There are cases where companies grant bonuses (to their staff) for meeting qualitative and quantitative goals, which helps solve the agency problem mentioned in the first chapter of this work. Labour stability also creates an appropriate environment for workers to do a better job and, perhaps more importantly, medium and long term plans get implemented.

Some companies solved the control problems mentioned in the theoretical section by promoting the collective participation of workers in negotiating their working conditions. In this way, after an evaluation process, wage raises or training policies are decided on.

- In oil importing countries, the State-owned enterprise generally takes care of refining and distributing oil products. Therefore, when prices are on the rise (as they are now) it is good to keep fluid communication and coordination between the Treasury Department, the price regulatory agency and the State-owned enterprise. In this way, domestic oil product price adjustments harm neither company finances nor tax collection.
- In countries with crude oil import companies, it seems to be a good practice for the regulating entity to evaluate the State-owned enterprise operating and capital costs with each domestic oil product price readjustment, in order to check whether early adjustments were utilized correctly.
- Workers of State-owned enterprises undergoing reforms did everything necessary to amend the legal norms, so that the admin-

istrative and operational processes inherent in the oil business would move away from those usually seen in the public sector. In this way, special norms were created that applied only to State oil & gas companies. On the other hand, in consolidated or successful companies such as PETROBRAS and ECOPETROL, this type of special regulation is common practice.

This section sought to find positive characteristics and practices in the State-owned enterprises under review. However, it is very difficult to find only one model of an efficient company, since the success of a State-owned enterprise depends on the characteristics of each country, its markets, prices, reserves, and others. Therefore, a State-owned enterprise could take into account what other countries have done, but it is not a trivial task to analyze the characteristics of each country and develop a “tailor made” State-owned enterprise.

3 Comparative Analysis

In this section we will review some of the characteristics of the region's main State-owned enterprises related to the oil & gas sector. In particular, we hope to understand: 1) some of their business design characteristics, and 2) their financial indicators. This latter group of data will enable us to empirically analyse the financial efficiency of the State-owned enterprises under consideration. The companies reviewed are:³⁴

1	ANCAP	Uruguay
2	ECOPETROL	Colombia
3	ENAP	Chile
4	NGC	Trinidad & Tobago
5	PDVSA	Venezuela
6	PEMEX	México
7	PETROBRAS	Brasil
8	PETROECUADOR	Ecuador
9	PETROPERÚ	Perú
10	RECOPE	Costa Rica

This section begins by presenting a theoretical model that attempts to gather some central facts, observed in the case studies, on the relations between Governments and State-owned enterprises. In particular, we wish to study how a given policy of the Central Government affects their financial performance.

In the second section we do the empirical analysis mentioned above, for which we reviewed the 2000 - 2007 annual memories of the companies under study. Of all the information available, two aspects were analyzed: a) State-owned enterprise earnings before taxes, royalties and any other transfer; and b) profits for the period. Regarding the

³⁴ Although there are more State-owned enterprises in the region, limited access to information forced us to restrict the study to those mentioned.

first variable, we should note that in many cases the State-owned enterprise acts as a consumption taxes withholding agent. In this regard, this concept is considered within the cost structure, and in many cases there is no detailed information, so it was necessary to estimate these values crossing information with collection agencies in each country.

3.1 The Theoretical Model

This section will present the model that seeks to describe the relationship between State-owned enterprises and governments, observed in the case studies. The first part presents the assumptions and relations, and the second performs numeric exercises by changing certain parameters. In this way will be possible to propose alternatives to solve the problems found by changing some of the parameters or relations.

3.1.1 Assumptions and Specifications

We began by defining the following variables:

- Y_t = State-owned enterprise production.
- M_t = Net fuel imports, whether or not by the State-owned enterprise.
- σ_t = Government share in State-owned enterprise revenues.
- p_t = Sales price for State-owned enterprise production.
- K_t = Capital used by the State-owned enterprise.
- r = Cost of capital, assumed to be equal to 1.
- D_t = Total demand, assumed to be equal to 1, therefore $Y_t + M_t = 1$.
- α = Productivity of the production factor.

The relations between State oil & gas companies and Governments have a characteristic that is usually not observed in other State-owned enterprises. This means that if the State-owned enterprise generates surplus (for example for export), it is subject to greater tax pressure by the Government (in the form of transfers, taxes, royalties, etc.). On the other hand, if the country is a net oil & gas importer, then the tax pressure on the companies decreases. In this regard, we assume that the



Government maximizes the following objective function:

$$G_t = \sigma_t (Y_t - M_{t-1})$$

According to this, when the country generates a surplus export, the Government receives positive transfers, but when the country is net importer, the Government grants a subsidy for imports. Seen in another way, for the Government it is positive for the State-owned enterprise to produce more (as this increases its transfer) but it is negative for it to import more, as which would affect the subsidy it grants. Imports during the previous period are taken into account, since this is the last observation that the Government would have to implement a given value of σ_t .

The profit function for the State-owned enterprise is:

$$\pi_t = p_t Y_t - r_t K_t - \sigma_t p_t Y_t$$

And the production function is:

$$Y_t = K_t^\alpha \quad 0 < \alpha < 1$$

Maximizing profits, we obtain the supply function,³⁵ which in a way is the function of the State-owned enterprise's reaction to the company transfer policies. In this case we assume that the State-owned enterprise seeks to maximize its earnings like a private company. The functional specification of this behavior is:

$$Y_t^* = (p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}}$$

The profit function remains as follows:

$$\pi_t^* = p_t (1 - \sigma_t) \left((p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}} \right) - \left((p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}} \right)^{\frac{1}{\alpha}}$$

Thus, the Government's goal function takes the following form:

$$G_t = \sigma_t \left((p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}} - M_{t-1} \right)$$

³⁵ Y_t^* = optimum amount of production.

To find the value of σ_t that maximizes the goal function, we take the following derivative:

$$\frac{\partial G}{\partial \sigma} = \sigma_t (p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}} - \sigma_t \frac{p_t \alpha^2}{1-\alpha} (p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}-1} - M_{t-1} = 0$$

Rewriting the equation, we get:

$$\sigma_t (p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}} - \sigma_t \frac{p_t \alpha^2}{1-\alpha} (p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}-1} = 1 - Y_{t-1}$$

Replacing the supply function for the previous period, and with some algebraic work, we get:

$$(p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}} \cdot \left(1 - \frac{\sigma_t \alpha}{(1-\alpha)(1-\sigma_t)} \right) = 1 - (p_{t-1} \alpha (1 - \sigma_{t-1}))^{\frac{\alpha}{1-\alpha}}$$

As we can see, the result is a difference equation whose solution depends on the value of α_t ,³⁶ the sales price behavior p_t and the initial value of the transfers (σ_0). Since the algebraic solution difficult to manage, below we will go through numeric exercises to evaluate the behavior of σ_t in time, that is, we wish to assess how the Government's share in the State-owned enterprise revenues varies in time. We should note that this share is optimal in the sense that it maximizes the Government's goal function.

3.1.2 Numerical Outcomes

To order and clarify the presentation of the numerical outcomes, we will start with a particular case of the production function and then enable certain sensitivity in some of the parameters.³⁷ In this regard, first we present the results when $\alpha = 0.5$ and the sales price for the product remain constant in the time ($\dot{p}_t = 0$).

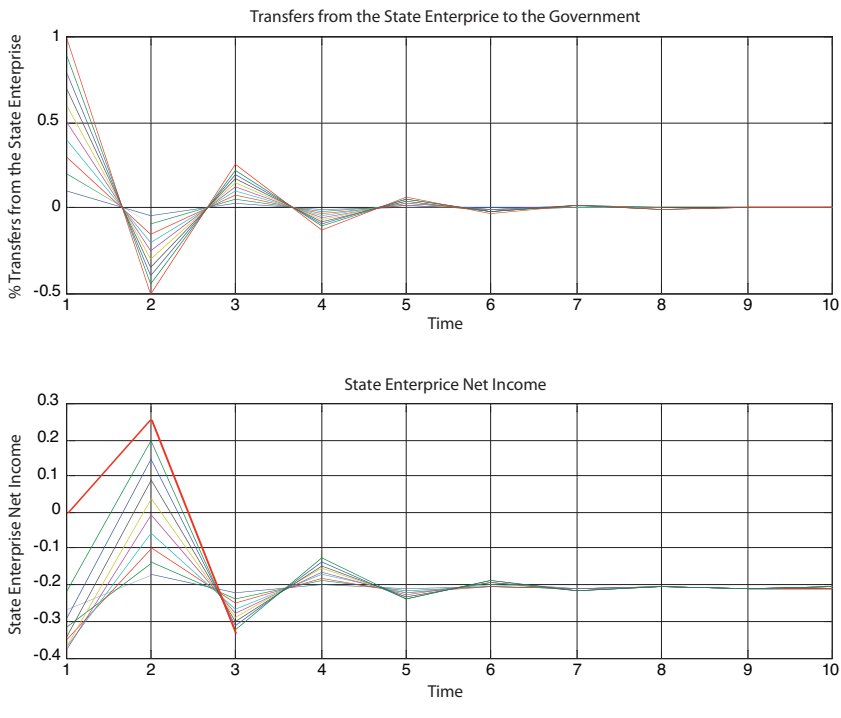
Figure 4: Particular Case - Constant Prices, shows the dynamic behav-

³⁶ Productivity of the input.

³⁷ The Matlab codes used can be found at mauricio.medinaceli@olade.org.ec

ior of the transfer percentage applied by the Government to the State-owned enterprise (σ_t) under different initial values σ_0 , as well as the profit behavior of the State-owned enterprise (π_t^*). The first characteristic that stands out is the fluctuating behavior of σ_t , for example, when the Government begins with very high transfer values (near 100 %), this means that the State-owned enterprise will need a subsidy of nearly 50 % in the following period. This in turn causes State-owned enterprise earnings to show a similar behavior. It is interesting to note that State-owned enterprise profits converge in a negative value, as this profit is not in the Government's goal function.

Figure 4: Particular Case - Constant Prices



In this way, the simple model posed reproduces the cyclic behavior of

the relations between State oil companies and Governments. When the domestic market supply is met, then it is optimal for the Government to apply high transfer percentages, but this high transfer causes production to drop in the following period, thereby increasing imports. Therefore, in this new situation, the optimum Government policy is to have negative transfers (subsidies) to the State-owned enterprise.³⁸

Figure 5: Particular Case - Rising Prices

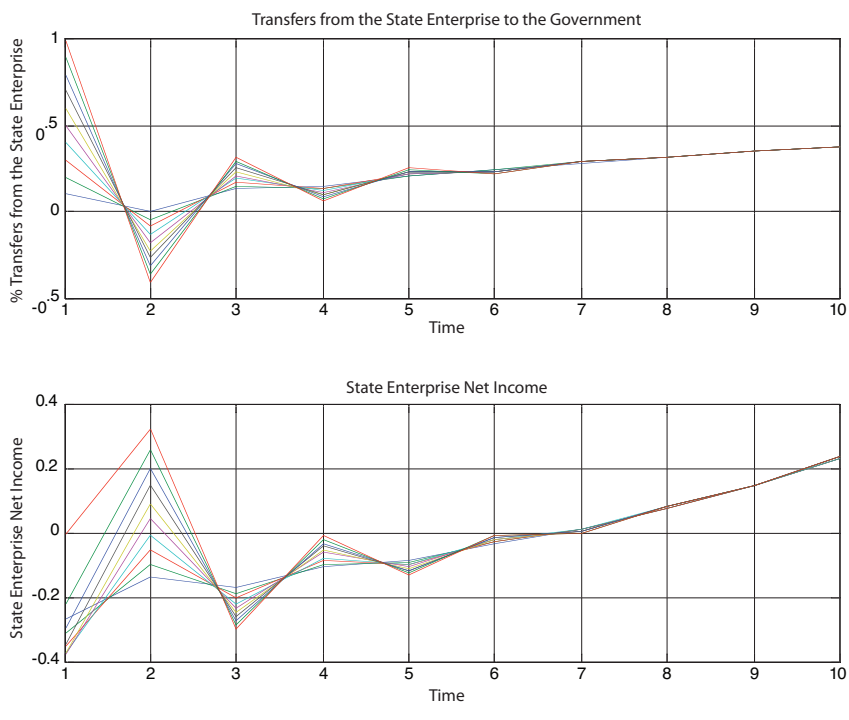


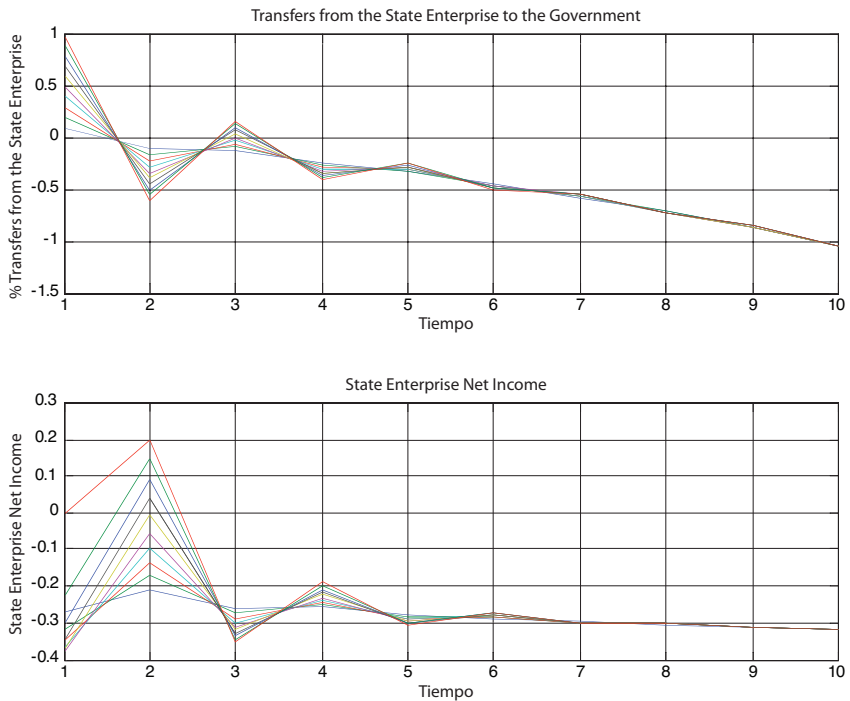
Figure 5: Particular Case - Rising Prices, shows the results in the case of rising prices³⁹ ($p_t > 0$) under the particular case in the production

³⁸ One can think of each period "t" is made up of 5 or 10-year periods.

³⁹ The price rises at 10 % per annum in each period.

function. Certainly the fluctuating and convergent behavior remains, but in this case with a slight upward trend, both in σ_t and in State-owned enterprise earnings. This result suggests something fairly intuitive: if the Government wants to ensure supply for the domestic market, it is optimal the transfer percentage growth rate to be related to the price behavior. The higher the price the greater the transfer percentage, with the opposite ($p_t < 0$) also being valid, as is clear in Figure 6: Particular Case - Falling Prices.

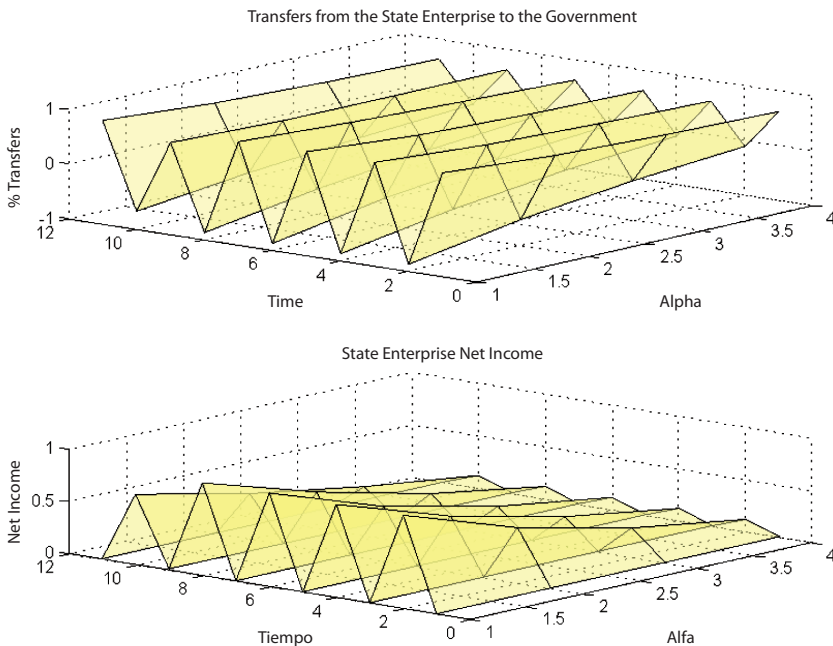
Figure 6: Particular Case - Falling Prices



Until now it was assumed that $\alpha = 0.5$, therefore earlier scenarios are a particular case of the production function. Below are the findings when this parameter, being a proxy of the factor productivity, is allowed to vary. Anticipating the results, we will see that the convergence observed above is not maintained, but the causality relations are.

Figure 7: General Case - Constant Prices, shows the evolution of transfer percentages to different values of α (alpha). Two facts stand out: first, that the convergence observed in the particular case decreases, and second, that as parameter α increases, the variability is lower. Thus, the model suggests that as productivity rises the transfer percentage will be less variable. However, at given values of this productivity, the fluctuating behavior does not converge to a given value.

Figure 7: General Case - Constant Prices



On the other hand, the variability of company profits is also maintained, but we also observe that as alpha increases the earnings decrease, since State participation grows in a greater proportion. An interesting hypothesis arises from this, the State-owned enterprise's incentive to increase its productivity would be low, since the higher the productivity, the greater the transfer to the Government and, therefore, the lower the earnings.

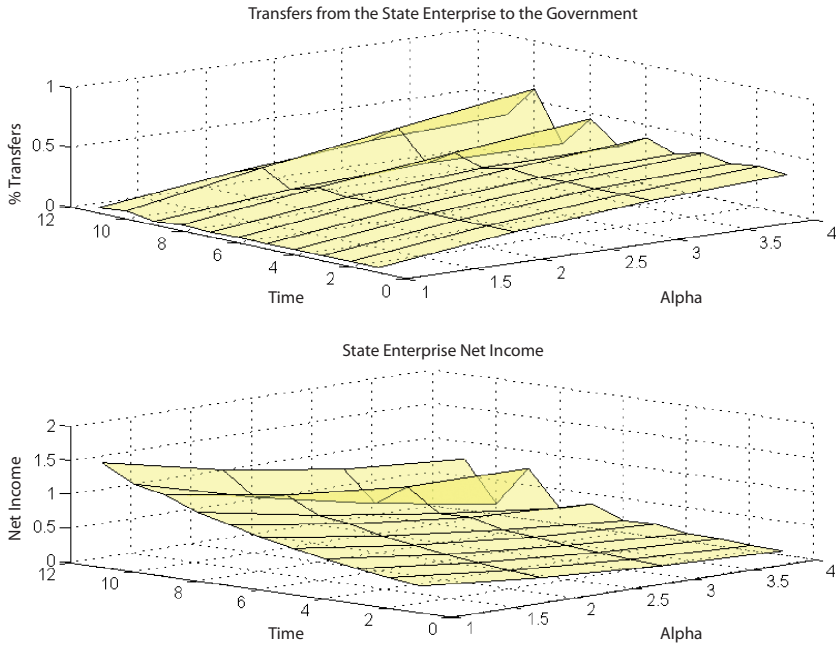
Figure 8: General case - Rising Prices

Figure 8: General Case - Rising Prices, shows the behavior of the transfer percentage in a rising price context.⁴⁰ Certainly the fluctuating behavior persists, and also the fact that it is optimal for the Government to apply positive transfer rates. Therefore, the conclusion of the particular case is maintained: if the Government wants to ensure domestic market supply and obtain a share of the State-owned enterprise, this transfer should be positively correlated with the price behavior. For example, if the State-owned enterprise faces subsidized prices on the domestic market, the transfer percentage should be consistent, i.e., should not be high.

⁴⁰ The price rises by 10 % for each period.

3.1.3 Possible Solution

According to the findings and taking into account the experience of PETROBRAS and, especially, of ECOPETROL, it is possible propose the following solution: instead of calculating the transfers as a percentage of gross revenues, they can be calculated as a percentage of the company earnings. A practical possibility for this solution is posed by ECOPETROL, where the Government receives most of the State-owned enterprise earnings because it has almost 90 % of its shares.

The State-owned enterprise earnings function in this new situation is:

$$\pi_t = (1 - \sigma_t)(p_t Y_t - r_t K_t)$$

By maximizing profits, we obtain the following expression for the company's supply function:

$$Y_t^* = (p_t \alpha)^{\frac{\alpha}{1-\alpha}}$$

Thus, the Government's goal function would be as follows:

$$G_t = \sigma_t \left((p_t \alpha)^{\frac{\alpha}{1-\alpha}} - \left(1 - (p_{t-1} \alpha)^{\frac{\alpha}{1-\alpha}} \right) \right)$$

From these findings, we can draw two conclusions: 1) the level that the Government decides to apply to α does not affect company supply, since the Government has a share in company earnings; and 2) the Government can apply $\sigma_t = 1$, seeking to maximize its goal function, without affecting domestic market supplies.

3.1.4 The Producers Companies

Up to now the behavior of a State Company assumes that can be, indistinctly, producer or importer. However, for some companies in the region the main activity is the exploitation and commercialization of petroleum and natural gas, for it, the relationship before outlined it can modify in the following way.

The Government maximizes the following objective function:

$$G_t = \sigma_t (\beta_t \cdot Y_t - M_{t-1})$$

The difference with the previous specification is the parameter β_t , it represents the additional profit/loss that would have the State because the sales production price is different to the price (p_t) used to calculate the optimal capital and, for it, the optimal production Y_t^* .⁴¹

The profit function of the State Company remains the same:

$$\pi_t = p_t Y_t - r_t K_t - \sigma_t p_t Y_t$$

The supply and profit functions are the same:

$$Y_t^* = (p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}}$$

$$\pi_t^* = p_t (1 - \sigma_t) \left((p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}} \right) - \left((p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}} \right)^{\frac{1}{\alpha}}$$

Now, the Government's goal function takes the following form:

$$G_t = \sigma_t \left(\beta_t (p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}} - M_{t-1} \right)$$

To find the value of σ_t that maximizes the goal function, we take the following derivative:

$$\frac{\partial G}{\partial \sigma} = \sigma_t \beta_t (p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}} - \beta_t \sigma_t \frac{p_t \alpha^2}{1 - \alpha} (p_t \alpha (1 - \sigma_t))^{\frac{\alpha}{1-\alpha}-1} - M_{t-1} = 0$$

Rewriting the equation, and assuming that (p_t) doesn't change ($p_t = p_{t-1} = p$) and $\alpha = 0.5$, we get:

$$\sigma_t = \left(\frac{p - 2 - p \cdot \sigma_{t-1}}{\beta_t \cdot p} \right)^{1/2}$$

⁴¹ If $0 < \beta_t < 1$, then the sales prices is lower than the prices used to calculate the capital investment. When $\beta_t > 1$, the Government obtains profits because the price is above its expected value. It is assumed that the company doesn't take into account this additional mark up, because it considers it transitory.

With this result, we will analyze the behavior of σ_t under the following assumptions: a) $\sigma_0 = 0.5$, b) $p = 20$ and, c) $\beta_t = 2$. Since $\beta_t = 2$, this scenario considers that the price of sale of the product is twice as much to the price used to determine the level of optimal capital. Figure 9 shows that the oscillation of the percentage of transfers, from the State Company to the Government, is small, compared with the previous scenarios.

Figure 9: Producers Companies - High Sales Prices

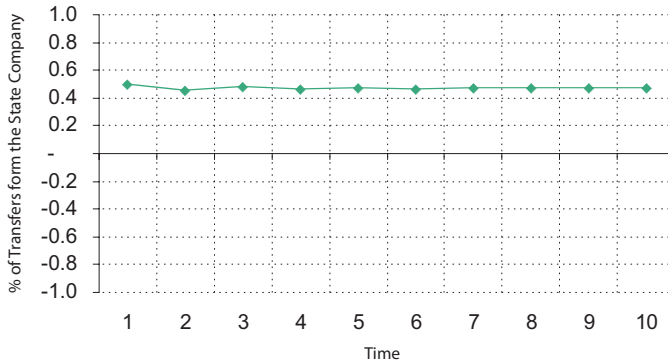
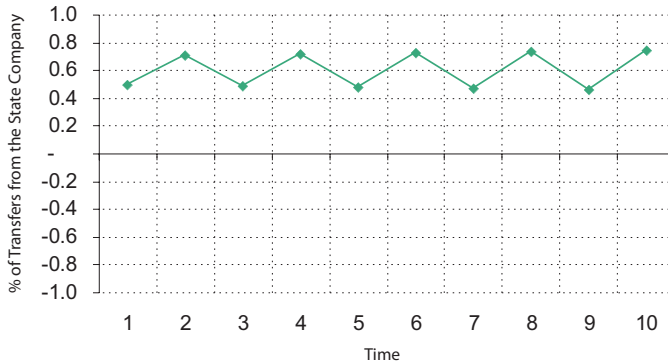


Figure 10: Producers Companies - Low Sales Prices





On the other hand, if $\beta_i = 0.8$, is assumed that, i.e., the sale price is smaller to the one used to calculate the optimal capital, the variability in the percentage of transfers is bigger, see Figure 10. We can deduce that, the bigger mark up insert in the sales price, the lower the variation in the percentage of transfers.

This section suggests a quite particular result, when a State Company is a hydrocarbons producer and the oil sales prices is above the price used to calculate the optimal capital, then it is not optimal for the Government to vary the percentage of transfers, from the state company, significantly.

3.1.5 Some Considerations

The main conclusions of the theoretical model are:

- The Government's goal function as used in the model considers that it will wish to increase State-owned enterprise production (as this generates greater transfers), but it is penalized by added imports. This penalization comes in the form of negative transfers.
- Utilizing the theoretical model we see that under certain standard conditions, it is optimal for the Government to apply cyclic transfer rates (from the State-owned enterprise to the Government). For example, if the Government starts to apply high transfers, it will reduce the State-owned enterprise's incentive to produce, placing domestic market supply at risk and obliging the Government to decrease transfers in the following period.
- On the other hand, if sales prices (of the State-owned enterprise) are allowed to grow, then it is possible to apply high transfer percentages and still ensure domestic market supply. From this we conclude that like any private company, will be efficient for the transfer rate from the State-owned enterprise to the Government to consistent (positive correlation) with the sales price behaviour, since the greater the price the greater the transfers, with the opposite also being valid.
- When input productivity is allowed to vary, an interesting result arises: the greater the productivity, the greater the transfer and the lower the earnings for the State-owned enterprise.

From this we obtain the following hypothesis (not analyzed in this paper), that the State-owned enterprise incentive to improve its productivity is low, since this improvement is appropriated by the Government through greater transfers. Furthermore this appropriation not only eliminates earnings from production, but also captures some of the past rent. Therefore, State-owned enterprise earnings are less than in the former situation of lower productivity.

- One possibility to solve these problems is for transfers from the State-owned enterprise to the Government to be calculated on earnings from operations. This way, even should the Government impose high shares, it will not affect domestic market supply.
- When a State Company is a hydrocarbons producer and the sale oil prices is above the price used to calculate the optimal capital, then it is not optimal for the Government to vary the percentage of transfers, from the state company, significantly.

The findings of this model suggest that State-owned enterprise earnings (performance), depend not only on its having a profit-maximizing behaviour, but are also influenced (to a large degree) on the application of fees, taxes, shares, transfers, etc. applied by the Government. In fact, the Government's behaviour could condition State-owned enterprise earnings and performance. Therefore, if a policy of cyclical transfers is optimal for the Government, this leaves very little space for the State-owned enterprise to have medium and long term planning policies. In this regard, improving State-owned enterprise performance in any case requires modifying the Government's goal function.

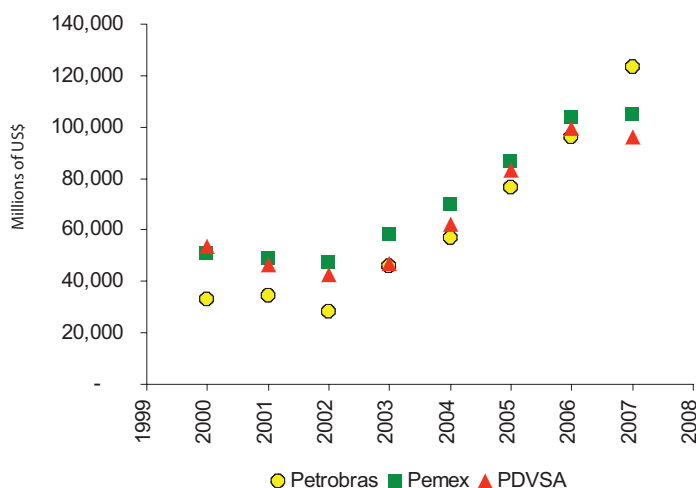
3.2 Empirical Analysis

This section compares some of the financial indicators for State oil & gas companies. The source of data for these indicators is the annual memoirs usually published by each of these companies. Although the oil & gas sector has other comparative criteria, reserves, production, etc., only the financial criteria were taken into account for two reasons: 1) not all companies are oil & gas producers; and 2) the access to or existence of information is limited.

3.2.1 Large-scale Producers - Group 1

Figure 11: Gross Revenues of Large-scale Companies, shows the evolution of gross revenues for the three companies making up this group: PETROBRAS, PEMEX and PDVSA. As was expected, the size of their operations is fairly similar, so this grouping does not seem incorrect. In fact, the rising oil prices during the review period enabled these three companies to experience almost sustained increases in their revenues, except for 2007, when PETROBRAS' income was different from the other two companies.

Figure 11: Gross Revenues of Large-scale Companies



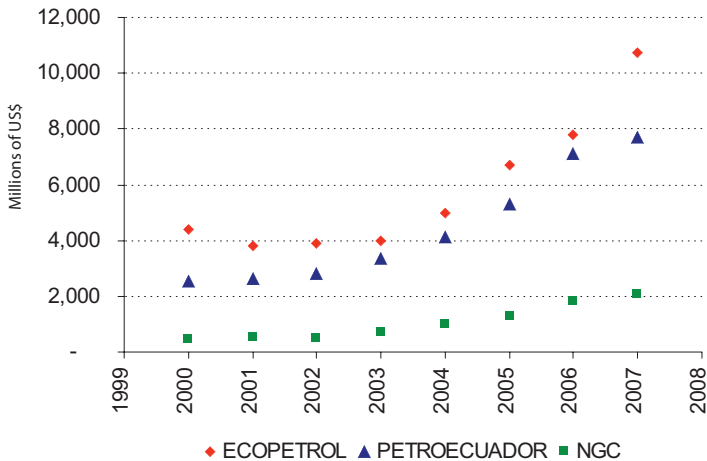
3.2.2 Medium-size Producers - Group 2

This group includes the other production companies. It is necessary to mention that it does not include the State-owned enterprises of Jamaica, Suriname and Cuba, due to the lack of publicly-available information⁴² during the period from 2000 to 2007. Figure 11: Gross Revenues

⁴² Through its Web pages.

of Medium-size Companies, shows the yearly income expressed in millions of US Dollars (US\$). Clearly the rise in oil prices over the past years was influential in doubling these companies' revenues, particularly ECOPETROL and PETROECUADOR. This fact should be taken into account when doing the respective comparative analysis, as not all of these companies have a similar size, contrary to what we see in Group 1, where all three companies studied had very similar incomes.

Figure 12: Gross Revenues of Medium-size Companies



3.2.3 Refiners and Importers - Group 3

Due to the lack of information, we only analyzed four companies in this group: PETROPERU,⁴³ RECOPE, ENAP and ANCAP.⁴⁴ Neither PETROPAR nor YPFB are included, because in the first case the available information did not allow for a complete analysis of the company (at least not at the level required for this document) and, in the case of YPFB, although it is presently beginning production activities, during the pe-

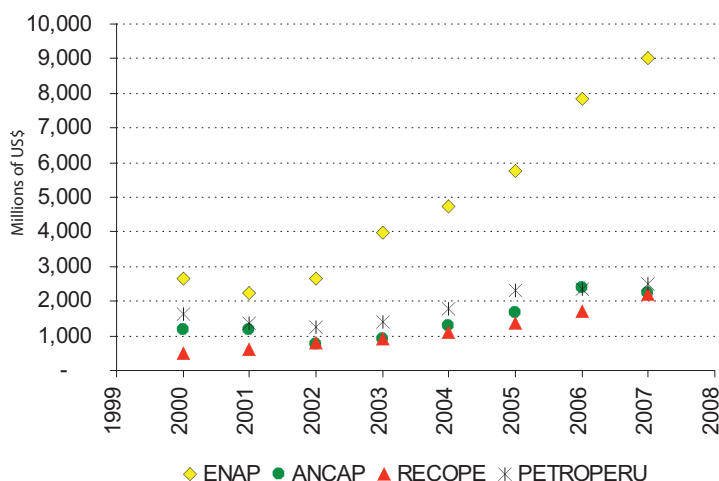
⁴³ PETROPERU does not classify as a production company, because during the study period it purchased oil for refining purposes.

⁴⁴ The data used is detailed in Annex 3 - Financial Data - Group 3.

riod 2000-2005 it had partial business activities and was devoted to managing contracts, and from 2005 to 2007 it managed the total upstream income, so the data are not entirely consistent.

As usual, the analysis starts out by comparing the evolution of each company's gross income (Figure 13: Gross Income of Importing and Refining Companies). It is clear that they all experienced growth during the review period and that in the case of ENAP, the domestic market size and its opening operations abroad caused its revenues to grow on a larger scale.

Figure 13: Gross Income of importing and Refining Companies



3.2.4 Comparative Results

This section presents a few weighted average indicators for each group, to do a comparative analysis among them. Figure 14: Comparative Analysis, shows the weighted average for the “Earnings before Taxes / Total Revenues” indicator. In the first place, note that Group 2 shows higher figures than Group 1, which is consistent with the presence of diseconomies of scale. According to this concept, the larger the scale of a company, the lower its performance will be. On the other hand, Group 3 shows a drop in this indicator due to rising international oil prices (WTI), as mentioned above.

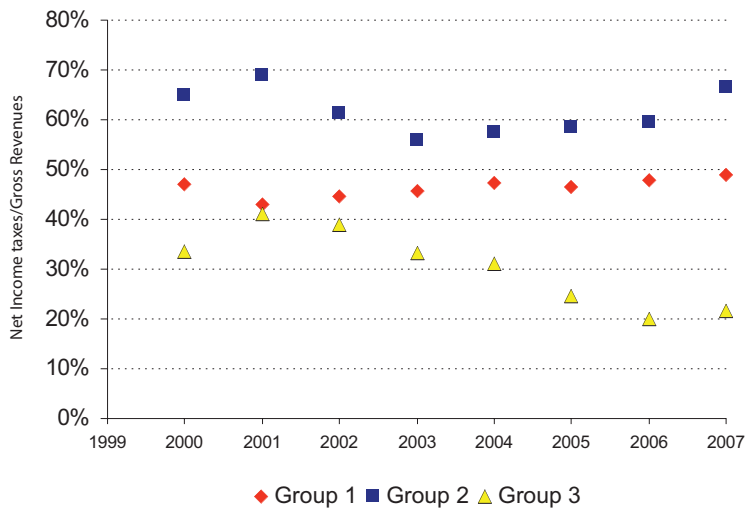
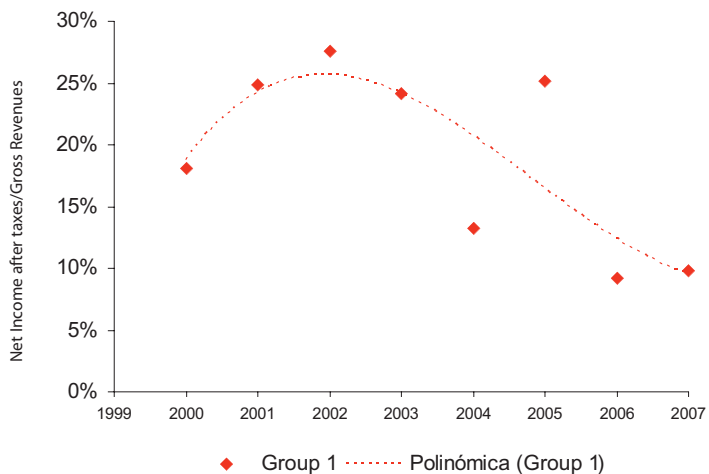
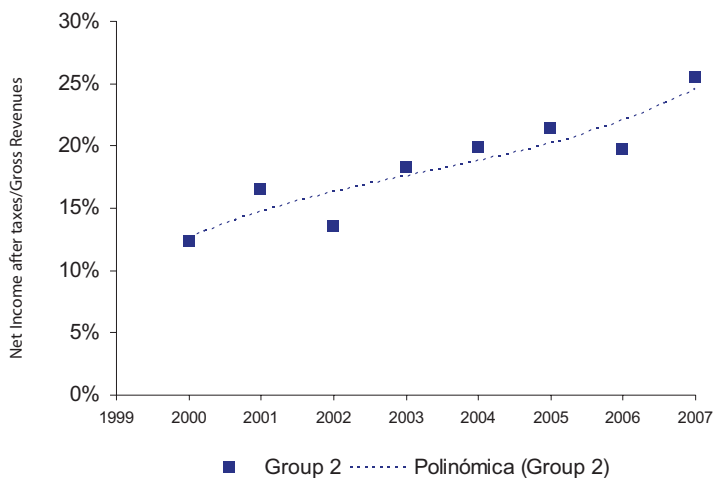
Figure 14: Comparative Analysis**Figure 15: Average earnings after Taxes - Group 1**

Figure 15: Average Earnings after Taxes - Group 1, shows the weighted average of the indicators for the case of the Group 1. This fluctuating behaviour is consistent with the theoretical analysis in the first part. According to the theoretical prediction, when prices are growing the Government has every incentive to increase transfers from the State-owned enterprise. This behaviour is clearly seen in the companies classified as Group 1. However, this is not the case for the companies of Group 2 (Figure 16: Average Earnings after Taxes - Group 2), probably because these companies are still in the process of opening markets and/or reforms within the company itself, for instance, ECOPETROL.

Figure 16: Average Earnings after Taxes - Group 2



To corroborate the above statement, Figure 17: Transfers from the State-owned enterprise and WTI Prices - Group 1 and Figure 18: Transfers from the State-owned enterprise and WTI Prices - Group 2 contrast the evolution of the “Transfers to the Government from the State-owned enterprise / Gross Revenues from Operations” indicator with the WTI prices for Groups 1 and 2, respectively. In the case of Group 1, the relationship is clear and direct, higher WTI prices come accompanied by greater transfers from State-owned enterprises to Governments. In fact, the correlation is greater by 75 %. In the case of the companies in Group 2, this relation is not evident, as the correlation is -58.3 %.

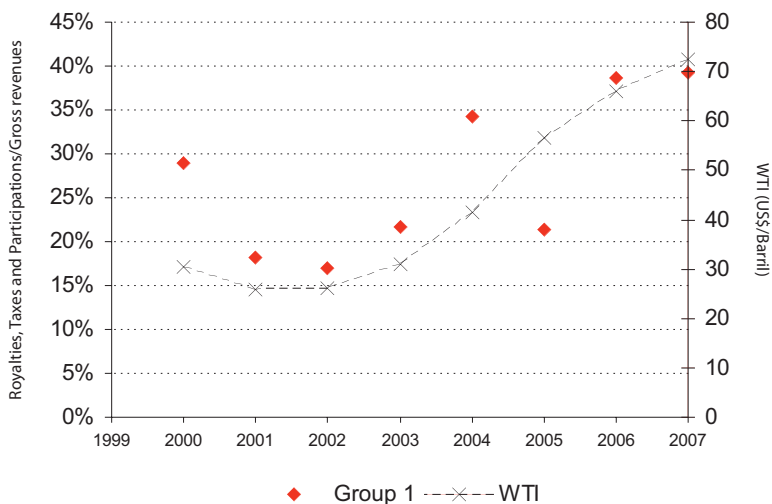
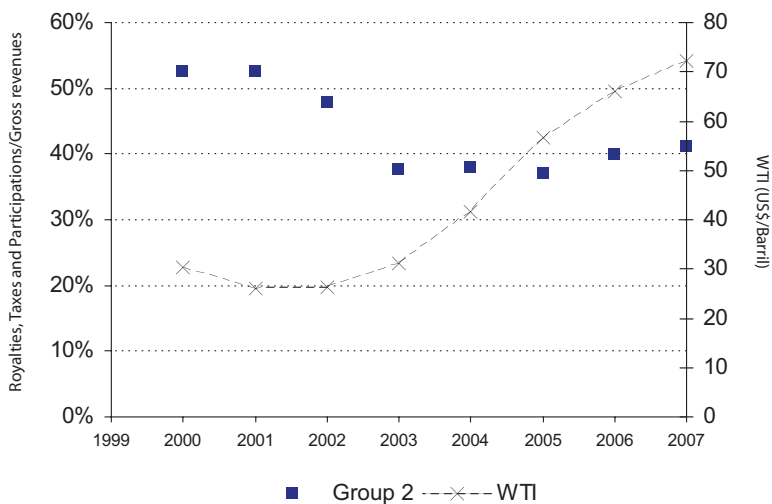
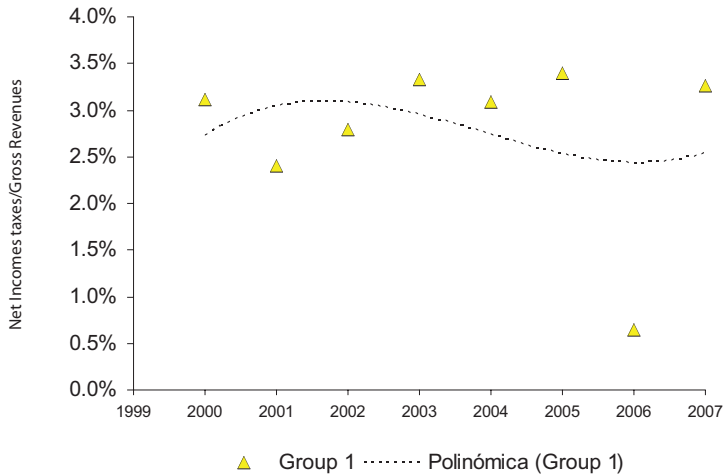
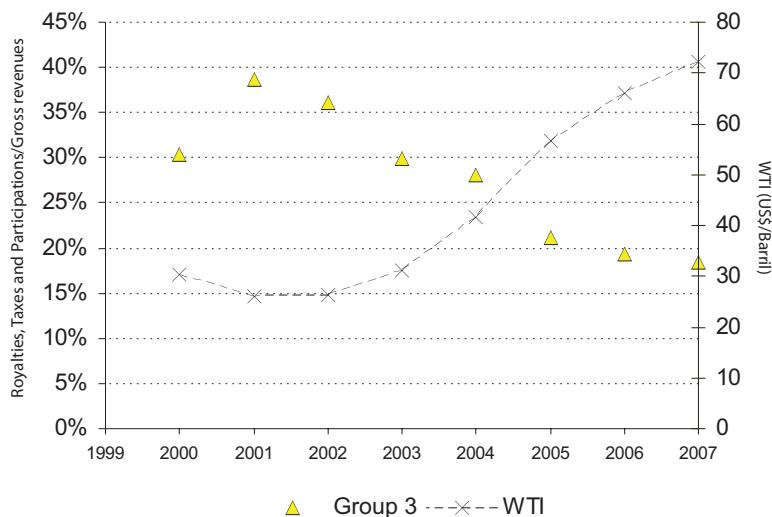
Figure 17: Transfers from the State-owned enterprise and WTI Prices - Group 1**Figure 18: Transfers from the State-owned enterprise and WTI Prices - Group 2**

Figure 19: Average Earnings after Taxes - Group 3

Finally, Figure 19: Average Earnings after Taxes - Group 3, shows weighted average indicator for the companies in Group 3. It is interesting to observe that in these times of high international oil prices, Government participation is not aggressive, and has even tended to decrease over the past years. This could confirm the hypothesis of the theoretical model, that when the Government privileges supplying the domestic market, it relaxes fiscal participation in the sector. With Figure 207: Transfers from the State-owned enterprise and WTI Prices - Group 3, we see that, in the case of companies in importing countries, the higher international oil prices were accompanied by a decrease in transfers from the State-owned enterprise to the Government, and the correlation between both variables is -95%.

Figure 20: Transfers from the State-owned enterprise and WTI Prices - Group 3

3.2.5 Conclusions of Empirical Analysis

The main conclusions for the periods reviewed in this section are:

- Based on their production and commercialization characteristics, State-owned enterprises were divided into three groups: 1) Group 1, made up of PETROBRAS, PEMEX and PDVSA; 2) Group 2 with PETROECUADOR, ECOPETROL and NGC; and 3) Group 3 with PETROPERU, RECOPE, ENAP and ANCAP. The first group contains large-scale production companies, the second group contains the other production companies with information available, and the third group clusters the oil importing and refining companies.
- Analyzing the behavior of each group with the weighted average of the “Earnings before Taxes / Gross Revenues” indicator, we see that Group 2 has higher figures than Group 1, which is consistent with diseconomies of scale. According to this concept,



the larger the size of the company, the lower its performance will be. On the other hand, in the Group 3 we see a drop in this indicator due to the rise in international oil prices.

Regarding the outcomes of Group 2, the following question would be in order: Are smaller companies more agile business-wise? Apparently, they would have greater profits. According to the Empirical Analysis, the answer would be positive, but it is necessary explore this ratio with other efficiency indicators, since this paper only used earnings before taxes.

- The earnings after taxes indicator seems to confirm the hypothesis made with the theoretical model: 1) when oil & gas sales prices rise, the Government has every incentive to increase transfers from the State-owned enterprise; and 2) when the Government privileges supplying the domestic market, Government participation in the sector relaxes.

We should say that the efficiency indicator used in this section is only one possibility in a broad array of alternatives. The findings are simply indicative and should be subjected to several additional tests and essays. However, these findings support the idea that State-owned enterprise performance is closely linked to Central Government behaviour in each country. They also help identify State-owned enterprises with a positive performance.

Evidently, the results obtained for some state companies are not good from a financial point of view; however, this analysis not considered the social investment that carry out by the companies. In fact, since they are state companies, it is not evident that the comparative analysis should be only financial, future investigation has to concentrate on the construction of an efficiency indicator for a state company.

4. Conclusions

Good Practices at a Theoretical Level

Internal Factors

- **Organizational Reforms.** It is good for a State-owned enterprise to have multiple goals, but when their priorities are confused, business management becomes difficult. Therefore, it is necessary be clear about the company's main goal.
- **Monitoring and evaluation of the performance.** The usual business performance indicators (high profits, for example) should not be the only measures taken into account, as State-owned enterprises often must reach equity goals.
- **Agency problems.** A system that separates the company from State interference is positive for public company performance. On the other hand, a system of rewards and punishments to assess manager performance generates the incentives needed to improve company efficiency. Finally, according to some authors, one of the most effective ways to improve company performance, is to include private sector representatives in it.
- **Improve financial discipline.** State-owned enterprise performance improves greatly when the State does not cover the unpaid debts of that company, thus encouraging a certain financial discipline.
- **According to some authors,** State-owned enterprise economic and financial corporatization is a policy that is necessary, but not sufficient, to prevent the interference of party politics. In fact, this should be the first step to enhancing company efficiency.

External Factors

- **Enhanced competition.** Evidently this measure cannot be implemented in the case of natural monopolies, but it is possible



in sectors where the private sector intervenes.

- Political and administrative reforms. Often the Government uses State-owned enterprises to solve problems that, in principle, are not their responsibility. In this regard, designing other types of solutions for these problems may lower its budget.
- It is desirable for a single governmental institution to control a State-owned enterprise, and we mention that an external, independent auditor should be the one to do this work.
- The Central Government can improve State-owned enterprise performance by designing a legal framework that: a) makes it possible for part of the shares to be sold to the private sector; b) applies budgetary disciplines; c) prevents complex monitoring methods; and d) establishes internationally accepted business criteria.

Good Practices in the Case Studies

- In each of the six case studies, the State-owned enterprise has a dominant market position, either because it is ensured through the applicable law or because these companies, although facing competition, have remained market leaders. However, greater flexibility and autonomy is seen the decisions made by companies having competition. Comparing this review with the empirical one in the third section, we find companies with good efficiency indicators acting in markets where competition is allowed.
- For greater flexibility in company management it should have a share package, even if 100% of the shares belong to the State. However, if there are legal norms that go against granting the company greater flexibility, it helps very little to have a share package.
- It is common to find medium and long-term expansion and investment plans approved jointly by the Treasury Department and the Ministry of Energy. However, there is a fair amount of

flexibility when executing annual plans. In fact, some companies have complete independence in designing them.

- It seems very useful for Central Governments to participate in developing State-owned enterprise plans and projects, sometimes in their capacity as partners. In this way, final approval at a more formal level does not face as many objections from the Government itself.
- There are cases where companies give bonuses (to their personnel) when meeting qualitative and quantitative goals, which helps solve the agency problem⁴⁵ mentioned in the first chapter of this work. The same applies to the labour stability generated, in the case studies, by a suitable work environment that enhances worker performance and, perhaps more importantly, ensures that medium and long term plans are implemented.

Some companies have solved the control problems mentioned in the theoretical section by promoting worker participation in collective negotiation of working conditions. In this way, salary raises or training policies are decided on following an evaluation process.

- In oil importing countries, the State-owned enterprise generally takes care of refining and distributing oil products. Therefore, when prices are on the rise (as they are now) it is good to keep fluid communication and coordination between the Treasury Department, the price regulatory agency and the State-owned enterprise. In this way, domestic oil product price adjustments harm neither company finances nor tax collection.
- In countries with crude oil import companies, it seems to be a good practice for the regulating entity to evaluate the State-owned enterprise operating and capital costs with each domestic oil product price readjustment, in order to check whether early adjustments were utilized correctly.

⁴⁵ This problem means that often staff goals are not the same as those of the company.

Conclusions of the Theoretical Model

- Utilizing the theoretical model we see that under certain standard conditions, it is optimal for the Government to apply cyclic transfer rates (from the State-owned enterprise to the Government). For example, if the Government starts to apply high transfers, it will reduce the State-owned enterprise's incentive to produce, placing domestic market supply at risk and obliging the Government to decrease transfers in the following period.
- On the other hand, if sales prices (of the State-owned enterprise) are allowed to grow, then it is possible to apply high transfer percentages and still ensure domestic market supply. From this we conclude that like any private company, will be efficient for the transfer rate from the State-owned enterprise to the Government to consistent (positive correlation) with the sales price behaviour, since the greater the price the greater the transfers, with the opposite also being valid.
- When input productivity is allowed to vary, an interesting result arises: the greater the productivity, the greater the transfer and the lower the earnings for the State-owned enterprise. From this we obtain the following hypothesis (not analyzed in this paper), that the State-owned enterprise incentive to improve its productivity is low, since this improvement is appropriated by the Government through greater transfers. Furthermore this appropriation not only eliminates earnings from production, but also captures some of the past rent. Therefore, State-owned enterprise earnings are less than in the former situation of lower productivity.
- One possibility to solve these problems is for transfers from the State-owned enterprise to the Government to be calculated on earnings from operations. This way, even should the Government impose high shares, it will not affect domestic market supply.
- When a State Company is a hydrocarbons producer and the sale oil prices is above the price used to calculate the optimal capital, then it is not optimal for the Government to vary the percentage of transfers, from the state company, significantly.

Empirical Model Findings

- Based on their production and commercialization characteristics, State-owned enterprises were divided into three groups:

1) Group 1, made up of PETROBRAS, PEMEX and PDVSA; 2) Group 2 with PETROECUADOR, ECOPETROL and NGC; and 3) Group 3 with PETROPERU, RECOPE, ENAP and ANCAP. The first group contains large-scale production companies, the second group contains the other production companies with information available, and the third group clusters the oil importing and refining companies.

- Analyzing the behaviour of each group with the weighted average of the “Earnings before Taxes / Gross Revenues” indicator, we see that Group 2 has higher figures than Group 1, which is consistent with diseconomies of scale. According to this concept, the larger the size of the company, the lower its performance will be. On the other hand, in the Group 3 we see a drop in this indicator due to the rise in international oil prices.
- The earnings after taxes indicator seems to confirm the hypothesis made with the theoretical model: 1) when oil & gas sales prices rise, the Government has every incentive to increase transfers from the State-owned enterprise; and 2) when the Government privileges supplying the domestic market, Government participation in the sector relaxes.

It is very difficult find a single model of an efficient company, since the success of a State-owned enterprise depends on the unique characteristics of the country, its markets, prices, reserves, and others. Therefore, a State-owned enterprise could take into account what other countries did based on their reality, but it is not trivial task to analyze a country’s particular characteristics to build a “tailor made” State-owned enterprise.

Good State-owned enterprise performance also results from factors that often escape the company’s control. Therefore, not only is adequate management within the company necessary, but the Central Government should also keep in mind that this production unit needs to cover its operating and capital costs. Finally, it is necessary for the Central Government to respect its agreements with the State-owned enterprise, just as it would just as it would with a private company.

The regional perspective that characterizes OLADE gave way to the comparative analysis performed in this work. It leaves it clear that the production and market differences among the countries of the region



are reflected in their State oil & gas companies; clearly the performance of integrated production companies is different from that of importing and/or refining companies. However, the relationship of broad interdependence among State-owned enterprises, Governments and States is common to most cases. Therefore, when analyzing State-owned enterprise performance, we recommend also analyzing the behaviour of the Central Government and even of civil society, and thus identifying the external and internal factors that affect the correct functioning of a State-owned enterprise.

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Annex 1: Financial Data- Group 1

Figures are expressed in millions of current US\$

PETROBRAS

YEAR	GROSS REVENUE	NET INCOME BEFORE TAXES	NET INCOME	TOTAL ASSETS	EQUITY	NUMBER OF WORKERS	EXCHANGE RATE	INFLATION	OIL PRODUCTION (Bpd)
2000	32,877	32,877	5,087	34,267	12,763	38,908	1.8	5.97%	1,445
2001	34,448	34,448	4,254	34,402	12,488	38,483	2.4	7.67%	1,516
2002	28,072	28,072	2,292	27,533	9,717	46,723	3.1	12.53%	1,695
2003	45,696	45,696	6,161	47,166	17,092	48,798	3.0	9.30%	1,483
2004	56,693	56,693	6,364	62,054	23,414	52,037	2.9	7.60%	1,431
2005	76,527	76,527	10,139	78,431	33,670	53,904	2.4	5.69%	1,604
2006	96,108	96,108	12,128	98,511	45,635	67,226	2.2	3.14%	1,691
2007	123,273	123,273	12,150	130,600	64,306	68,931	1.9	4.46%	1,707

Source: PETROBRAS.

PEMEX

YEAR	GROSS REVENUE	NET INCOME BEFORE TAXES	NET INCOME	TOTAL ASSETS	EQUITY	NUMBER OF WORKERS	EXCHANGE RATE	INFLATION	OIL PRODUCTION (Bpd)
2000	50,625	28,941	(2,117.6)	59,805.0	16,800.5	132,728.0	9.5	7.52%	3,012.0
2001	48,975	24,703	(3,650.3)	59,629.6	13,156.2	134,852.0	9.3	3.83%	3,127.0
2002	47,316	25,543	(2,960.4)	67,706.7	9,776.3	137,134.0	10.3	4.73%	3,177.1
2003	58,209	31,475	(3,765.0)	78,318.2	4,248.2	138,215.0	10.8	3.56%	3,370.9
2004	69,533	40,697	(2,259.1)	83,957.0	2,954.4	137,722.0	11.3	4.54%	3,382.9
2005	86,331	46,458	(7,002.3)	95,701.3	(2,466.5)	139,171.0	10.9	3.33%	3,333.0
2006	103,868	57,620	4,151.3	110,518.8	3,665.2	141,275.0	10.9	3.45%	3,256.0
2007	104,548	60,642	(1,685.0)	122,400.0	4,593.0	141,275.0	10.9	3.23%	3,082.0

Source: PEMEX - SENER.

PDVSA

YEAR	GROSS REVENUE	NET INCOME BEFORE TAXES	NET INCOME	TOTAL ASSETS	EQUITY	NUMBER OF WORKERS	EXCHANGE RATE	INFLATION	OIL PRODUCTION (Bpd)
2000	53,680	17,950	7,216	57,600	37,932	N.D.	679.9	16.2%	3,085
2001	46,250	11,519	3,993	57,200	37,098	N.D.	723.7	12.5%	3,094
2002	42,580	8,487	2,590	54,939	37,288	45,683	1,161.0	22.5%	2,659
2003	46,589	10,750	2,720	55,355	37,418	33,988	1,608.6	31.1%	2,451
2004	62,242	21,315	5,406	61,847	41,929	38,519	1,885.5	21.8%	2,733
2005	82,915	32,503	6,483	70,365	47,095	49,180	2,109.8	16.0%	2,846
2006	99,252	41,702	5,452	80,529	53,103	52,816	2,150.0	11.0%	2,848
2007	96,242	47,283	6,273	107,672	56,062	61,909	2,150.0	32.2%	2,841

Source: PDVSA, United States Securities and Exchange Commission.

Annex 2: Financial data - Group 2

Figures are expressed in millions of current US\$

ECOPETROL

YEAR	GROSS REVENUE	NET INCOME BEFORE TAXES	NET INCOME	TOTAL ASSETS	EQUITY	NUMBER OF WORKERS	EXCHANGE RATE	INFLATION	OIL PRODUCTION (Bpd)
2000	4,400	3,064	556	8,044	2,221	N.D.	2,088	8.75%	543,400
2001	3,794	2,964	617	9,164	2,845	7,165	2,300	7.65%	464,800
2002	3,908	2,716	533	9,719	2,898	6,623	2,508	6.99%	442,800
2003	4,005	2,527	552	9,100	3,207	6,298	2,878	6.49%	409,200
2004	4,969	3,237	804	10,648	3,808	6,027	2,626	5.50%	387,600
2005	6,684	4,561	1,402	14,075	5,725	5,856	2,321	4.85%	372,400
2006	7,799	5,506	1,438	17,870	8,836	5,498	2,358	4.48%	368,500
2007	10,746	8,475	2,493	23,152	12,900	N.D.	2,078	5.69%	326,641

Source: Central Bank of Colombia - ECOPETROL.

NATIONAL GAS COMPANY

YEAR	GROSS REVENUE	NET INCOME BEFORE TAXES	NET INCOME	TOTAL ASSETS	EQUITY	NUMBER OF WORKERS	EXCHANGE RATE	INFLATION	OIL PRODUCTION (Boe)
2000	467.1	100.4	68.3	738.7	420.7	500.0	6.300	3.60%	107,507
2001	527.7	130.2	94.9	779.2	498.2	513.0	6.231	5.50%	115,258
2002	518.6	81.2	62.0	902.9	555.5	525.0	6.247	4.20%	133,158
2003	739.0	244.2	182.9	1,092.1	711.2	535.0	6.295	3.80%	187,546
2004	989.2	342.8	237.0	1,546.4	995.5	544.0	6.299	3.70%	210,607
2005	1,273.8	415.9	280.3	2,016.9	1,175.0	552.0	6.300	6.89%	230,809
2006	1,812.1	655.8	455.1	2,941.3	1,485.1	559.0	6.312	8.30%	278,650
2007	2,074.0	828.8	608.6	3,487.0	2,054.3	599.0	6.328	7.90%	291,820

Source: The National Gas Company of Trinidad and Tobago, Central Bank of Trinidad and Tobago.

PETROECUADOR

YEAR	GROSS REVENUE	NET INCOME BEFORE TAXES	NET INCOME	TOTAL ASSETS	EQUITY	NUMBER OF WORKERS	EXCHANGE RATE	INFLATION	OIL PRODUCTION (Bpd)
2000	2,541.2	1,436.2	33.0	2,486.2	2,021.3	4,170.0	1.0	96.1%	231,858
2001 ⁽¹⁾	2,614.9	1,403.4	N.D.	N.D.	N.D.	4,005.0	1.0	37.7%	226,189
2002	2,827.9	1,334.7	N.D.	2,904.1	2,342.1	3,977.0	1.0	12.5%	219,533
2003	3,357.9	1,616.7	(61.0)	3,039.1	2,299.8	3,927.0	1.0	8.0%	203,282
2004	4,105.2	2,041.4	(89.4)	3,223.9	2,394.5	4,000.0	1.0	2.8%	196,734
2005	5,305.6	2,300.8	(14.6)	3,623.4	2,445.7	3,971.0	1.0	3.1%	194,441
2006	7,108.7	3,219.4	35.9	3,976.2	2,930.5	4,201.0	1.0	2.9%	247,775
2007	7,700.5	2,969.5	(117.3)	5,277.5	3,976.2	N.D.	1.0	3.3%	263,707

Source: PETROECUADOR.

(1) Gross Revenue and Taxes were estimated using Minimum Least Squares methods.



Annex 3: Financial Data - Group 3

Figures are expressed in millions of current US\$

PETROPERÚ

YEAR	GROSS REVENUE	NET INCOME BEFORE TAXES	NET INCOME	TOTAL ASSETS	EQUITY	NUMBER OF WORKERS	EXCHANGE RATE	INFLATION	OIL PRODUCTION (Bpd)
2000	1,631.5	321.0	24.0	669.9	47.3	1,488.0	3.490	3.7%	158,534
2001 ⁽¹⁾	1,372.5	626.2	27.6	1,316.9	23.4	1,483.0	3.508	-0.1%	155,099
2002	1,239.4	595.4	25.6	498.5	44.1	1,727.0	3.517	1.5%	157,238
2003	1,395.8	619.8	3.6	581.3	71.4	1,696.0	3.479	2.5%	153,644
2004	1,792.0	720.0	53.4	693.2	140.4	1,695.0	3.414	3.5%	165,285
2005	2,304.6	432.8	74.3	686.7	173.4	1,718.0	3.296	1.5%	158,408
2006	2,359.5	529.1	16.4	770.0	239.6	1,696.0	3.275	1.1%	153,888
2007 ⁽¹⁾⁽²⁾	2,489.7	622.4	109.8	1,269.1	451.5	1,684.0	3.129	3.9%	153,244

Source: PETROPERÚ.

(1) Taxes were estimated using Minimum Least Squares methods, with gross revenues and wti price.

(2) Sales are estimated using gross revenues and wti prices.

RECOPE

YEAR	GROSS REVENUE	NET INCOME BEFORE TAXES	NET INCOME	TOTAL ASSETS	EQUITY	NUMBER OF WORKERS	EXCHANGE RATE	INFLATION	OIL PRODUCTION (Bpd)
2000 ⁽¹⁾⁽²⁾	490.0	152.2	(7.2)	308.7	199.5	N.D.	318.3	10.3%	37,851
2001 ⁽²⁾	619.3	307.3	15.1	317.7	212.4	N.D.	341.9	11.0%	39,302
2002	808.4	336.2	23.2	355.0	227.5	N.D.	379.1	9.7%	41,744
2003	921.7	359.5	21.0	357.4	237.8	N.D.	419.0	9.9%	41,052
2004	1,104.3	401.1	44.5	376.7	282.5	N.D.	459.6	13.1%	41,896
2005	1,376.5	359.5	4.7	459.9	271.6	N.D.	497.7	14.1%	43,599
2006	1,720.6	424.4	12.4	520.9	290.5	N.D.	520.0	9.4%	45,538
2007	2,191.7	641.3	88.5	736.6	397.4	N.D.	497.2	10.8%	46,398

Source: RECOPE.

(1) Taxes were estimated using Minimum Least Squares methods with gross revenues and wti price.

(2) Sales are estimated using gross revenues and wti prices.

(e) Estimated with august-december data.

ENAP

YEAR	GROSS REVENUE	NET INCOME BEFORE TAXES	NET INCOME	TOTAL ASSETS	EQUITY	NUMBER OF WORKERS	EXCHANGE RATE	INFLATION	OIL PRODUCTION (Bpd)
2000	2,635.97	991.23	88.96	2,289.95	756.83	3,201.00	539.5	3.8%	201,077
2001 ⁽¹⁾	2,253.24	873.50	62.30	1,944.80	673.90	3,061.00	634.9	3.6%	194,783
2002	2,639.02	898.66	81.91	2,154.30	655.03	3,036.00	694.7	2.5%	219,900
2003	3,991.47	1,069.12	147.96	2,572.31	725.61	3,090.00	687.5	2.8%	227,200
2004	4,724.91	1,228.22	116.82	2,967.76	758.18	3,067.00	614.0	1.1%	235,300
2005	5,747.12	1,535.23	197.84	3,671.50	919.20	2,979.00	559.8	3.1%	261,368
2006	7,824.00	1,452.82	50.80	5,440.50	989.60	2,916.00	530.3	3.4%	271,300
2007	9,019.00	1,671.72	49.63	3,805.00	938.90	3,298.00		4.4%	290,300

Source: ENAP.

(1) For 2000-2004, the specific gasoline and diesel taxes were estimated with SII-Chile data.

(1) For 2005-2007, the specific gasoline and diesel taxes were estimated with ENAP data.

ANCAP

YEAR	GROSS REVENUE	NET INCOME BEFORE TAXES	NET INCOME	TOTAL ASSETS	EQUITY	NUMBER OF WORKERS	INFLATION	SALES (Bpd)
2000	1,174.4	410.2	30.4	532.5	419.9	2,784	4.8%	32,932
2001 ⁽¹⁾	1,173.6	368.9	7.0	551.2	379.7	2,699	4.4%	28,703
2002	762.4	232.6	17.5	542.6	314.7	2,423	14.0%	26,349
2003	903.0	201.6	19.8	628.6	348.0	2,279	19.4%	25,105
2004	1,284.7	308.5	49.2	730.3	457.2	2,153	9.2%	30,532
2005	1,657.2	326.6	61.5	869.8	546.2	2,118	4.7%	29,562
2006	2,369.6	404.3	5.5	1,327.7	766.3	2,248	6.4%	34,930
2007 ⁽¹⁾⁽²⁾	2,243.3	372.5	37.2	1,416.3	803.1	2,359	8.1%	32,939

Source: ANCAP, General office of Energy and Nuclear Technology - Ministry of Industry, Energy and Mining, CEPAL.

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