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Regulatory Governance in the Brazilian Oil Sector: Passport to the Future or Passage to the Past?

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**A thesis submitted to the School of Law, university of
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GLOSSARY OF TERMS AND ABBREVIATIONS

ANEEL: Agencia Nacional de Energia Eletrica – Brazilian National Electricity Power Agency.

ANP: Agencia Nacional do Petroleo - Brazilian National Petroleum Agency.

BNDES: Banco Nacional de Desenvolvimento Economico e Social – Brazilian Bank for National Economic and Social Development.

CAPEX: Capital Expenditures.

CIA: Central Intelligence Agency

CNOOC: Chinese National Offshore Oil Corporation.

CNPE: Brazilian National Council for Energy Policy.

CVP: Corporacion Venezolana de Petroleo.

FPSO: Floating Production, storage and offloading.

GDP: Gross Domestic Product.

IBP: Instituto Brasileiro do Petroleo – Brazilian Petroleum Institute.

ICC: International Chamber of Commerce.

IEA: International Energy Agency.

IMF: International Monetary Fund.

IOCs: International Oil Companies.

MME: Ministerio das Minas e Energia – Brazilian Ministry of Mines and Energy.

MPE: Norwegian Ministry of Petroleum and Energy.

NIOC: National Iranian Oil Company.

NNPC: Nigerian National Petroleum Corporation.

NOCs: National Oil Companies.

NPD: Norwegian Petroleum Directorate.

OPEC: Organisation of the Petroleum Exporting Countries.

PDVSA: Petroleos de Venezuela – Venezuelan National Oil company.

PFL: Partido da Frente Liberal.

PPSA: Pre-Sal Petroleo S.A.

PSDB: Partido Social Democrata Brasileiro – Brazilian Social Democratic Party.

PT: Partido dos Trabalhadores – Brazilian Worker’s Party.

SDFI: State Direct Financial Interest.

TCU: Brazilian General Accounting Office

UN: United Nations.

YFP: Yacimientos Petroliferos Fiscales.

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To my supervisors Kathryn and George, for the essential guidance, support, kindness and for the availability to help me in the most difficult situations.

Above all, to God, for the lit candlelight, showing the direction throughout the moments of darkness.

DECLARATION

The candidate acknowledges that this thesis is the author's work. Some of the work arising from this research have been published or submitted for publication prior to the submission of this thesis:

- 1) Pedro de Abreu e Lima Florencio, 'Supreme Court Decisions with Regard to the Brazilian Oil Sector' (2013) *International Energy Law Review* 18;
- 2) Pedro Florencio, Virendra Chauhan and Maarten van Mourik, 'Challenges across Brazil's oil sector and prospects for future production' *The Oxford Institute for Energy Studies Paper WPM 55* <<https://www.oxfordenergy.org/2014/10/challenges-across-brazils-oil-sector-and-prospects-for-future-production/>> accessed 29 June 2015.¹

Yet none of this material has been published or submitted for publication prior to the commencement of the candidate's period of study.

The candidate acknowledges that this work has not been submitted previously for a degree at this or any other institution.

¹ The author's contribution was in the description and analysis of the Brazilian legislation.

ABSTRACT

This thesis examines the current Brazilian oil sector's institutional and regulatory governance structure and its impact on four variables: investment, production, technology - innovation and the strategic control of oil. These variables are fundamental for the development of the oil industry and they are mentioned in Brazilian laws as central aspects to be continually developed. A prospective analysis of the 2010 reform in the Brazilian oil regulatory framework is a major part of the thesis because the alterations are relatively recent and have not as yet produced a set of consistent and statistically significant data.

The research adopts a multidisciplinary perspective, using the institutional, reflexive and responsive theoretical frameworks and a methodology based on the examination of the legislation, semi-structured interviews and a historical comparative study of international regulatory governance in the oil sector to draw two main conclusions.

First, the new Brazilian regulatory framework will have significant drawbacks in three of the four variables: investments, production and technology-innovation, essentially because of its excessively interfering and rigid approach, based on command and control regulations. Second, despite allowing an increasing strategic control over oil in some specific situations, this goal could have been attained in a manner that would have avoided the shortcomings in the other variables.

Based on this understanding, the thesis makes recommendations to overcome the identified drawbacks. In line with the responsive and reflexive conceptual frameworks, the proposals consider that regulations in a dynamic and changeable sector as the oil industry should avert intrusiveness and imperative commands. They should rather advocate a versatile and interactive regulatory approach, steering and guiding the different stakeholders to socially desirable outcomes.

PART I - LEGAL AND THEORETICAL FOUNDATIONS FOR THE ANALYSIS

1 - INTRODUCTION

The date was symbolic, the 7th of September of 2008, Brazil's independence day, commemorating the country's break with Portugal, 186 years earlier. A former union leader from the poor north-eastern part of the country who had become the first Worker's Party President of Brazil now delivered a poetic opening message: "Fortunate is the nation that can look with pride to its past and with hope to its future..."²

Lula, the charismatic Brazilian President from 2003 to 2011, continued his speech in an almost messianic tone: "I had the privilege of glimpsing this future in the open sea of Espírito Santo's coast. I saw with my very own eyes and felt with my bare hands, at Platform 34 of our cherished Petrobras, the oil that has started to flow from the pre-salt."³ With a prophetic air, he then enthusiastically announced: "The pre-salt is a passport to the future!"

The statement made front-page news the following day. Photos of President Lula holding up his nine fingered hands blackened with pre-salt oil soon dominated the Brazilian media.⁴

His gesture was highly symbolic. It echoed President Vargas when, 56 years earlier, in a campaign for the creation of the Brazilian national oil company, he had proudly showed to Brazilians that they could indeed produce their own oil, despite pessimistic predictions forecasting otherwise. Lula also sent a message to the world of his government's

² Luiz Inacio Lula da Silva, *Pronunciamento à nação do Presidente da República, Luiz Inácio Lula da Silva, em cadeia nacional de rádio e TV, por ocasião das comemorações do Dia 7 de Setembro* (Presidency of the Federative Republic of Brazil 2008) available at: <<http://www.biblioteca.presidencia.gov.br/ex-presidentes/luiz-inacio-lula-da-silva/discursos/2o-mandato/2008/2o-semester/07-09-2008-pronunciamento-a-nacao-do-presidente-da-republica-luiz-inacio-lula-da-silva-em-cadeia-nacional-de-radio-e-tv-por-ocasio-das-comemoracoes-do-dia-7-de-setembro/view>> accessed 15 September 2014.

³ Ibid.

⁴ President Lula lost one of his fingers when he worked as a press operator in an automobile factory.

accomplishments. Most importantly, however, he implicitly announced that oil exploration in Brazil would thereafter have his hands on it, his stamp, his direction.

The prospects were encouraging indeed. Pre-salt offshore reservoirs, which span an area of 149,000 square kilometres 4 to 6 miles below sea level, underneath 2,000 metres of thick layers of salt, would place Brazil among the countries with the biggest reserves on the planet.⁵ The Brazilian national oil company, Petrobras, was certainly in the best position to exploit it. It had been breaking successive production and technological records and its soaring shares placed it amongst the 12 largest companies in the world by market capitalisation.⁶

President Lula claimed that the exceptionally favourable conditions of the massive pre-salt oil discoveries required an urgent change in Brazilian oil regulations, given the leading role that the oil sector was expected to have in the country. Its GDP share had already grown from 3% in 1998 to 12% in 2007. Forecasts pointed to a further increase to 20% by 2020.⁷ Oil would most certainly assume central strategic importance for Brazil and management, control and governance of its industry would gain relevance accordingly. Brazil's increasing international prominence as a leading emerging market also made this economic shift worthy of international concern for its global repercussions.

In 2010 the government promoted several statutory changes in the Brazilian oil sector, with the primary aims of achieving increasing governmental strategic resource control and ensuring that future Brazilian generations could share the benefits from the discovery of these oil reserves. The new regulatory regime reversed the previous trend towards market reforms and instead increased regulatory interference in the Brazilian oil sector. It allegedly vested strategic control of oil endowments in the state and shifted the contractual method from a

⁵ Oxford Analytica, 'The Impact of Pre-Salt: A Long-Term Perspective' (A Report Prepared for PETROBRAS, 2010) 4.

⁶ Amrita Sen and others, 'Brazil's Struggles' Energy Aspects - In Focus <<https://www.energyaspects.com/publications/view/brazils-struggles>> accessed 15 June 2015 4.

⁷ Edmar Luiz de Almeida and Vinícius Accurso, 'Government take e Atratividade de Investimentos na Exploração e Produção de Hidrocarbonetos no Brasil' Discussion Paper 02/2013 - Grupo de Economia da Energia <http://www.gee.ie.ufrj.br/index.php/component/cck/?task=download&file=textos_discussao_arquivo&id=452> 3.

concession agreement to that of production-sharing with operational exclusivity. Statutory provisions established a social fund for the distribution of the proceeds from oil production.

The state oil company, Petrobras, in turn, started facing successive regulatory challenges, which thereafter impacted on its profitability. These challenges included government subsidies and price controls, as well as strict “local content” rules that required it to enter into supply contracts with Brazilian companies.

Unlike most other sectors, such as macroeconomics, where there has been a continuity of policies between President Lula and his predecessor, in regulated sectors there has been a noticeable shift.⁸ The changes vested increased planning and formulation functions in entities directly linked to the Presidential office, relegating sectoral agencies with typical regulatory functions. The modifications in the oil sector have been more acute and interventionist if compared with other regulated sectors, especially since 2010.⁹

Six years after President Lula’s historic speech, the prospects of the oil sector are not looking favourable. Five years have lapsed without public tenders and in the pre-salt’s first auction only 11 companies registered and one bid was made. Petrobras’ annual output has dropped in 2012 and 2013.¹⁰ It is considered the most highly indebted oil company in the world and its shares have lost a fifth of their value, as of April 2014, compared to the time when the pre-salt discovery was announced.¹¹ The mismatch between initial forecasts, in 2008, and the

⁸ Cf. Bruno Conde Caselli, ‘Redesenho institucional e arranjos contratuais: Uma análise da regulação e da indústria de petróleo e gás natural no upstream brasileiro’ (Dphil thesis, Universidade Federal do Rio de Janeiro 2012); and Edmar Lisboa Bacha and Regis Bonelli, ‘Uma interpretação das causas da desaceleração econômica do Brasil’ (2005) 25 Revista de economia política 163, referred in Luiz Marcelo Martins Almeida, Luiz Alberto Nascimento Campos filho and Lourdes Casanova, ‘The Brazilian Institutional Environment: The Impact on Companies’ Strategies in the Oil and Gas Sector’ (2011) Faculty and Research Working Paper - INSEAD.

⁹ Cf. M Tina Dacin, Christine Oliver and Jean Paul Roy, ‘The legitimacy of strategic alliances: An institutional perspective’ (2007) 28 Strategic Management Journal 169 and W Richard Scott, *Institutions and organizations* (Sage 2001) referred in Luiz Marcelo Martins Almeida, Luiz Alberto Nascimento Campos filho and Lourdes Casanova, ‘The Brazilian Institutional Environment: The Impact on Companies’ Strategies in the Oil and Gas Sector’ (2011) Faculty and Research Working Paper - INSEAD 25.

¹⁰ <http://www.petrobras.com/en/magazine/post/2013-net-income-of-r-23-57-billion.htm/> accessed 18 August 2014.

¹¹ The company’s shares dropped significantly further after a corruption scandal affected Petrobras at the end of 2014. The statistic has been intentionally left to a period prior to the corruption scandal to show the influence of other factors in the plunge. Cf. Amrita Sen and others, ‘Brazil’s Struggles’ Energy Aspects -

current reality has cast doubts over the design of the Brazilian oil regulatory framework and its capacity to contribute to the country's development.

This thesis examines such key changes in the oil sector's regulatory framework in Brazil since the discovery of pre-salt reservoirs, in 2007. The main research aim is the assessment of the new institutional and regulatory governance structures from the perspective of regulatory theory and the impact of the current regulations on four key variables: investment, production, technology-innovation and strategic control of oil. These four variables are fundamental to the long lasting development of the oil industry¹² and they are mentioned throughout Brazilian laws as central elements to be fostered and continually improved.¹³

The analysis primarily focuses on the upstream segment.¹⁴ Investments here are considered according to the classical economic terminology as the sum of inventories' variation with gross fixed capital formation directed to the oil industry. Technology and innovation are understood in their broadest sense as the amount of specialised scientific knowledge and expertise, which accrue to future increases of production levels. Production, in turn, is the amount of oil barrels produced at the upstream level. The focus will go far beyond mere production level estimates, concentrating instead on the institutional mechanisms and factors that affect production and on elements that induce or hinder it. The analysis of the strategic control of oil considers the possibility of greater influence over the production process and towards the appropriation of wealth coming from the exploration of oil activities. This was the connotation given by government officials to the term "strategic control" when proposing the

In Focus <<https://www.energyaspects.com/publications/view/brazils-struggles>> accessed 15 June 2015 4.

¹² Cf. Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); Nadeja M Victor, 'On measuring the performance of national oil companies (NOCs)' (Program on Energy and Sustainable Development: Working Paper # 64, 2007); Daniela Couto Martins, *A Regulação da Indústria do Petróleo: segundo o modelo constitucional brasileiro* (Fórum 2013); and Luiz Cezar Quintans(ed), *Contratos de Petróleo Concessão e Partilha Propostas e Leis para o Pre-Sal* (B. Biz Editores 2011).

¹³ Cf. Chapter I, Art.1 of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997).

¹⁴ The upstream segment comprises the phases of exploration and production. Cf. Gavin Bridge and Philippe Le Billon, *Oil* (John Wiley & Sons 2013) 37.

2010 reforms.¹⁵ By doing so, the aim is to analyse whether or not regulations contribute to this increasing strategic control of oil, in line with the government's intention in 2010.

A discussion of the 2010 reforms in the Brazilian oil regulatory framework forms a major part of the thesis through a prospective analysis because the alterations in the oil framework are relatively recent and have not as yet produced a set of consistent and statistically significant data.¹⁶ Based on the inferences of the initial chapters, the final part of the thesis makes specific policy proposals with a view to enhancing the oil sector's regulatory governance and its contribution to the country's development.

The thesis advances two main arguments. First, the current regulatory governance setting will have significant drawbacks for the country in terms of investments, production and technology – innovation. Secondly, despite potentially contributing towards an increasing strategic control of oil and its income, this achievement comes at a significant price for the country, a price that could have been avoided with minor legal changes, which are detailed in chapter 5. The drawbacks pointed out in the thesis are seen to derive essentially from a top-down regulatory approach disproportionately dependent on interventionist command and control procedures. It is argued that a less intrusive regulatory standpoint using reflexive and responsive regulations would be more appropriate in such a dynamic and mutable sector because these approaches attempt to direct and influence stakeholders towards a certain desirable outcome, indicating the direction, but without interfering excessively in the procedures and the content of their activities.¹⁷

Of course there are several other aspects that influence the variables studied in the thesis that will not be taken into account. Four important facets will only be tangentially

¹⁵ According to the Interministerial Exposition of Motives N. 38 – MME/MF/MDIC/MP/CCIVIL, 31 of August 2009. Available at <http://www.planalto.gov.br/ccivil_03/projetos/expmotiv/emi/2009/38%20-%20mme%20mf%20mdic%20mp%20ccivil.htm> accessed 13 October 2013.

¹⁶ Only one bidding round has been organised in Brazil after the 2010 reform.

¹⁷ Cf. Gunther Teubner, *Law as an autopoietic system* (Oxford/Cambridge, Blackwell Publishers 1993); John Paterson, 'Reflecting on Reflexive Law' in Michael King and Chris Thornhill (eds), *Luhmann on Politics and Law: Critical Appraisals and Applications* (Hart Publishing 2006); Ana Lourenço, 'Autopoietic Social Systems Theory: The Co-Evolution of Law and the Economy' (2010) 35 *Australian Journal of Legal Philosophy* 35; and Ian Ayres and John Braithwaite, *Responsive regulation : transcending the deregulation debate* (Oxford University Press 1992).

addressed: i) government take;¹⁸ ii) oil prices; iii) the shift to fossil replacement; and iv) corruption. The first reason for this omission is that a considerable amount of detailed studies and reports have been made on these topics in the area of accounting, business, economics and engineering, with respect to the first three aspects, and in sociology and political science, considering the last one. The second motive is that this thesis focuses on broader institutional, political and socio-economic aspects of regulatory governance beyond fiscal revenues, prices, fossil fuel replacement and corruption. Despite not specifically analysing these topics they are pinpointed throughout the chapters whenever necessary to provide a better understanding of the impact on the analysed variables.

The next part of this introduction, section 1.2, explains why the thesis is relevant and how it is expected to fulfil a significant academic gap in the field, providing useful tools for policy proposals in an essential sector for the future of Brazil. Section 1.3 then addresses the methodological framework used in the thesis and further elaborates the research question. The fourth and last part describes the thesis' organisation, outlining the main issues in each chapter and advancing the most important conclusions.

1.2 RELEVANCE OF THE RESEARCH

This thesis is relevant for several reasons. The discovery and exploitation of Brazil's pre-salt oil layers in 2007 inaugurates a new development pattern for the country, heavily and closely associated with a robust oil industry. Sources estimate that the oil and gas sector may account for a fifth of Brazil's GDP in 2020 while in June 2014 it represented 13%.¹⁹ In view of the expected importance of this industry in Brazil, it is essential to provide for the best use of

¹⁸ Government take is a terminology used in oil literature that designs all taxes and state appropriations of the oil production.

¹⁹ Cf. Portal Brasil 'Setor de petróleo e gás chega a 13% do PIB brasileiro' <<http://www.brasil.gov.br/economia-e-emprego/2014/06/setor-de-petroleo-e-gas-chega-a-13-do-pib-brasileiro>> accessed 08 June 2015.

the country's oil endowment so it can actually become a "passport to the future", as stated by President Lula.²⁰

Until the present time, technical discussions and intellectual production related to the regulation of the Brazilian oil sector have revolved around three main avenues. The first avenue essentially stresses the macroeconomic repercussions of Brazil as a major economic powerhouse and commodity-exporting country. It mostly focuses on the manufacturing sector's competitiveness deterioration, as a result of the "Dutch disease" or the "resource curse",²¹ sometimes also referred to as the "paradox of plenty theory".²² The second avenue is mainly concerned with government revenue or, in other words, how the oil industry's income will be appropriated by the state at the federal level - through government participation in production - and further distributed to subnational entities.²³ The third attributes utmost priority to the analysis of the increased state ownership and control over strategic resources and their use to exert influence to bring about the construction of a robust industry in the oil supply chain.²⁴

²⁰ Author's translation of Luiz Inacio Lula da Silva, Pronunciamento à nação do Presidente da República, Luiz Inácio Lula da Silva, em cadeia nacional de rádio e TV, por ocasião das comemorações do Dia 7 de Setembro (Presidency of the Federative Republic of Brazil 2008) available at: <<http://www.biblioteca.presidencia.gov.br/ex-presidentes/luiz-inacio-lula-da-silva/discursos/2o-mandato/2008/2o-semester/07-09-2008-pronunciamento-a-nacao-do-presidente-da-republica-luiz-inacio-lula-da-silva-em-cadeia-nacional-de-radio-e-tv-por-ocasio-das-comemoracoes-do-dia-7-de-setembro/view>> accessed 15 September 2014.

²¹ Cf. Macartan Humphreys, Jeffrey Sachs and Joseph E Stiglitz, *Escaping the resource curse* (Cambridge University Press 2007).

²² Cf. Luciano Losekann and Thiago Periard, *Projecoes do Pre-sal: O Brasil sera um petro-estado?* (Blog Infopetro 2013); Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); and Francesco Caselli and Guy Michaels, 'Do oil windfalls improve living standards? Evidence from Brazil' National Bureau of Economic Research Working Paper N 15550 accessed 18 May 2015.

²³ Cf. Guilherme Dias and Alfredo Renault, 'A concentração de recursos na União e as perdas das regiões produtoras' in Fabio Giambiagi and Luiz Paulo Vellozo Lucas (eds), *Petroleo Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2013); Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); Paulo César Ribeiro Lima, *Pré-sal, o novo marco legal e a capitalização da Petrobras* (Synergia Editora 2011); and Edmar Luiz de Almeida and Vinícius Accurso, 'Government take e Atratividade de Investimentos na Exploração e Produção de Hidrocarbonetos no Brasil' Discussion Paper 02/2013 - Grupo de Economia da Energia <http://www.gee.ie.ufrj.br/index.php/component/cck/?task=download&file=textos_discussao_arquivo&id=452> .

²⁴ Cf. Marilda Rosado de Sá Ribeiro, 'Sovereignty over Natural Resources Investment Law and Expropriation: The case of Bolivia and Brazil☆' (2009) 2 Journal of world energy law and business 129; Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); Eloi Fernandez e Fernandez, 'Industria nacional de bens e servicos nos arranjos produtivos do setor de oleo e gas natural no Brasil' in Fabio Giambiagi (ed), *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Brasil 2013); Eduardo Augusto Guimaraes, 'Uma

Little attention has been given until now to an objective study of the current regulatory governance of the oil sector in Brazil and how this setting affects essential variables for the development of the oil industry and the country as a whole from a legal, economic and social perspective.²⁵ Effective regulatory governance contributes to an appropriate legal and socio-economic environment to extract the maximum benefit from the newly discovered resources for the country's development. This policy pillar has been rather neglected so far. The thesis aims to fill this gap.

Finally, and most importantly, this thesis' findings provide useful inputs for policy proposals and future assessments of regulatory governance in the oil sector in a more objective manner. Rather than providing partisan and dogmatic answers, the hope is to open further questions and promote additional debates in a more constructive, pragmatic and policy-driven way.

1.3 METHODOLOGICAL CONSIDERATIONS

This thesis adopts a multidisciplinary approach. The perspective derives from the very nature of its central issue – regulatory governance in the oil sector, which transcends the realm of Law, thus requiring a more comprehensive, multidisciplinary treatment, in line with this methodological proposal.²⁶

As already mentioned, regulatory governance will be mainly studied through its effect upon four key variables. The analytical methodology for the study is conducted in three main ways. First, it examines the oil sector's governance regulatory aspects in primary materials of statutes, rules and in the informal interface between institutions. The examination assesses the

avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Edmar Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013); and Oystein Noreng, 'Brazil and Norway- Offshore Petroleum Experiences and Lessons' (2009) 35 *Journal of Energy and Development* 79.

²⁵ One notable exception, discussed in the course of this thesis, is the study performed by Adriano Pires and others. Cf. Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Fabio Giambiagi and Luiz Paulo Vellozo LUCAS eds, Elsevier Brasil 2013).

²⁶ Cf. Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013) 29.

interplay and interaction of institutional agents and what are the underlying incentives and disincentives provided by legal provisions, formal and informal norms.

Most of the theoretical framework for this analysis stems from institutional theories in economics and political science. As will be detailed throughout the thesis, these theories consider that firms and socio-economic agents react and build their strategies according to their respective institutional environment.²⁷ The essential understanding is that the institutional setting shapes the regulatory governance structure, which, in turn, influences companies' strategies and their outcomes.²⁸ One of the main benefits of this approach is its comprehensiveness, since it considers legal norms as one among several institutions establishing basic rules and procedures for the relationships between and within corporations and organisations.²⁹ The approach also attributes special importance to elements such as history and culture and how they affect institutions throughout time.

The second methodological approach is a qualitative research perspective based on a series of semi-structured interviews with groups of oil experts. The following groups of specialists are interviewed: i) current and former government officials; ii) top executives in international and national oil firms; iii) legal advisors; and iv) academic researchers and university professors. The goal of this qualitative research is to assess each group's view on the regulatory governance of the Brazilian oil sector and how its elements, mechanisms and specificities affect the studied variables.

Thirdly, the thesis also uses a historical and comparative method. It conducts an international comparative study of oil regulatory governance in other countries, evaluating their experiences and what their influences upon development of the oil sector have been. This

²⁷ Cf. Douglass C North, *Institutions, institutional change and economic performance* (Cambridge university press 1990); and Douglass C North, 'Economic performance through time' (1994) *The American economic review* 359.

²⁸ David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 888.

²⁹ Avner Greif provides a good definition about institutions: "An institution is a system of social factors that conjointly generate a regularity of behaviour. Each component of this system is social in being man-made, non-physical factor that is exogenous to each individual whose behaviour it influences." Cf. Avner Greif, *Institutions and the path to the modern economy: Lessons from medieval trade* (Cambridge University Press 2006) 30. This topic will be further explored throughout the thesis.

comparative study initially provides an international overview of oil regulatory frameworks but later brings its focus to bear upon Norway.

Norway has a historical reputation for successful oil exploitation and is considered as an international benchmark by specialists when it comes to oil regulatory governance.³⁰ Oil exploitation in this country has already reached the maturity phase, which means that it has passed through distinct stages of oil exploration, making the study of its oil policies in different moments of history particularly enriching and valuable for Brazil.

As already stated, a considerable part of the analysis conducted in the thesis is prospective, since a major change in the Brazilian oil regulatory framework occurred in 2010 and the influence of this modification upon the variables here considered has not yet produced a statistically significant set of data. Interviews with specialists prove very useful here, to grasp the actual tendencies and possible future outcomes of the changes, including potential difficulties. The international comparison complements the examination, by seeking to understand whether the anticipated outcomes have been observed elsewhere and how have they been dealt with in other jurisdictions.

As is frequently the case in social sciences, the thesis does not establish an unquestionable causal relationship between the oil sector's regulatory governance setting and the suggested outcomes. A conclusion of this sort would require a quantitative study through a multivariate regression model, whereby regulatory provisions and hypotheses could be tested and measured using data results. This exercise would be very difficult to perform for two main reasons.

First, regulatory governance aspects with their specificities and nuances are difficult to build into a quantitative model with any reasonable degree of precision, especially because they often involve important informal elements. Second, there is not yet a significant amount of

³⁰ Cf. Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 231, 235; Baker Institute, 'Baker Institute Policy Report' (The Changing Role of National Oil Companies in International Energy Markets, 2007); and David R. Hults, Mark C. Thurber and David G. Victor, *Oil and governance : state-owned enterprises and the world energy supply* (Cambridge University Press 2012).

observations of the variables here studied since the enactment of the most recent change to the oil regulatory framework in 2010. As no clear quantitative causal relationship may be established at this stage, the qualitative methodological approach seems to be the most appropriate.

Therefore, this thesis uses existing available data, semi-structured interviews and comparative international evaluations to make a critical assessment of the current regulatory framework in the Brazilian oil sector. It examines the effects of this segment's regulatory governance setting on the studied variables and evaluates to what extent these effects contribute to the economic development of the sector. The last part of the thesis makes specific policy proposals on how to enhance the current regulatory governance setting.

1.4 ORGANISATION OF THE THESIS

The thesis is organised in three main parts and 10 chapters. The first part - Legal and theoretical foundations for the analysis – provides the necessary framework for the study, discussing central theories, describing the main institutions in the Brazilian oil sector and also the international experience in oil regulation. It is comprised of four chapters, including this introduction as Chapter 1.

Chapter 2 examines the history of state intervention in Brazil, contrasting it to the international context and demonstrating how this evolution has shaped the regulation of the oil sector, and, most specifically, the institutions that today form its industry. Three special moments assume particular importance: 1988, 1995, and 2010.

The year 1988 was a landmark in Brazilian political history with the enactment of a new Federal Constitution – the first under democratic rule after 21 years of military regime from 1964 to 1985. In the oil sector, it consolidated state monopoly and sovereignty over natural resources.

1995 was a turning point in the Brazilian contemporary economic trajectory. Market oriented reforms were inaugurated, including amendments with respect to the oil monopoly. Sweeping transformations were introduced in Petrobras. Modern managerial strategies brought innovation to an enterprise well-endowed with human resources (high-level engineers and researchers) but blocked with burdensome bureaucratic procedures. Financial advancements opened the company's shares to the private sector, which started being negotiated in main stock markets in advanced economies.³¹ Nowadays Petrobras is a state-controlled company whose governmental shares amount to 55,6 % of the voting shares.³²

2010 marked a paradigm shift in oil sector regulation because of the implementation of three laws that reformed the industry, asserting increasing state control over oil reserves and future production.

Chapter 3 discusses regulatory theories focusing on the institutional, responsive and reflexive conceptual frameworks and how they are specifically applied to the oil sector and to the Brazilian context in particular. The principal goal of chapter 4 is to analyse international experiments in regulation of the oil sector to extract useful lessons and experiences for Brazil. It portrays some relevant features of international experience in regulation of the segment and how they have affected each country's development. The first part of the chapter gives a global overview while the second one focuses on Norway.

Part II of the thesis concentrates on the analysis of how the current regulatory governance of the Brazilian oil sector affects its future development. The assessment is conducted through the analysis of the regulatory framework and its impact on four fundamental variables under consideration: strategic control of oil (chapter 5), investments (chapter 6), production (chapter 7) and technology – innovation (chapter 8). It concludes that while the current governance setting is likely to have significant drawbacks in the last three variables, it

³¹ Aldo Musacchio and Sergio G Lazzarini, 'State-Owned Enterprises in Brazil: History and Lessons' <http://www.oecd.org/daf/ca/Workshop_SOEsDevelopmentProcess_Brazil.pdf> accessed 4 April 2014.

³² Petrobras' website <<http://www.petrobras.com.br/rs2009/pt/relatorio-de-sustentabilidade/apresentacao-forma-de-gestao-e-transparencia/perfil/estrutura-societaria/>> accessed 5 May 2013.

does also have the effect of increasing governmental strategic control over the production of oil. This greater strategic control comes, however, at a price for the sector, especially in terms of downsides on investments. Building on the main conclusions of part II, part III subsequently presents specific policy proposals. These proposals are detailed in chapter 9, while chapter 10 concludes the thesis.

2 – THE EVOLUTION OF INSTITUTIONS OF THE BRAZILIAN OIL SECTOR

This chapter analyses the evolution of state intervention in Brazil, assessing how it has designed the regulatory governance of the oil sector in different moments and shaped its institutions. Three special periods serve as analytical milestones: 1988, 1995, and 2010.

The chapter is divided into two sections. The first analyses the origins of the Brazilian oil industry, how it evolved until 2010 and how its principal institutions were formed, taking into account the international context. The second details the 2010 reform and how it altered the existing institutional framework. The first part constantly refers to historical facts and to the evolution of the economics and geopolitics of oil, while the second one is rather focused on the legal changes brought in the year 2010.

2.1 ORIGINS OF THE OIL INDUSTRY AND FORMATION OF ITS INSTITUTIONS

2.1.1 THE BEGINNING OF OIL EXPLOITATION

Oil activities have not always attracted state interest. In the second half of the 19th century, after its discovery, state interference in oil exploitation was almost nil. The second industrial revolution considerably increased the strategic importance of the product. Yet it was not until the beginning of the 20th century that oil activities increasingly involved governmental interest and its direct interference.³³ This progressive intervention reached an upward trend in the years that preceded the First World War and continued during the conflict, when control over the largest oil reserves conferred significant military advantages to allied countries.³⁴ This dominion was an important determinant of their victory, and, to a great extent, among the reasons that led to war.³⁵ From that moment on, energy policy became an essential state issue.

³³ Fernando Pimentel, *O fim da era do petróleo ea mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 31.

³⁴ Maria D'Assuncao Costa Menezello, 'A regulacao e o direito do petroleo' in Carlos Ari Sundfeld (ed), *Direito Administrativo Economico* (Sociedade Brasileira de Direito Publico - sbdp 2002) 379.

³⁵ Daniel Yergin, *The prize: The epic quest for oil, money & power* (Simon and Schuster 2011).

At the beginning of the 20th century, three main lines of action were clearly distinguished among leading global nations with respect to oil policies. Countries such as the United Kingdom and France, which mastered and dominated technology for exploitation and had access to oil deposits, because of their colonies, established exclusive production zones operated by their oil companies. Germany and Japan, without colonies and in need of petroleum for their increasing industrial expansion, were progressively led to imperialist action to control the product, evoking antagonism from the former countries. The United States initially resisted French and English efforts but later backed the signature of the Red Line Agreement, in 1928, between the following British, American and Dutch firms: Compagnie Française des Pétroles, Royal Dutch Shell, Anglo-Persian and the Near East Development Corporation.³⁶ According to the agreement, the exploitation of petroleum in the Middle East, with the exception of Kuwait and Iran, would only take place through consortia of firms belonging to these three countries.³⁷

After the Second World War, the United States became a net importer of oil. This fact led it to a greater expansionist move towards producing countries, mainly those in the Middle East, with the highest international oil reserves. Even following the decline of European colonial powers after Second World War, the United States did not attempt to increase its influence in the Middle East for two main reasons.³⁸ First, its expansion in the region would occur at the expense of the United Kingdom and France, allied countries that could help to stall communist expansion in Europe. Secondly, increasing American intervention in the Middle East could trigger Soviet ambitions in the region and spread its influence among national Arab movements at a crucial moment of the Cold War. For these reasons, maintenance of the underlying principles of the Red Line Agreement represented a safer strategy. The logic of the agreement was therefore preserved through the creation of new holdings with participation of British, French and American companies to exploit oil in the Middle East. The power of these countries'

³⁶ The Near East Development Corporation was formed as an American oil syndicate composed by Atlantic Refining (which later became Arco), Socony, Gulf Oil, Jersey Standard and the Pan-American Petroleum and Transport Company. In the following years Socony and Jersey Standard acquired complete control over the syndicate. Cf. US Department of State: Office of the Historian <<https://history.state.gov/milestones/1921-1936/red-line>> accessed 16 November 2015.

³⁷ Fernando Pimentel, *O fim da era do petróleo ea mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 34.

³⁸ Ibid.

main oil companies, which came to be known as the Seven Sisters, was considerably enhanced thenceforth.³⁹

Yet the Seven Sister's power and their significant profits, especially in the Middle East, triggered nationalist sentiments and inspired regional revolts. Oil multinationals' wealth contrasted with the iniquitous social conditions of host populations and their lack of voice among their governments. International Law had been increasingly taking into account these paradoxes, especially after the creation of the UN, and had been constantly evolving by increasingly recognising state sovereignty over national resources and their right to self-determination.⁴⁰ In 1962, in a landmark decision of its general assembly, the UN acknowledged that: "the right of peoples and nations to permanent sovereignty over their natural wealth and resources must be exercised in the interest of their national development and the well-being of the people of the state concerned."⁴¹

In Brazil, intense and passionate debates had been taking place since the 1930's with respect to oil policy. Even though oil reserves were quite insignificant at that moment, one group advocated a firmer state intervention through the creation of a national oil company with monopoly over resources. Another one, in contrast, supported a more liberal stance to attract foreign investment and multinational companies to conduct research for future oil findings.⁴²

In 1934, the nationalist group with the support of President Getulio Vargas succeeded in inserting a clause in the Federal Constitution, which considered all mineral resources in the subsoil to be state property. The National Petroleum Council (*Conselho Nacional do Petroleo*) was also created in 1938 holding responsibility over oil policy, through the control of prices and production, determining, thereafter, stricter state command over oil production.

³⁹ The term "Seven Sisters" was first used in the 1950s by Enrico Mattei, President of the Italian oil company ENI, to refer to the main oil companies at the time: Exxon, Chevron, Mobil, Shell, BP, Texaco and Gulf. Cf. Ibid.37

⁴⁰ Maria D'Assuncao Costa Menezello, 'A regulacao e o direito do petroleo' in Sundfeld (ed), *Direito Administrativo Economico* (Sociedade Brasileira de Direito Publico - sbdp 2002) 380.

⁴¹ General Assembly resolution 1803 (XVII) of 14 December 1962, "Permanent sovereignty over natural resources". Available at: <http://www2.ohchr.org/english/Law/resources.htm> accessed 28 February 2012.

⁴² Fernando Pimentel, *O fim da era do petróleo ea mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 40.

Later, under the presidency of General Dutra, the 1946 Federal Constitution went on to allow companies formed in the country under Brazilian laws to explore petroleum without requiring them to be constituted by Brazilians. This clause was subject to vigorous debate among the two mentioned groups and encountered fierce resistance of nationalists, who had lost part of their influence after the elections of General Dutra.⁴³

In 1951, Getulio Vargas returned to power and the petroleum industry gained new strategic economic relevance.⁴⁴ Projects were launched for the creation of the Brazilian national oil company, Petrobras. This phenomenon had been taking place in several countries, which considered control over oil reserves a national security imperative. The National Iranian Oil Company (NIOC), for example, was created in Iran, while “Yacimientos Petrolíferos Fiscales” (YFP) and “Corporacion Venezolana de Petroleo” (CVP) started operations respectively in Argentina and Venezuela. In Brazil, despite nationalist claims involving the creation of Petrobras, it was formed as a partially privatised company. The main reason for this decision, according to Carlos Eduardo Paes Barreto,⁴⁵ was the need to raise private funds for the venture and to reduce dependency on the national budget, as would be the case of an entire state-owned firm. He also cited the advantages of not being bound by public laws and their excessive bureaucratic procedures for engaging in contracts and commercial transactions.

While this wave of national oil companies' creation was taking place, oil contracts, in turn, were being progressively renegotiated on a more equitable basis between producing nations and international oil companies (IOCs) around the world. Some contracts provided royalty payments to governments in the same amount of oil companies' profits (known as the 50-50 principle). The first country to do so was Venezuela, in 1943, followed by Saudi Arabia, in 1950.⁴⁶ In Iran, where the British government and Anglo Persian oil company refused to discuss contracts under the new terms, the controversy led to political turmoil and social unrest,

⁴³ Daniela Couto Martins, *A Regulação da Indústria do Petróleo: segundo o modelo constitucional brasileiro* (Fórum 2013) 18.

⁴⁴ Ibid. 18.

⁴⁵ Carlos Eduardo Paes Barreto, *A saga do petróleo brasileiro: "a farra do boi"* (NBL Editora 2001) 33, 34.

⁴⁶ Fernando Pimentel, *O fim da era do petróleo e a mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 42.

culminating with the 1951 nationalisation of the company, as well as the rise to power of Prime Minister Mossadegh. Such iconic change in Iran – with later consequences in the Iranian Revolution – was the result of a wide popular movement, while Mossadegh's 1953 downfall and the return of shah Reza Pahlavi happened in the context of a “coup d'état” orchestrated by the central intelligence agency (CIA).

These more favourable conditions to producer countries and the scenario of consumption and supply growing at relatively similar paces contributed to relatively stable oil market during the 1950's and 1960's, with prices remaining at low levels. Even the 1960 creation of the Organisation of the Petroleum Exporting Countries (OPEC) did not reverse this trend.

2.1.2 THE OIL WEAPON STRATEGY

In the 1970's the international economic conditions of the oil sector changed radically. Low prices of the previous years significantly boosted demand, which tripled in the 1970's. The percentage of oil in the world energy matrix also significantly rose, from 37% to 64.4%.⁴⁷ Producing countries facing these new market conditions responded through price escalations, increasing government revenues and nationalisations. In 1970, Muamar Khadafi's government in Libya increased royalty payments by 20%, while Iran and the other OPEC countries followed the move.⁴⁸ A wave of nationalisations also took place, beginning with Algeria, in 1971, Iraq, in 1972 (taking control of the Iraq petroleum company) and similarly in that year Kuwait, Saudi Arabia and Venezuela.⁴⁹

In 1973, protesting against American support to Israel in the Yom Kippur war, OPEC increased its barrel prices from US\$ 2.90 to US\$ 5.00 and embargoed exports to the US and the

⁴⁷ Ibid. 42.

⁴⁸ Ibid. 43.

⁴⁹ Ibid. 44.

Netherlands. A 15-20% cut in production followed by a price rise to US\$ 11.00, consolidated the so-called oil weapon strategy, leading to the first oil shock.⁵⁰

The immediate consequences of the shock are well known: a combination of inflation and stagnation, which, thereafter, came to be known as stagflation. US GDP was reduced by 6% between 1973 and 1975 and its unemployment rate doubled, reaching 9%.⁵¹ A similar trend prevailed in Europe: Germany's GDP reduced by 1.6% in 1975 and in the UK the decrease amounted to 0.7% in the same year.⁵²

The effects of the first oil shock demonstrated that OPEC's power and capacity to affect oil prices had significantly increased. To seek an alternative to reduce its power, the United States proposed an international energy conference among the main developed petroleum importing countries. The result was the creation of the International Energy Agency (IEA), which had the main goal of coordinating a strategy in response to the price upsurge.⁵³ The inevitable consequences of the first oil shock were a worldwide tendency among consumers to reduce oil consumption, the development of national alternative sources of energy programmes and the international quest for new petroleum deposits, outside OPEC countries.

Brazil was particularly affected by the 1973 first oil shock, which considerably shaped the main lines of its economic strategy and the style of state intervention. An antidemocratic military government then governed the country after a coup in 1964. In the middle of an accelerated growth pattern, the so-called economic miracle, the country was heavily dependent on oil imports and had an economy with high state investment. In contrast to most oil importing countries, Brazil did not implement contractionary fiscal policies, reducing expenditures to tame inflation and control trade and budget deficits. Instead, the military government - to a

⁵⁰ Cf. Munir Maniruzzaman, 'The Issue of Resource Nationalism: Risk Engineering and Dispute Management in the Oil and Gas Industry' (2009) 5 Texas Journal of Oil, Gas & Energy Law 79; and Fernando Pimentel, *O fim da era do petróleo ea mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 45.

⁵¹ Fernando Pimentel, *O fim da era do petróleo ea mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 46.

⁵² Maurice Vaisse, *Les relations internationales depuis 1945* (Armand Colin 2013) 109.

⁵³ Fernando Pimentel, *O fim da era do petróleo ea mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 46.

great extent dependent on economic performance for political support, contracted substantial international loans to maintain economic activity and preserved government spending at high levels. The combination of abundant “petrodollars”, recycled from oil exporting countries to international banks, and the scenario of world recession provoked excess liquidity in financial markets and led interest rates to fall sharply, which facilitated the Brazilian strategy.⁵⁴

The oil shock also stimulated the search for alternative sources of energy in Brazil to reduce oil dependence. Several state projects took place to build power plant energy, nuclear energy devices and an alternative source of energy based on alcohol extracted from sugar cane (biomass). As a result, the Pro-Alcool Programme was launched in 1975.⁵⁵ Between 1976 and 1978 the recession scenario faded away and most economies were brought back to their previous growth paths. Despite such economic recovery, high oil dependence continued to prevail, as later developments would prove.⁵⁶

Additional challenges to the world economy came with the 1979 Iranian revolution and the 1980 Iran-Iraq war, both showing how oil prices still remained significantly sensitive to OPEC's supplies. Iran reduced by half its exports following the revolution and the war with the neighbouring country, which destroyed major petroleum installations. The impacts on the world economy were disastrous: a nominal increase in oil prices of more than 1,000%, by the end of 1981, compared to the previous ten years,⁵⁷ and a significant plunge of world GDP growth rates between 1978 and 1980.⁵⁸

Despite such negative impacts, recovery was already visible during the 1980's, since most alternative energy programmes launched after the first oil shock had begun to show promising results on the oil market. On the one hand, discovery of new oil reserves in Alaska

⁵⁴ This strategy was one of the main reasons for the Brazilian foreign debt crisis that led to a moratorium in 1987, because loans were taken at flexible rates. In the 1980's, compelled by new circumstances, the rates sharply increased.

⁵⁵ Cf. Brasil Portal at <<http://www.brasil.gov.br/linhadotempo/epocas/1975/programa-proalcool>> accessed 20 May 2012.

⁵⁶ Fernando Pimentel, *O fim da era do petróleo ea mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 47.

⁵⁷ Ibid. 48.

⁵⁸ Ibid. 48.

and the beginning of important deposits' explorations along the Gulf of Mexico and the North Sea reduced world dependence on OPEC's supply. On the other hand, the overall importance of oil in the world matrix had been constantly reducing, mainly due to the use of alternative sources, such as natural gas, nuclear energy and coal.⁵⁹ Brazil is a good example of such changes in the energy matrix. Huge hydroelectric power plants – such as the 1979 Itaipu Hydroelectric, with 18,000 MW capacity – increased its role in the energy matrix together with alcohol from sugar cane due to the 1975 Pro-Alcool Programme. Oil discoveries in the Campos basin, in 1984, and in Albacora and Marlin, subsequently, also reduced the country's dependence on oil imports.⁶⁰

2.1.3 THE COUNTER OIL SHOCK AND ITS AFTERMATH

OPEC's unparalleled first decision to reduce prices in 1983 was a turning point in oil history. New market conditions in the petroleum industry, may explain this decision. Some interpret this moment as the beginning of a counter shock period in which prices followed a downward path.⁶¹ Oversupply of oil remained during most of the 1980's, the 1990's and lasted until the year 2001. In 1999, the price reached a bottom level of US\$ 10 a barrel and oil lost relevance as a strategic commodity. Tony Blair's speech at Davos in the year 2000 is emblematic of the prevailing over-optimism: "Twenty years from the oil shock of the 70's, most economists agree that oil is no longer the most important commodity in the world economy. Now that commodity is information."⁶²

Within this setting, during the 1990's, under the influence of liberal economic policies and the so called "Washington Consensus" several national oil companies (NOCs) were privatised or had their main assets sold, such as Yacimientos Fiscales de Bolivia (YPFB). In Brazil, the constitutional reform of 1995 allowed private companies to develop oil activities in the country. Petrobras was the only authorised company to operate in Brazil until then. Later, in

⁵⁹ The oil participation in the world energy matrix decreased from 53% in 1978 to 43% in 1985. Cf. Daniel Yergin, *The prize: The epic quest for oil, money & power* (Simon and Schuster 2011) 718.

⁶⁰ Fernando Pimentel, *O fim da era do petróleo ea mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 49.

⁶¹ Ibid. 49.

⁶² Ibid. 52.

1997, the Petroleum Law (Law 9,478) created the National Petroleum Agency (ANP) and set forth guidelines for oil exploration through a concession regime open to foreign companies. The main characteristic of concession regimes is that the property of the produced oil belongs to the operating oil companies, which are chosen in competitive public tenders in Brazil.⁶³ ANP was constituted as an autonomous agency linked to the Ministry of Mines and Energy. Law 9,478 (Petroleum Law) also established the National Council for Energy Policy (CNPE), which is an advisory council formed by several Ministers.⁶⁴ Its main role is to propose to the President of the Republic energy policies and to issue guidelines about the rational use of energy resources.

The Brazilian economy had been led until the 1990's by significant state regulation and direct interventionism, with the presence of state-owned enterprises in most strategic industries. The country's development strategy favoured market concentration, close private and governmental connections and recurrent price increases. To tame the resultant explosive inflation rates the government frequently negotiated prices with main industrial associations, or even established mandatory price and quantity caps, which were the main features of regulatory activities until then. In the 1990's regulation changed its scope, departing from direct interference and state production and control to focus on activities of oversight, monitoring and competition enhancement. During the first phase, before the 1990's, ministerial departments were responsible for undertaking regulatory activities.⁶⁵ In the following years these tasks were transferred to independent regulatory agencies, which henceforth had their own assets and revenue sources, despite still being formally linked to one ministry of the executive branch.⁶⁶

This new regulatory stance was launched as a result of the economic agenda of President Fernando Henrique Cardoso, responsible for controlling inflation and for establishing a wide range of liberal and market oriented reforms, including privatisation of state-owned

⁶³ See Appendix for a detailed analysis of the different oil regimes.

⁶⁴ Presidential Decree 2,053, which established CNPE's structure and functioning.

< http://www.planalto.gov.br/ccivil_03/decreto/D3520.htm > accessed 23 December 2013.

⁶⁵ Mariana Batista da Silva, 'O Desenho Institucional em Pratica: uma Analise da Governanca Regulatoria e do Desempenho das Agencias Reguladoras Brasileiras' (2009) 33 Encontro Anual Anpocs GT 32 – Politicas Publicas <<http://www.regulacao.gov.br/publicacoes/artigos/o-desenho-institucional-em-pratica-uma-analise-da-governanca-regulatoria-e-do-desempenho-das-agencias-reguladoras-brasileiras>> accessed 15 May 2012.

⁶⁶ Ibid.

enterprises in utility industries. One essential feature of this set of reforms was the use of competition emulation and regulatory oversight as a way to increase Brazilian competitiveness and to maintain price stability. Another important aspect is its intrinsic link to a broader restructuring of Brazilian society, which included socio-political measures of democratisation, political liberalisation and decentralisation of social networks. According to President Fernando Henrique Cardoso, these interconnections were of vital importance to guarantee that the privatisation and deregulation processes were oriented by democratic principles, taking into account their public dimension and exempting them from private appropriation.⁶⁷ The use of the state for private ends by powerful economic groups in the Brazilian past, demanded, according to him, a rupture through democracy, increasing accountability and civil society awareness.⁶⁸

2.1.4 OIL IN THE 21ST CENTURY

Promising results followed the constitutional amendment and the 1997 Petroleum Law, with significant increases in investments, reserve discoveries, oil production and upgrade of Petrobrás' technological standards.⁶⁹ Many experts claim that the 2007 discoveries in the pre-salt layers off the Brazilian coast, which places Brazil among the countries with the 10 largest oil reserves, were a direct consequence of the success of the 1995 reform.⁷⁰

In spite of these favourable results, the regulatory framework was reformed in 2010. President Lula's government argued that modifications were necessary in view of the immense

⁶⁷ Fernando Henrique Cardoso and Mariana Magalhaes, 'Democracy as a starting point' (2001) 12 *Journal of Democracy* 5,14.

⁶⁸ For a broader discussion about privatisation, democratisation and civil society see Adam Przeworski, *Sustainable democracy* (Cambridge University Press 1995).

⁶⁹ Cf. Helder Queiroz Pinto Jr and Mariana Iooty, 'Perspectivas de Desenvolvimento do Setor Petróleo e Gás no Brasil' (2010) 55 *Serie Eixos do Desenvolvimento Brasileiro*; Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013); Adilson De Oliveira, 'Oil and governance: state-owned enterprises and the world energy supply' in David Victor, David Hulst and Mark Thurber (eds), *Oil and Governance* (Cambridge University Press 2012), among others.

⁷⁰ Cf. Helder Queiroz Pinto Jr and Mariana Iooty, 'Perspectivas de Desenvolvimento do Setor Petróleo e Gás no Brasil' (2010) 55 *Serie Eixos do Desenvolvimento Brasileiro*; Walter De Vitto and Richard Hochstetler, 'Perspectivas para os investimentos petrolíferos no Brasil' in Fabio Giambiagi and Luiz Paulo Velloso Lucas (eds), *Petróleo-Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2012); and Guilherme Dias and Alfredo Renault, 'A concentração de recursos na União e as perdas das regiões produtoras' in Giambiagi and Lucas (eds), *Petróleo Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2013).

pre-salt layer oil discoveries. The international context had significantly changed since the 1990's, when the Petroleum Law was enacted and the Constitution amended. At that time, oil prices were low, around US\$ 20 a barrel,⁷¹ supply was relatively abundant, and the oil policy essentially concerned with self-sufficiency. In 2010 oil prices were relatively high, ranging between US\$ 73.75 and US\$ 91.45 per barrel,⁷² new deposits limited, with significant exploration costs, while Brazil was expected to have considerable oil surplus for exports in the near future.

The turning point in the international oil market occurred in 2001, when the downward price path prevailing since 1983 was reverted and a long-term upward trend was inaugurated. In 2008 petroleum reached the record price of US\$ 147 a barrel.⁷³ Despite a period of decreasing prices, during the world financial crisis at the end of 2008, prices recovered in late 2009 and in March 2012 were around US\$ 107 a barrel.⁷⁴ Such growth was mainly driven by a demand escalation, concentrated on emerging countries, especially India and China. High prices were also largely due to reduced levels of supply as a result of insufficient investments during the soaring price period.⁷⁵

Therefore, international market conditions placed Brazil in 2010 in a quite favourable position. Moreover, the country presented some other distinct advantages: its solid democratic trajectory and relatively reliable institutions, especially when compared with most oil exporting countries, as well as its close trade ties with the largest advanced economies, which are important oil importing countries. These circumstances provided then substantial bargaining power to attract investments and negotiate favourable contracts in the oil industry.

⁷¹ Europe Brent Spot Price FOB (Dollars per Barrel) varied between US\$ 15.10 and 36.02 according to the US Energy Information Administration available at: <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RB RTE&f=M> accessed 20 May 2015.

⁷² Europe Brent Spot Price FOB (Dollars per Barrel), according to the US Energy Information Administration available at: <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RB RTE&f=M> accessed 20 May 2015.

⁷³ Fernando Pimentel, *O fim da era do petróleo ea mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 52.

⁷⁴ U.S. Energy Information Administration (EIA) website at: <http://www.eia.gov/> accessed 2 March 2012

⁷⁵ Helder Queiroz Pinto Jr and Mariana Iooty, 'Perspectivas de Desenvolvimento do Setor Petróleo e Gás no Brasil' (2010) 55 *Serie Eixos do Desenvolvimento Brasileiro*.

This overall setting certainly influenced the bill proposals of the 2010 reform, which can be considered interventionist in comparative international terms, as demonstrated in the next sections. The government of President Lula, who proposed the 2010 reform, claimed that it was necessary to increase the state's strategic control over oil and its production process, given the new conditions unveiled with the pre-salt discoveries.

2.2 THE 2010 REFORM IN THE BRAZILIAN OIL SECTOR

Three main laws changed the legal framework of the Brazilian oil sector in 2010: Law 12,351, Law 12,304 and Law 12,276. Other infra-legal norms and contracts have also been issued under the scope of these statutes. The next section focuses on Law 12,351. This statute provided most of the changes in the Brazilian regulatory framework and is, therefore, separately analysed. The other two laws are described below.

Law 12,304 authorises the Executive branch to create PPSA (Pre-Sal Petroleo S.A), a fully state-owned enterprise, linked to the Ministry of Mines and Energy, with the main task of managing the production-sharing contracts to be signed under Law 12,351.

According to Law 12,304, PPSA is under the jurisdiction of private laws since it is a joint stock company. As such, it has to follow a statute and has a board of directors and an executive board. PPSA has been legally created with the enactment of Decree N^o 8,063, of 1 August 2013.

Law 12,276 institutes an onerous relinquishment regime in specific areas of the Brazilian continental shelf. The regime allowed the transference of 5 billion barrels of exploration rights from the Union⁷⁶ to Petrobras, with due compensation. According to its provisions, the national oil company holds ownership of the produced hydrocarbons, which should be subject to royalties⁷⁷ but not the Special Participation Tax.⁷⁸

⁷⁶ The Union is a legal entity of public Law vested with the Brazilian State's sovereignty. Cf. Alexandre De Moraes, *Direito constitucional* (Editora Atlas 2002) 269.

⁷⁷ Article 5 of Law 12,276 of 30 June 2010 (Lei No. 12.276, de 30 de Junho de 2010).

⁷⁸ The Special Participation Tax is a kind of windfall profit tax applied to production volumes or profitability levels considered to be significant. The threshold for its incidence varies according to the complexity involved in the location for oil extraction. Law N. 9,748 specifies that a presidential decree

A troublesome legal aspect of this statute is the concession of these rights to Petrobras without any bidding procedures. Some legal specialists claim that this provision undermines the constitutional principle of free competition⁷⁹ and also article 37, XXI of the Federal Constitution, which establishes that the government should follow strict procurement procedures for contracting services.⁸⁰

These legal and constitutional issues can easily raise questions, especially from Public Prosecutors and the General Accounting Office (TCU). The General Accounting Office has filed some cases at the Supreme Court enquiring about the constitutionality of special bidding procedures used by ANP under Law 9,478. Even though most of these cases have been dismissed at the Supreme Court,⁸¹ the very fact that they have been presented shows that the entities that have filed them are vigilant with respect to procurement practices.

2.2.1 LAW 12,351

Law 12,351 provided two major changes in the Brazilian oil regulatory framework: the exploration of oil and gas in pre-salt and strategic regions according to a production-sharing regime; and the creation of a Social Fund to invest a share of the proceeds of oil exploration in Brazil.

The production-sharing regime only applies to areas of the pre-salt and those considered strategic. Law 9,478 and Law 12,276 govern all other domains. The former sets forth the conditions for exploration of oil according to a concession regime while the latter provides for the previously mentioned onerous relinquishment regime.

will detail the incidence procedures of the special participation in cases of significant profit or production volumes of oil. Decree N. 2,705 was enacted for this purpose and provides the details for its application. Cf. Article 50 of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997).

⁷⁹ Article 170, IV Constitution of the Federative Republic of Brazil (Constituição da República Federativa do Brasil).

⁸⁰ Cf. Antônio Luís de Miranda Ferreira, 'Problemas e inconsistências jurídicas do novo marco regulatório: a ótica dos princípios Constitucionais da livre iniciativa, da economia de mercado e do direito comercial' in Fábio Giambiagi (ed), *Petróleo: Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier 2013); Carlos Jacques Viera Gomes and others, 'Avaliação da proposta para o marco regulatório do pré sal' (Centro de Estudos da Consultoria do Senado federal Textos para discussão, 2009); and Luiz Cezar Quintans(ed), *Contratos de Petroleo Concessao e Partilha Propostas e Leis para o Pre-Sal* (B. Biz Editores 2011).

⁸¹ Cf. Pedro de Abreu e Lima Florencio, 'Supreme Court Decisions with Regard to the Brazilian Oil Sector' (2013) *International Energy Law Review* 18.

Law 12,351 also clarified competences between institutions and centralised formulation and planning functions at ministries, CNPE and the Presidency. This clearer role delimitation contributes to a better institutional design, with enhanced levels of checks and balances between entities and a more functional, legitimate and predictable demarcation of roles among them.

ANP used to perform planning and policy design functions prior to the 2010 reform, especially before 2003, during President Cardoso's mandate.⁸² Paradoxically as it may seem, in Brazil, the greater autonomy and policy leeway granted to regulatory agencies during President Cardoso's term, appears to have been a strategy to maintain a close and strict presidential grip over regulated sectors, circumventing a possible influence coming from the Ministry of Mines and Energy (MME).

When in power, President Cardoso's party, PSDB,⁸³ formed a coalition with PFL,⁸⁴ which is a party situated at the right of the political spectrum. The MME was allocated to the latter as a result of the alliance. Two important regulatory agencies were linked to this ministry: the National Petroleum Agency (ANP) and the National Electricity Power Agency (ANEEL). An excessive emphasis on agencies, at the expense of Ministries, may have been an attempt to insulate public policies from PFL's specific interests, while at the same time aligning them with the Presidency of the Republic. It could have been, in this sense, an ingenious way of allotting ministries to PFL, while still maintaining a significant control over public policies on the hands of PSDB and the President.⁸⁵

It is no surprise that President Cardoso appointed David Zylberstajn, with whom he had close connections and personal trust,⁸⁶ as Director General of the National Petroleum Agency. David Zylberstajn stayed for two terms. The second appointee in President Cardoso's mandate

⁸² Edson Nunes and others, *Agências reguladoras e reforma do Estado no Brasil: inovação e continuidade no sistema político-institucional* (Garamond Universitária 2007) 229.

⁸³ Partido da Social Democracia Brasileira – Party of the Brazilian Social Democracy.

⁸⁴ Partido da Frente Liberal – Party of the Liberal Coalition. It later became Democratas (DEM).

⁸⁵ Edson Nunes and others, *Agências reguladoras e reforma do Estado no Brasil: inovação e continuidade no sistema político-institucional* (Garamond Universitária 2007) 223.

⁸⁶ David Zylberstajn had been President Cardoso's son-in-Law.

for ANP was Sebastião do Rego Barros, a diplomat closely linked to the presidency. Even though the National Electricity Power Agency's President was appointed by PFL, the nomination was mainly established on technical expertise at the request of President Cardoso. Jose Mario Abdo, the president for two terms, was an electrical engineer with extensive experience in the sector. He previously had occupied several positions in electrical state companies and did not have any party affiliation when appointed.

The creation of CNPE in 1997,⁸⁷ jointly with ANP, is an additional element to take into account in this setting. Why would the government propose the creation of a council composed of Ministries of different areas such as the Ministry of Finances, the Ministry of Development, Industry and Trade and the Ministry of Budget and Planning, among others,⁸⁸ to act as an advisory policy formulator in matters of energy, if there is a specific ministry responsible for these issues: the Ministry of Mines and Energy (MME)? Even more counter-intuitive is the council's advisory and non-deliberative nature. Why would the government conceive such a high profile entity to hold only an advisory role to the President? Other high profile councils and chambers such as the National Monetary Council (CMN) and the Foreign Trade Chamber (CAMEX) have essentially deliberative functions. The goal of centralising planning and policy formulation functions on the President, diverting it from MME's influence, seems to be a reasonable conclusion.⁸⁹

Furthermore, CNPE was only constituted in the year 2000, three years after the legal provision authorising its creation: Law 9,478.⁹⁰ Conversely, ANP was swiftly established in January 1998, only five months after the enactment of Law 9,478. Specialists consider such delay as a tacit renouncement of the formulation policies in favour of ANP, which, according to

⁸⁷ Article 2 of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997).

⁸⁸ Presidential Decree No. 2,457, of 14 January 1999 (Decreto Presidencial No. 2.457, de Janeiro de 1999). <http://www.planalto.gov.br/ccivil_03/decreto/D2457.htm> accessed 23 December 2013.

⁸⁹ Bruno Conde Caselli, 'Redesenho institucional e arranjos contratuais: Uma análise da regulação e da indústria de petróleo e gás natural no upstream brasileiro' (Dphil thesis, Universidade Federal do Rio de Janeiro 2012) 69.

⁹⁰ Presidential Decree 2,053, which established CNPE's structure and functioning. <http://www.planalto.gov.br/ccivil_03/decreto/D3520.htm> accessed 23 December 2013.

them, was the entity actually in charge of these functions.⁹¹ Finally, until the enactment of Law 12,351, ANP has also in practice been responsible for functions that are typically related to policy design. These include the decision with respect to the areas to be auctioned⁹² and the elaboration of Tender Protocols and model contracts under the concession regime established in Law 9,478, as will be further examined.⁹³

The above observations regarding presidential influence on regulatory agencies are consistent with the studies mentioned in Chapter 3 about political intervention in these entities in Brazil, which emphasise the Executive branch's influence and ascendancy over them.⁹⁴ Yet the consideration of the Executive branch as a whole homogeneous entity, as has been frequently done in the Brazilian literature on regulatory agencies, leads to a great degree of imprecision in Brazil. Since the country's political system favours the formation of coalition governments, because of the multitude of parties with weak structures, the ministries are allotted to different factions of the ruling alliance.⁹⁵ In this setting, a whole new dynamic takes place within the Executive and its influential focal points towards regulatory agencies tend to be diversified and multifaceted. That is why it is important to examine in more detail the Executive's influence over the National Petroleum Agency, distinguishing it according to its sources: the Ministry of Mines and Energy (MME) and the Presidency of the Republic. While the former's ascendancy over ANP has been feeble and reticent, the latter's, conversely, has been resilient and robust.

⁹¹ Edson Nunes and others, *Agências reguladoras e reforma do Estado no Brasil: inovação e continuidade no sistema político-institucional* (Garamond Universitária 2007)243.

⁹² Ibid. 229.

⁹³ Article 8, IV of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997).

⁹⁴ Mariana Batista Batista, 'Mensurando A Independência Das Agências Regulatórias Brasileiras' (2011) *Planejamento e Políticas Públicas* 213.

⁹⁵ The existence of a multitude of parties with weak structures in Brazil leads them to form alliances once disputing the presidency to maximise their chances of winning. The phenomenon is reinforced when the parties get to power, so they can hold a reliable political majority in Congress to pass the necessary bills to be able to govern. This phenomenon is referred to and studied in Brazilian Political Science Literature as "Governismo de Coalizao" or "Coalition Governance" (personal translation).

Sergio Abranches acknowledges this compartmentalisation tendency within the Brazilian government, which he labels as the “Divided Leviathan”.⁹⁶ According to him, the Brazilian state is subdivided into units holding specific roles, duties and with scarce communication between them. Abranches considers that one of the important consequences of this phenomenon is an overall lack of strategic dimension in their performed tasks.⁹⁷

Considering such general landscape, some of the modifications provided by Law 12,351 that more clearly defined competences among state entities in the Brazilian oil sector are commendable. This is the topic of the next section.

2.2.1.1 DELIMITATION OF COMPETENCES BETWEEN ENTITIES

Law 12,351 delimited competences between entities in the oil sector and shifted some of their previously established allocations according to Law 9,478. Unlike other governmental areas where there has been a continuation of former policies between President Cardoso’s government and his successors in the Workers Party (PT), the oil segment has experienced a change.⁹⁸ One of the important modifications provided by Law 12,351 was the shift in competences among institutions. Such modification had two main goals. The first was to clarify the roles and allocations between regulatory governmental bodies. The second was to assign further policy formulation functions to MME and CNPE, entities directly linked to the presidency, leaving ANP, a typical regulatory agency, focused on functions essentially linked to regulation, such as the monitoring and enforcement of the established exploration plans and the annual working programmes. The change was based on the assessment that during President

⁹⁶ Personal translation of “Leviatã Dividido” cited in Edson Nunes and others, *Agências reguladoras e reforma do Estado no Brasil: inovação e continuidade no sistema político-institucional* (Garamond Universitária 2007) 222.

⁹⁷ Ibid. 222.

⁹⁸ Cf. Bruno Conde Caselli, ‘Redesenho institucional e arranjos contratuais: Uma análise da regulação e da indústria de petróleo e gás natural no upstream brasileiro’ (Dphil thesis, Universidade Federal do Rio de Janeiro 2012); and Edmar Lisboa Bacha and Regis Bonelli, ‘Uma interpretação das causas da desaceleração econômica do Brasil’ (2005) 25 *Revista de economia política* 163.

Cardoso's term, agencies frequently assumed main policy formulation functions beyond their essential roles.⁹⁹

Law 12,351 promoted several modifications in the competences of these three entities. The first one relates to the signature of oil exploration contracts. While Law 9,478 considers the National Petroleum Agency (ANP) as the state's representative for the signature of contracts in the concession regime,¹⁰⁰ according to Law 12,351 it is the Ministry of Mines and Energy (MME) that signs production-sharing agreements.¹⁰¹

Under Law 9,478, before the 2010 reforms, ANP used to propose to CNPE the area of the blocks to be auctioned.¹⁰² The new statute entrusts this task to the MME. The approval of draft Tender Protocols in new auctioned areas was also subject to change. According to Law 9,478, ANP is entirely responsible for Tender Protocols while in Law 12,351 it is the MME. Other functions that weren't clearly defined under Law 9,478 were also assigned to the MME in the new statute, such as the responsibility over the definition of technical and economic parameters for auctions and for production-sharing contracts.¹⁰³

Law 12,351 increased, similarly, CNPE's functions. These include the power to make recommendations to the President of the Republic regarding the following points: technical and economic parameters of production-sharing contracts;¹⁰⁴ areas of the blocks to be auctioned using production-sharing agreements;¹⁰⁵ areas to be considered strategic according to the terms

⁹⁹ Organisation de coopération et de développement économiques (OECD), 'Brazil strengthening governance for growth' (2008).

¹⁰⁰ Article 8, IV of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997).

¹⁰¹ Article 8 of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

¹⁰² Before the 2010 reforms, Law 9,478 did not explicitly assign to any entity the role of proposal of auctioned areas. Yet Article 8, II of Law 9,478 stated that ANP would conduct studies for the delimitation of the areas. Even though there was no explicit mention that ANP would be responsible for the proposal of the auctioned areas to CNPE in Law 9,478, since it was the only entity conducting studies and no other mention was made in terms of proposal, in practice these studies were equivalent to a recommendation.

¹⁰³ Article 10 of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

¹⁰⁴ Article 9, IV of *ibid.*

¹⁰⁵ Article 9, III of *ibid.*

defined in Law;¹⁰⁶ and areas in which Petrobras will be directly contracted without a public tender.¹⁰⁷

These provisions of Law 12,351 aim at revamping CNPE's role as public policy formulator and planner, which had remained rather unclear hitherto under Law 9,478. Even though the Council holds only advisory functions, its direct link to the President and composition with Ministries and high-ranking officials from different areas, places it in a fairly influential position with respect to energy policies. Here again, the objective of the provisions to reduce ANP's allegedly excessive roles in planning and policy design seems evident.

One of the problems of having regulatory agencies responsible for policy formulation roles is their lack of legitimacy for accomplishing them. These entities are expected to remain insulated from governmental political influence and private parties' specific interests. That is why they tend to have a technocratic structure and design, which aim at safeguarding their independence.¹⁰⁸

If regulatory agencies undertake policy formulation and planning functions they risk becoming entwined with politics and their perceived autonomy is affected. Moreover, main public policies are to be designed by democratically elected governmental institutions and not by entities such as regulatory agencies, which are expected to act with independence. This does not mean, however, that regulatory agencies should be insulated from stakeholders and interest groups. Rather the opposite, they should be constantly taking into account their feedback using responsive regulatory strategies.¹⁰⁹

Taking into account these features, the next sections examine next the other two main modifications brought by Law 12,351. The first sections analyses the production-sharing regime, while the next one examines the Social Fund.

¹⁰⁶ Article 9, V of *ibid.*

¹⁰⁷ Article 8, I of *ibid.* establishes the possibility of directly contracting Petrobras, without a public tender.

¹⁰⁸ See discussions in Chapter 3.

¹⁰⁹ See discussions in chapter 3.

2.2.1.2 THE PRODUCTION-SHARING REGIME AND ITS PECULIARITIES IN BRAZIL

The principal distinguishing feature of production-sharing regimes is that the property of the extracted oil belongs to the state.¹¹⁰ After extraction, the production costs, labelled “cost oil”, are reimbursed to the producing oil companies, while the remaining “profit oil” is split between state and producers. The percentage of “profit oil” that goes to each can be determined in several ways. In Brazil, an open bidding round, in which competing companies present their offers, starting from a minimum level previously stipulated in the Tender Protocol, sets the share between state and producing oil companies.¹¹¹

Some countries provide for a ceiling, limiting the amount of recoupment for cost oil, to avoid moral hazard situations,¹¹² in which producers can have an incentive to inflate their costs.¹¹³ Law 12,351 does not, however, establish this maximum level for cost oil recoupment. In the first bidding round for pre-salt areas this amount was inserted in the draft production-sharing contract of the Tender Protocol.¹¹⁴ The choice of legislators and Brazilian authorities seems to have been to leave this issue to be decided on a case-by-case basis, according to the particular conditions of each bidding round, instead of defining a general legal cap.

This decision actually confers more flexibility to public policy formulators. A legal clause could establish very stringent or lax terms of risk and return.¹¹⁵ It would make future modifications more difficult, requiring a bill amendment to be submitted to Congress. The oil sector is a dynamic segment. Its conditions of profitability often change, according to several variables such as the discovery of new reserves, price fluctuations and local political conditions.

¹¹⁰ See Appendix for an analysis of the distinction of the different types of oil regimes.

¹¹¹ Article 18 of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

¹¹² A situation of moral risk, or moral hazard occurs whenever the existence of insurance to an agent impels him to engage in irresponsible and socially undesirable actions. In the present case this action would be to exaggerate the costs. Another example in economic theory is when an agent starts smoking more and caring less about his health because he has bought a health insurance.

¹¹³ Cf. Paulo César Ribeiro Lima, *Pré-sal, o novo marco legal e a capitalização da Petrobras* (Synergia Editora 2011) 49 and also Mauricio Tiomno Tolmasquim et al. (eds), *Marcos Regulatórios da Indústria Mundial do Petróleo* (Synergia 2011) 34.

¹¹⁴ See the National Petroleum Agency’s webpage < http://www.brazil-rounds.gov.br/arquivos/Edital_p1/Minuta_Edital/minuta_edital_autorizada_09072013.pdf >, accessed 13 October 2013.

¹¹⁵ The amount of cost oil to be recouped is an essential variable for the definition of the parameters of risk and return of a certain venture. If the recoupment of cost oil is higher the operation will be less risky and allow a higher return. If the recoupment were lower the opposite would occur.

In principle, it is desirable to employ more versatile elements to establish the parameters of risk and return in such a volatile and changing environment, instead of fixed and pre-defined terms, which are more difficult to change.

These features of the Brazilian production-sharing regime do not significantly differ from most of the existing models in the world.¹¹⁶ There is one specific peculiarity inserted in Law 12,351, however, which is unique to Brazil. It is the operational exclusivity assigned to Petrobras in all blocks located in pre-salt domains and in areas considered to be strategic.¹¹⁷ In other words, Petrobras will be the only authorised company to have operations in these locations.

The pre-salt area is defined in article 2, IV of Law 12,351, according to specific geographical coordinates, while strategic areas are considered to be those with high production potential, low risk and significant importance for national development. A specific act of the Executive Power will determine “strategic areas” upon consideration of these elements, according to article 2, V of Law 12,351.

Even though other oil companies cannot operate within pre-salt domains and strategic areas, because of Petrobras’ exclusivity, they can participate as investors, via consortia, according to section VII of Law 12,351. However, Petrobras is required to have a 30 % minimum participation in all consortia,¹¹⁸ which means that these companies will end up disputing the remaining 70% share.

Article 8, I of Law 12,351 also establishes the possibility of directly contracting Petrobras without a public tender in pre-salt and strategic areas.¹¹⁹ In these instances, the oil company will be the only investor and operator in that specific area. The decision to directly

¹¹⁶ Cf. Kirsten Bindemann, ‘Production-sharing agreements: an economic analysis’ Oxford Institute for Energy Studies Oxford <<http://www.oxfordenergy.org/wpcms/wp-content/uploads/2010/11/WPM25-ProductionSharingAgreementsAnEconomicAnalysis-KBindemann-1999.pdf>> accessed 10 June 2015; and Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011).

¹¹⁷ According to Article 4 of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

¹¹⁸ According to Article 10, III, c of *ibid.*

¹¹⁹ According to Article 12 of *ibid.*

contract Petrobras for a certain domain rests upon the Brazilian President, according to a recommendation of the National Council of Energy Policy (CNPE). In these cases, the Federal government, through the Ministry of Mines and Energy, will sign production-sharing contracts with Petrobras. In all other situations, in which public tenders take place, the contracts will be signed with the representative of the winning consortium.

As will be further detailed, these peculiarities of the Brazilian production-sharing regime will require significant coordination efforts between institutions in the oil sector and will inevitably lead to complicated and imbricated governance structures and mechanisms.¹²⁰ This new institutional setting will have a direct impact on the variables studied in the thesis, as will be demonstrated.

Another important issue raised by the 2010 changes is the possible unconstitutionality of some of the provisions. The clauses conferring exclusive operational rights to Petrobras within pre-salt layers and areas considered to be of strategic importance¹²¹ seem to contradict the principle of free competition, inscribed in article 170, IV of the Federal Constitution. This principle applies to all economic activities, providing open equal opportunities in public tenders. Article 37, XXI of the Federal Constitution, under the same logic, requires the government to undertake specific procurement rules for contracting services. This requirement seems to have been ignored by the provision establishing Petrobras' operational exclusivity.¹²²

2.2.1.3 THE SOCIAL FUND

The Social Fund was an important innovation in Brazilian energy policy, which until the enactment of Law 12,351, in June 2010, did not have a significant set of consistent programmes and actions with social and development purposes. The Social Fund aims at providing monetary

¹²⁰ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011).

¹²¹ Articles 2, VI and 4 of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

¹²² Cf. Antônio Luís de Miranda Ferreira, 'Problemas e inconsistências jurídicas do novo marco regulatório: a ótica dos princípios Constitucionais da livre iniciativa, da economia de mercado e do direito comercial' in Giambiagi (ed), *Petróleo: Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier 2013) and Carlos Jacques Viera Gomes and others, 'Avaliação da proposta para o marco regulatório do pré sal' (Centro de Estudos da Consultoria do Senado federal Textos para discussão, 2009).

resources for social and regional development in Brazil via programmes and projects in the following areas: poverty reduction; education; culture; sports; public health; science and technology; environment; and climate change.¹²³

The resources for the Social Fund will come from a percentage of the Signature Bonuses of production-sharing agreements, the amount of royalties allocated to the Federal Government in pre-salt domains and in areas considered to be strategic and through the revenue earned from the commercialisation of oil and gas in kind from the profit oil in production-sharing agreements.¹²⁴

On 9 September 2013, Law 12,858 established that 50% of the Social Fund's resources should be exclusively applied in health and education until the targets of the National Plan of Education have been reached.¹²⁵ The statute also provided that royalty revenues and Special Participation Tax resources from offshore oil deposits where the declaration of commerciality has been issued after 3 December 2012 should be entirely directed to health and education.¹²⁶

The capital of the Social Fund will be preferentially invested in secure foreign assets with high profitability, to avoid the negative side effects of excessive income volatility.¹²⁷ Its investment policy will be defined by the Social Fund's Financial Management Committee, which shall be appointed by the government. Its members will not receive any financial compensation for exercising their functions. The Social Fund's Deliberative Council, in turn, will be responsible for proposing to the Executive the destination of the Fund's resources.

Only funds generated from the return on principal will be used on projects and programmes in the previously mentioned areas.¹²⁸ After the Social Fund has attained its

¹²³ Article 47, VII of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

¹²⁴ Article 49 of *ibid.*

¹²⁵ Appendix of Law 13,005 of 25 June 2014 (Lei No. 13.005, de 25 de Junho de 2014).

¹²⁶ Article 1, I and II, of Law 12,858 of 9 September 2013 (Lei No. 12.858, de 9 de setembro de 2013).

¹²⁷ Article 50 of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

¹²⁸ Article 51 of *ibid.*

“economic and financial sustainability”, the Executive will be able to issue a Law proposing the use of a percentage of the Fund’s principal capital.¹²⁹

The creation of the Social Fund is one of the most important modifications of the 2010 oil regulatory framework. Brazil is considered to be a buoyant economy, ranking the seventh largest GDP in the world,¹³⁰ with a solid and diversified industrial base and significant production of sophisticated goods such as in the aviation and telecommunication industries. Yet whenever social aspects are taken into consideration, the country always lags behind most of the main world economies. The most problematic issues include inequality of income, health and education. The latter two are of poor quality, still supplied in insufficient levels and, above all, incompatible with a country having the seventh largest GDP in the world. Concerning inequality, despite the reduction of recent years, Brazil is still considered one of the most inequitable countries of the world. Its Gini index is currently of 54.7, which ranks it as the fourth worse country in a group of 46 countries assessed by the World Bank in 2010.¹³¹

The Social Fund is therefore an important initiative to redress this landscape. One of its principal advantages is to provide for an initial phase in which only the return on capital can be used. Provisions of this type have also been used in Norway’s oil fund, which has acted as a sort of benchmark for Brazil.¹³² They are important to ensure that the Fund’s capital will not be dispersed irresponsibly. The second phase in which the principal capital may be partially used, after the Fund has attained “economic and financial sustainability”,¹³³ needs, however, further clarification. The use of this broad and vague concept for such an important financial aspect that safeguards the Fund’s long-term profitability should be further detailed to avoid any kind of opportunistic attempt to use its capital in a manner that could affect its long-term profitability.

¹²⁹ Article 51, sole paragraph of *ibid*.

¹³⁰ World Bank figures available at: <<http://data.worldbank.org/data-catalog/GDP-ranking-table>> accessed 14 April 2015.

¹³¹ Data available from the World Bank:< <http://data.worldbank.org/indicator/SI.POV.GINI>> accessed 28 November 2013.

¹³² See discussions in Chapter 4.

¹³³ Article 51, sole paragraph of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

It is essential, moreover, to establish exactly what will be the maximum percentage of the principal that can be used after the fund has attained its “economic and financial sustainability”.

The Social Fund has three main goals.¹³⁴ First, to supply resources for national and regional development. Second, to ensure that future generations will also be able to profit from the country’s oil wealth and that the current ones will not squander the resources on inconsistent short-sighted and unsustainable projects. In other words, it is a mechanism of inter-generation compensation. Third, it aims at mitigating potential problems coming from an excessive revenue variation or influx in the economy because of the importance that oil will assume in the Brazilian future. In this latter sense it can be considered a typical stabilisation fund.¹³⁵ It intends, more specifically, to minimise one of the recurrent problems of oil exporting countries: the so called “resource curse”, also known as “paradox of the plenty theory”.¹³⁶ According to this theory, a commodity exporter country tends to stay excessively dependent on revenues of this single product and does not develop its industries, infrastructure and social standards. In ensuring that resources will be directed to education, science, technology and development the fund intends to mitigate this problem, since these elements are expected to increase the economy’s overall productivity.

Even though this concern about the resource curse is commendable, studies indicate that it might not actually be a significant future problem in Brazil.¹³⁷ Differently from other smaller economies in Africa and in the Middle East, for example, where oil resources account for the bulk of GDP and exports, forecasts indicate that the same will not happen in Brazil. Luciano Losekan and Thiago Periard demonstrate that since the Brazilian economy is big and diversified, oil exports will not represent a significant share of GDP in the country, if compared

¹³⁴ Article 48 of *ibid.*

¹³⁵ Mark Allen and Jaime Caruana, ‘Sovereign Wealth Funds: A Work Agenda’ (2008) 29 International Monetary Fund.

¹³⁶ Cf. Macartan Humphreys, Jeffrey Sachs and Joseph E Stiglitz, *Escaping the resource curse* (Cambridge University Press 2007).

¹³⁷ Cf. Carlos Jacques Viera Gomes and others, ‘Avaliação da proposta para o marco regulatório do pré sal’ (Centro de Estudos da Consultoria do Senado federal Textos para discussão, 2009); and Luciano Losekann and Thiago Periard, *Projecoes do Pre-sal: O Brasil sera um petro-estado?* (Blog Infopetro 2013).

to other petro-states where the level of dependency with respect to this product is very high.¹³⁸ They forecast that in 2035 0.002 barrels of petroleum will be exported for each 1 US dollar of real GDP. This indicator is substantially lower than other smaller countries, more dependent on oil and with a less diversified economy such as Iraq and Angola, with indicators of 0.02.¹³⁹ Analogously, the Brazilian indicator of oil production as a proportion of consumption in 2035 will be 2, according to the authors' estimates. This means that the country will produce twice its consumption needs in that specific year. Most oil exporters and OPEC countries have an indicator greater than 5.¹⁴⁰ This mainly happens because Brazil is an industrialised country with relatively high consumption levels of oil. Unlike most oil exporters in the world, Brazil discovered the bulk of its oil reserves after developing a dynamic and diversified industrial economy. This fact diminishes significantly the risks of the country being affected by any sort of resource curse because its economic dependency on oil is rather small, compared to most petro-states, and so is its forecasted exportable oil surplus, according to the abovementioned indicators.¹⁴¹

Since it is unlikely that Brazil will face a resource curse and that oil revenues will lead to abrupt oscillations in most of the economic variables such as the exchange rate, inflation and GDP, it would be better if the Brazilian Social Fund could concentrate on its social and inter-generation saving aspects rather than on its stabilisation goals. One of the potential risks for the Fund is that its diversified objectives might lead to possible future stalemates or divergences that could affect its long-term effectiveness. Actions within its stabilisation scope might include, for example, initiatives to remedy short-term oscillations of the exchange rate. If these actions are used excessively it is possible that the social and inter-generational goals of the Fund might be affected by these short-term economic purposes, under the influence of the powerful economic ministries.

¹³⁸ Luciano Losekann and Thiago Periard, *Projecoes do Pre-sal: O Brasil sera um petro-estado?* (Blog Infopetro 2013)

¹³⁹ Ibid.

¹⁴⁰ Ibid.

¹⁴¹ Cf. for example, Macartan Humphreys, Jeffrey Sachs and Joseph Stiglitz, *Escaping the Resource Curse* (Columbia University Press 2007).

2.3 CONCLUSION

The Brazilian state's influence in the oil sector has actually shown a pendulous movement throughout time, following the international tendency, with domestic nuances. In an initial period, from Petrobras' creation, in 1953, until 1995, state presence has been pervasive and strong, with operational exclusivity being granted to the national oil company. Such robust interference was important for the formation of the Brazilian oil sector, since the lack of promising prospects for oil exploitation in the country would not have interested the private sector. The constitution of Petrobras as a solid and technologically advanced corporation therefore began with this essential state support, which was predominant until 1995.

From that moment onwards, the weak governmental financial situation and the prevailing economic ideology led to an opening of the oil industry to international oil companies and to a change in the regulatory framework. This modification generated very promising results, including the discovery of pre-salt reserves in 2007. It was part of President Cardoso's liberal reforms aiming to emulate competition and to increase regulatory oversight as an important means to raise the country's competitiveness and to control inflation. His government launched a regulation model with clear predominance of regulatory agencies over other entities of the Executive branch, especially in the oil sector.

The government of President Lula departed from the regulatory model of his predecessor by removing regulatory agencies' allocations and by increasing the influence of entities directly linked to the presidency in oil policies. This stricter governmental control over the oil sector follows a crescendo, which reaches its peak in 2010, with the regulatory framework's reform. Such reform to a great extent reflected the favourable new landscape of the Brazilian oil sector, with the discovery of promising reserves, in a global context of high prices and relative excess liquidity for investments. Yet such backdrop is radically altered in 2014, with the sharp plunge in crude's price and an overall economic background of recession and investment retraction.

Until 2010, the oil sector in Brazil had counted with adequate governance structures and a set of consistent and successfully implemented policies in the most diverse historical contexts. After an initial robust state control over the oil industry during its initial developments, this interference was mitigated in the 1990's but in a rational and balanced manner, still maintaining state control over the national oil company, while also allowing it to compete with other corporations. This governmental grip proved important in bringing to the company a strategic long-term dimension, considering national priorities and aspects beyond mere short term corporate profitability, as will be further detailed in chapter 4. Hence, when the vast pre-salt layers were discovered in 2007, Brazil already possessed a relatively well-developed oil industry and a diversified and industrialised economy, which mitigated to a great extent the resource curse risk.¹⁴² This favourable situation is no mere coincidence and actually resulted from a set of consistent and well-adjusted past policies.

Unfortunately the Brazilian 2010 reform is reversing such positive path, despite some encouraging aspects here pointed out such as the Social Fund and the greater delimitation of competences between regulatory and policy planning entities. Exactly in a moment when the upstream sector needs a substantial amount of investment and a boost in technological standards due to the important challenges in the pre-salt region, the government promoted reforms that lead to significant drawbacks in these areas, as will be demonstrated in part II of the thesis. The regulatory framework also significantly restrained competition, precisely when the company was more than prepared to successfully face it. Finally, the design of governance structures and oil policies that are excessively dependent on one single state-owned company in a context in which the oil sector is expected to assume a leading role in the Brazilian economy is risky and increases the probability of corruption in the company, as further developments will show.

¹⁴² Cf. Macartan Humphreys, Jeffrey Sachs and Joseph E Stiglitz, *Escaping the resource curse* (Cambridge University Press 2007).

3 - REGULATION THEORY AND APPLICATIONS TO THE BRAZILIAN OIL SECTOR

The main goal of this chapter is to discuss regulatory theory and how it is specifically applied to the oil sector and to the Brazilian context. Since the thesis does not use an exclusive analytical framework, the objective here is to examine the theories that are most pertinent to the analysis and how they specifically apply to each context.

Regulation has been defined in various ways by numerous authors. Despite all definitions and their nuances, they all in one way or another relate to the control of an activity for the public interest. Robert Baldwin and Martin Cave provide a good explanation. According to them, “Regulation is often thought of as an activity that restricts behaviour and prevents the occurrence of certain undesirable activities.”¹⁴³ Regulation therefore involves an activity undertaken by the government, which uses its power to coerce, limit, restrain or control private parties’ actions to benefit society as a whole.

There are several theories that explain the reasons for regulation, how it develops and applies in practice. Regulation may arise, for instance, as a result of the pressure that interest groups exert on politicians. It may, on the other hand, be the direct consequence of popular appeal for intervention to remedy an anticompetitive situation, such as a monopoly, for example. Viscusi, Harrington Jr. and Vernon distinguish between situations when regulation should take place, called “normative analysis”, as opposed to “positive theory”, which explains when regulation does actually happen.¹⁴⁴

Normative theories are primarily concerned with the technical justifications for regulation, mainly using economic theory, while positive analysis enquires about the motives and explanations for regulation. This chapter does not consider normative theories concentrating, instead, on the positive approach, in the first sections. Within this setting,

¹⁴³ Robert Baldwin, Martin Cave and Martin Lodge, *Understanding regulation : theory, strategy, and practice* (2nd ed. / Robert Baldwin, Martin Cave, Martin Lodge. edn, Oxford University Press 2012) 2.

¹⁴⁴ William Kip Viscusi, Joseph Harrington and John Vernon, *Economics of regulation and antitrust* (MIT Press 2005) 377.

interest theories and institutional theories are subsequently analysed, with a special focus on the latter, which is one of the main theoretical framework used in the thesis. While considering them, constant references are made to how they apply to the oil sector in general, and to Brazil in particular.

Reflexive and responsive theories are analysed in the last part of the chapter. These theories transcend the regulatory and deregulatory debate that is normally present in normative and interest theories, proposing, instead, new forms of relationships and interactions between stakeholders and systems. They will assume specific relevance throughout the thesis', especially in chapter 9.

3.1 INTEREST THEORIES

Interest theories analyse how and why regulation takes place, stressing the interest behind it as the main driving force. Despite the several existing conceptual frameworks, they can all be categorised in two main groups, according to their public and private versions.¹⁴⁵

3.1.1 PUBLIC INTEREST THEORY

Public Interest theory considers that regulators mainly act in the public interest on occasions when markets fail to yield the optimal social result. Therefore, according to this framework, regulation is mainly justified in the situations in which there are technical grounds for interventions. For this reason, this theory has also been recently labelled as "Normative Analysis as a Positive Theory".¹⁴⁶

One of the main assumptions of Public Interest theory is that markets tend towards allocative efficiency and that government regulatory action is therefore only justified in situations of market failure, as a way to remedy them. Since regulation is a specific governmental action in response to a social demand for the overall benefit, public interest

¹⁴⁵ Robert Baldwin, Martin Cave and Martin Lodge, *Understanding regulation : theory, strategy, and practice* (2nd ed. / Robert Baldwin, Martin Cave, Martin Lodge. edn, Oxford University Press 2012) 21.

¹⁴⁶ William Kip Viscusi, Joseph Harrington and John Vernon, *Economics of regulation and antitrust* (MIT Press 2005) 375.

stands as a presumption of the theory. Therefore, it is assumed that regulatory agencies always act for the general well-being and any deviation from this goal is supposed to result from inadequate operational and functional problems, instead of deriving from mistaken policy goals.

Public Interest theory has faced four significant criticisms. First, it does not test, explain or detail why and how regulation takes place to correct market failures, using it, instead, as a theoretical assumption.¹⁴⁷ Second, and as a direct consequence of the first point, there seems to exist a tautological and circular relationship between market failures and regulation that makes it difficult to correctly identify if the causation link goes from the former to the latter, as expected, or if, instead, the opposite may be happening.¹⁴⁸ Based on this understanding, Peltzman et al.' state: "To be sure, a good economist needs no more than fifteen minutes' notice to produce a market failure to 'explain' any of these interventions. But credulity is strained when the list of market failures grows at roughly the same rate as the number of regulatory agencies."¹⁴⁹

The third, and main reason for the theory's lack of support among scholars, is the significant amount of empirical evidence that rejects it, demonstrating that numerous regulatory policies have undesirable social outcomes that benefit certain groups to the detriment of others.¹⁵⁰ Finally, the theory assumes that state interventionism is always effective, neutral and without any social costs. George Stigler and other economists have criticised this assumption showing that government action is far from neutral and sometimes generates significant social costs, or "government failures", as they label it.¹⁵¹

¹⁴⁷ Ibid. 378.

¹⁴⁸ Sam Peltzman, Michael E Levine and Roger G Noll, 'The economic theory of regulation after a decade of deregulation' (1989) Brookings Papers on Economic Activity Microeconomics 1 referred to in Mariana Batista da Silva, 'A Difusão da Regulação Governamental: uma resenha da literatura' (2008) 6 Revista Habitus 21.

¹⁴⁹ Sam Peltzman, Michael E Levine and Roger G Noll, 'The economic theory of regulation after a decade of deregulation' (1989) Brookings Papers on Economic Activity Microeconomics 1 cited in Mariana Batista da Silva, 'A Difusão da Regulação Governamental: uma resenha da literatura' (2008) 6 Revista Habitus 22.

¹⁵⁰ Richard A Posner, *Theories of economic regulation* (National Bureau of Economic Research Cambridge, Mass., USA 1974) 335,358, referred to in William Kip Viscusi, Joseph Harrington and John Vernon, *Economics of regulation and antitrust* (MIT Press 2005).

¹⁵¹ George J Stigler, 'The theory of economic regulation' (1971) The Bell journal of economics and management science 3.

3.1.2 PRIVATE INTEREST THEORIES

Private Interest theories take into account how private parties' interests determine regulatory outcomes. They encompass several theoretical variations nominated in different ways.¹⁵²

The Capture theory represented a first stark reaction against Public Interest theory. It mainly attempted to explain its empirical inconsistencies as well as the statistical evidence showing that regulation was favourable to producers and tilted towards increasing industrial profits.

Capture theory considers that regulation is a direct response to industry's claims, which would therefore control the regulator in its own best interests. The theory was further refined by George Stigler in what has been considered the "Economic Theory of Regulation" or the "Chicago School Approach".¹⁵³ The theory assumes that there actually exists a market for regulation between regulated industries and legislators, whereby the former would try to influence the latter through financial compensation and votes to extract beneficial outcomes.

Sam Peltzman builds further on Stigler's work, demonstrating that regulatory policy is not captured by only one group's interest. Politicians attempt to take into account several groups' claims establishing an outcome that satisfies the best overall interest.¹⁵⁴ Among those groups he included consumers, since they also are a source of revenue and votes. However, according to James Wilson's studies, consumers are not likely to effectively influence legislators, since they are not well organised and their potential gain from legislation tends to be significantly lower than that of other groups. According to Wilson, regulation tends to favour

¹⁵² Some of the nominations are "Economic Theory of Regulation", "Chicago", "Capture", "Private Interest" and "Special Interest", among others. Cf. Robert Baldwin, Martin Cave and Martin Lodge, *Understanding regulation : theory, strategy, and practice* (2nd ed. / Robert Baldwin, Martin Cave, Martin Lodge. edn, Oxford University Press 2012) 21,22.

¹⁵³ George J Stigler, 'The theory of economic regulation' (1971) *The Bell journal of economics and management science* 3.

¹⁵⁴ Sam Peltzman, Michael E Levine and Roger G Noll, 'The economic theory of regulation after a decade of deregulation' (1989) *Brookings Papers on Economic Activity Microeconomics* 1 referred to in Mariana Batista da Silva, 'A Difusão da Regulação Governamental: uma resenha da literatura' (2008) 6 *Revista Habitus*.

small and organised interest groups with tenacious and cohesive preferences at the expense of large ones with preferences.¹⁵⁵

Gary Becker refines the argument that several pressure groups influence politicians linking it to Normative theories.¹⁵⁶ He argues that apart from their own interests, politicians also take into account social welfare and efficiency, seeking to maintain a relative balance between different pressure groups and also between winners and losers of regulatory action.

Private Interest theories have contributed significantly in explaining and understanding the reasons behind regulation and how it comes into force. However, these theories have several limitations. First, they tend to have a rather narrow and partial view of state institutions as formed by individuals who only take into account their self-interest. Public welfare is almost neglected and stress is placed on how technically defined regulatory goals are avoided and mitigated. Yet individuals are not only driven by welfare maximisation. They tend to have diverse and even antagonist interests according to the roles they play as consumers, producers, civil servants, politicians and so forth.¹⁵⁷ To explain how these sometimes contradictory preferences are translated into regulatory outcomes is complicated. Bureaucrats, in turn, may not always act in their own immediate self-interest because of greater public ideals, ideology, moral imperatives or even lack of expertise and knowledge.¹⁵⁸

Second, the theory seems to assume that regulatory outcomes derive directly from legislators, ignoring the role played by regulators who enforce, interpret and monitor the rules and can, therefore, play an essential part in defining their results. Third, the theory leaves rather ignored the force that ideas can play in changing regulations. Finally, and maybe most

¹⁵⁵ James Q Wilson, *The politics of regulation* (Basic Books (AZ) 1980) 24 referred to in Robert Baldwin, Martin Cave and Martin Lodge, *Understanding regulation : theory, strategy, and practice* (2nd ed. / Robert Baldwin, Martin Cave, Martin Lodge. edn, Oxford University Press 2012).

¹⁵⁶ Gary S Becker, 'A theory of competition among pressure groups for political influence' (1983) *The Quarterly Journal of Economics* 371-400 referred to in Mariana Batista da Silva, 'A Difusão da Regulação Governamental: uma resenha da literatura' (2008) 6 *Revista Habitus*.

¹⁵⁷ Robert Baldwin, Martin Cave and Martin Lodge, *Understanding regulation : theory, strategy, and practice* (2nd ed. / Robert Baldwin, Martin Cave, Martin Lodge. edn, Oxford University Press 2012) 25.

¹⁵⁸ *Ibid.* 22.

importantly, these theories do not take into account the institutional context in which regulatory policies are formulated, developed and enforced.¹⁵⁹

3.2 INSTITUTIONAL THEORIES

Institutional theorists argue that regulations are fundamentally determined by institutional settings, arrangements and rules, rather than the preferences of individuals that maximise wealth. Despite the several strands of the literature with their specificities and nuances, one common ground of all theorists is the general idea that institutions influence regulation. Numerous have also been the definitions given to institutions in political science, sociology, law and economics. Avner Greif provides a comprehensive definition, which has the advantage of encompassing concepts from different areas of knowledge in an attempt to unify the understanding of the term. According to Greif “An institution is a system of social factors that conjointly generate a regularity of behaviour. Each component of this system is social in being man-made, nonphysical factor that is exogenous to each individual whose behaviour it influences.”¹⁶⁰

Within this scope, New Institutionalists have more recently driven their focus towards delegation problems arising in institutional settings when one agent performs a particular task on another one’s behalf. Scholars have dedicated special attention to difficulties in these cases coming from principal-agent problems, especially those occurring when elected politicians implement their public policies relying on unaccountable agencies.¹⁶¹ The main issue to be considered in these cases is the following. The President, the legislative branch, or both (principals), delegate power to regulators (agents) for their expertise. The goal is to be able to implement better policies and to ensure that the decision-making process will be undertaken without undue political interference. However, principals incur two kinds of common risks in this delegation process. The first is called an adverse selection risk, defined as the peril involved

¹⁵⁹ Ibid.

¹⁶⁰ Avner Greif, *Institutions and the path to the modern economy: Lessons from medieval trade* (Cambridge University Press 2006) 29.

¹⁶¹ Robert Baldwin, Martin Cave and Martin Lodge, *Understanding regulation : theory, strategy, and practice* (2nd ed. / Robert Baldwin, Martin Cave, Martin Lodge. edn, Oxford University Press 2012)

in nominating regulators with interests that are different from their own. The second, labelled moral risk, arises whenever regulators drift from the principal's preferences after their appointment.¹⁶²

Several scholars have studied how this apparently conflicting relationship between principals and agents develops within the scope of regulatory frameworks. Numerous empirical studies have also been undertaken trying to understand from concrete cases whether agencies were actually independent and whether legislators, the Executive, or both, manage to exert control over regulatory outcomes or not. Three sets of conclusions can be derived from the literature.¹⁶³ A first group, which claims that regulatory agencies are basically independent, a second, which posits that principals can effectively control regulatory outcomes and a third presents arguments saying that control is possible but uncertain.

Among the group that concludes that control is possible, McCubbins et al. draw attention to agencies' and bureaucrats' tendencies to deviate from their legislative established objectives and claim that an effective solution to this problem is the establishment of rigorous administrative proceedings that reduce information asymmetries and create decision-making procedures to safeguard the original settings and exercise a higher degree of control.¹⁶⁴

Other authors claim that this deviation from principals' can be mitigated and significantly reduced through the creation of adequate institutional frameworks and agency design which prevent future political changes from affecting the original legislative understandings.¹⁶⁵ Among the authors who argue that control over agencies is not possible and that they tend to act independently from principals are Shapiro¹⁶⁶ and Wood.¹⁶⁷ Hammond and Knott¹⁶⁸ and Spiller¹⁶⁹ present evidence showing that control is possible but rather uncertain.

¹⁶² Mariana Batista da Silva, 'A Difusão da Regulação Governamental: uma resenha da literatura' (2008) 6 *Revista Habitus* 26.

¹⁶³ *Ibid.* 26.

¹⁶⁴ Robert Baldwin, Martin Cave and Martin Lodge, *Understanding regulation : theory, strategy, and practice* (2nd ed. / Robert Baldwin, Martin Cave, Martin Lodge. edn, Oxford University Press 2012) 28.

¹⁶⁵ *Ibid.*

¹⁶⁶ Stuart Shapiro, 'Presidents and process: A comparison of the regulatory process under the Clinton and Bush (43) administrations' (2007) 23 *JL & Pol* 393.

The Brazilian experience demonstrates that total independence is certainly rare and that the degree of governmental interference and control in regulated sectors tends to vary according to the strategic importance of the industry.¹⁷⁰ Control in key sectors is usual and does not necessarily represent a drawback, even considering impacts in terms of investments. What should be avoided, however, is the discretionary political interference in agencies and regulated policies that affect their credibility and the rule of Law. Another aspect illustrated by the Brazilian experience is the importance of taking into account the different focal points of influence and control coming from the Executive branch over regulatory agencies. In the oil sector, for example, the degree of control of the Ministry of Mines of Energy over ANP is small, while the opposite is true with respect to the Presidency of the Republic.¹⁷¹

Within the neo-institutionalist framework, some scholars widen the scope of the institutional context to include other aspects in their analyses such as courts, habits, balance of power, focusing on how regulatory actors react in these environments and how can they establish reliable commitments to the credibility of the regulatory policy.¹⁷² The main idea behind these studies is that regulated markets' industries normally have significant sunk costs¹⁷³ and operate in a highly politicised environment, since the provided services and goods bring substantial social benefits. Therefore, investments in these areas are considered very risky. To be able to ensure that they will be made in the desired amount to guarantee satisfactory development levels, host governments have to guarantee contractual and regulatory stability and a credible institutional environment. Hence, according to these authors,

¹⁶⁷ B Dan Wood, 'Principals, bureaucrats, and responsiveness in clean air enforcements' (1988) 82 *American Political Science Review* 213.

¹⁶⁸ Thomas H Hammond and Jack H Knott, 'Who controls the bureaucracy?: Presidential power, congressional dominance, legal constraints, and bureaucratic autonomy in a model of multi-institutional policy-making' (1996) 12 *Journal of Law, Economics, and Organization* 119.

¹⁶⁹ Pablo T Spiller, 'Politicians, Interest Groups, and Regulators: A Multiple-Principals Agency Theory of Regulation, or "Let Them Be Bribe"' (1990) *Journal of Law and Economics* 65.

¹⁷⁰ Cf. M Tina Dacin, Christine Oliver and Jean Paul Roy, 'The legitimacy of strategic alliances: An institutional perspective' (2007) 28 *Strategic Management Journal* 169; and W Richard Scott, *Institutions and organizations* (Sage 2001).

¹⁷¹ Cf. section 2.2.1.3.

¹⁷² Mariana Batista da Silva, 'A Difusão da Regulação Governamental: uma resenha da literatura' (2008) 6 *Revista Habitus*

¹⁷³ Sunk Costs are investments that once made cannot be used in alternative activities without significantly affecting their value.

the performance of agencies and their credibility cannot be exclusively determined by their institutional design and regulatory tools and has to take into account the wider institutional setting.¹⁷⁴

Supporters of this view tend to agree that regulation has a higher degree of credibility in countries with institutional settings that restrain political discretionary interference over regulatory agencies. In these cases, the possibilities of political opportunist behaviour are reduced and regulatory governance acts to the benefit of stable and predictable rules.¹⁷⁵

Institutional concepts have, without a doubt, brought significant contribution to regulatory theory, enriching its scope and promoting very fertile interdisciplinary debates. It has, importantly, shifted the centre of the discussions from an otherwise excessively economically oriented audience to a wider one that now prominently includes political scientists and socio-legal scholars. It also has significantly brought into focus the analysis of how procedural aspects influenced by the institutional setting affect regulatory outcomes. Yet it also has limitations. The first one derives from its excessively broad scope, since it is difficult to balance and take into account so many diverse and sometimes contradictory variables such as culture, politics and history, among others. As a result, most institutional studies have to limit their analyses to be able to make any kind of significant theoretical conclusions from reality. The second one relates to the excessive importance that is sometimes placed on the study of institutional credibility for regulation and for the preponderance given to investment attraction as one of the main focus of regulatory studies. Regulation has several other objectives apart from guaranteeing investment, which have to be adequately pondered and considered.

¹⁷⁴ Mariana Batista da Silva, 'A Difusão da Regulação Governamental: uma resenha da literatura' (2008) 6 *Revista Habitus*

¹⁷⁵ *Ibid.*

3.3 INTEREST THEORIES AND INSTITUTIONAL THEORIES IN BRAZIL

Brazilian scholars studying regulatory issues tend to concentrate on Institutional theories and delegation problems arising in specific industries.¹⁷⁶ Little attention as yet has been given to Interest and Normative theories. As previously stated, one distinctive feature of the Brazilian literature is the conclusion that the delegation process in the country mainly operates from the Executive branch to regulators, instead of having the Legislative as a starting point, as in the North American case. Mariana Prado explains the reasons:

“The fact that the executive branch was the main proponent of Independent Regulatory Agencies (IRAs) in Brazil and was the entity conducting the reforms shifts the focus of our attention to the President. In the United States, the prevalent theoretical approach to regulatory agencies is to model a principal-agent relationship between the regulatory agency (agent) and the entity that delegates its power (principal). In the American scenario, the principal is Congress, but in the case of Brazil it is the President.”¹⁷⁷

Despite this difference between the Brazilian and the North American models, Mariana Prado identifies the tendency in Brazil to copy American regulations through legal transplants without taking into account relevant domestic cultural, political and institutional aspects. She claims that this trend has considerably hindered some of the positive aspects of the American institutional design that aim to guarantee regulatory independence, when applied to Brazil. Mariana Prado demonstrates that conferring financial autonomy to agencies is one crucial aspect copied from the US as a means to guarantee agencies’ autonomy which has proved ineffective in Brazil.

The presidential control of the federal budget’s appropriation process and the possibility of limiting the transference of funds through presidential decrees were the institutional Brazilian peculiarities that led to the inadequacy of this transplantation, owing to a

¹⁷⁶ Ibid. 8,14.

¹⁷⁷ Mariana Mota Prado, ‘The Challenges and Risks of Creating Independent Regulatory Agencies: A Cautionary Tale from Brazil’ (2008) 41 *Vanderbilt Journal of Transnational Law* 445.

lack of national adaptations. Mariana Prado shows how the Brazilian Executive branch has significantly reduced the budgets of the National Telecommunication Agency and the National Electricity Agency between 2001 and 2005 through these measures.¹⁷⁸

Regina Silva Pacheco¹⁷⁹ and Lucia Helena Salgado¹⁸⁰ similarly refer to the Brazilian “one size fits all model” copied from the US as a major drawback in designing independent regulatory agencies in the country. They focus in more detail on the problems related to the use of the same institutional design for social and economic regulatory agencies in Brazil. Another drawback of the Brazilian experience, according to them, is the divestiture of state-owned assets and the implementation of privatisation programmes in most industries, without previously creating the institutional regulatory framework to foster competition and provide for the adequate protection of investors. Specialists in the field tend to agree on the need to avoid these situations, referring, in particular, to the negative experience of former European communist countries.¹⁸¹

Mariana Batista da Silva, while analysing more specifically the credibility of the Brazilian regulatory policy according to an institutional framework, questions the level of political interference in regulation in Brazil.¹⁸² She concludes that there is an excessive concentration of powers at the Executive branch, which could negatively impact on regulatory credibility. According to her, there are several incentives for the Executive to act opportunistically against the regulatory agency’s independence, such as establishing price caps to control inflation rates. Yet she claims that this power could in theory be adequately and effectively offset by the Judiciary branch, which acts independently in the country and is seen as a possible veto point on the Executive’s opportunistic moves.

¹⁷⁸ Ibid.

¹⁷⁹ Regina Silvia Pacheco, ‘Regulação no Brasil: desenho das agências e formas de controle’ (2006) 40 *Revista de Administração Pública* 523.

¹⁸⁰ Lucia Helena Salgado, ‘Agências regulatórias na experiência brasileira: um panorama do atual desenho institucional’ (2003) 941 *Texto para Discussão do IPEA*.

¹⁸¹ Mariana Mota Prado, ‘The Challenges and Risks of Creating Independent Regulatory Agencies: A Cautionary Tale from Brazil’ (2008) 41 *Vanderbilt Journal of Transnational Law*.

¹⁸² Mariana Batista da Silva, ‘O Desenho Institucional em Prática: uma Análise da Governança Regulatória e do Desempenho das Agências Reguladoras Brasileiras’ (2009) *Premio SEAE* 2010.

It is questionable, however, if the Judiciary can actually represent an effective veto point on the Executive in its populist drifts, especially in economic issues concerning regulatory aspects. As shown by Carlos Ari Sunfeld et al.,¹⁸³ most of the cases in which Executive action have been reviewed in the Supreme Court have resolved in favour of the Executive. Specifically in oil, case studies demonstrate that the Supreme Court has revealed a cautious stance and extreme reserve in interfering in determinations and regulations issued from the Executive branch and the ANP, focusing its analysis on formal procedural aspects.¹⁸⁴ This is exactly opposite to the trend in social areas, such as the health sector, where the Supreme Court has revealed an interfering attitude, carefully examining the subject matter under dispute and frequently obliging the Executive to provide specific medicines to individuals.¹⁸⁵ Research conducted in 2011 at the Supreme Court's electronic database identified only 148 decisions related to the oil sector.¹⁸⁶ Such number is undoubtedly tiny considering that the Supreme Court receives a yearly caseload average of 100,000.¹⁸⁷ Most of these lawsuits refer to appeals against ANP fines in inspections related to the quality of fuel in gas stations and to cases related to civil servants' national public contests results in entities of the oil sector. In the few lawsuits with potential to impact on oil policy, the Supreme Court has refused to enter into consideration of their subject matter and has rather restricted itself to the analysis of strict legality. In some cases this non-interference is justified with statements such as "political decisions" taken by the executive should not be re-evaluated by the Judiciary branch.¹⁸⁸

¹⁸³ Carlos Ari Sunfeld and others, 'O Controle de Constitucionalidade dos Atos do Poder Executivo' (2010) 30 *Serie Pensando o Direito* 1.

¹⁸⁴ Pedro de Abreu e Lima Florencio, 'Supreme Court Decisions with Regard to the Brazilian Oil Sector' (2013) *International Energy Law Review* 18.

¹⁸⁵ Octavio Luiz Motta Ferraz, 'Harming the poor through social rights litigation: lessons from Brazil' (2010) 89 *Texas Law Review* 1643.

¹⁸⁶ 111 monocratic decisions, 19 coming from the President of the Supreme Court and 18 collegiate ones. The research was conducted using the word ANP at the Supreme Court's database: <http://www.stf.jus.br/portal/jurisprudencia/pesquisarjurisprudencia.asp>. The main assumption was that any oil case with potential impact on energy policy would have ANP's involvement because of its regulatory attributions and its role as implementer of the policy according to Article 8 of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997). Cf. Pedro de Abreu e Lima Florencio, 'Supreme Court Decisions with Regard to the Brazilian Oil Sector' (2013) *International Energy Law Review* 18.

¹⁸⁷ The average uses data from 2000 to 2009, available from the Supreme Court's website: [http://www.stf.jus.br/portal/cms/verTexto.asp?servico=estatistica &pagina=movimentoProcessual](http://www.stf.jus.br/portal/cms/verTexto.asp?servico=estatistica&pagina=movimentoProcessual), accessed on 7 January 2013.

¹⁸⁸ Pedro de Abreu e Lima Florencio, 'Supreme Court Decisions with Regard to the Brazilian Oil Sector' (2013) *International Energy Law Review* 18.

Mariana Batista also analyses the formal institutional design of regulatory agencies in Brazil, attempting to measure their independency levels through an assessment of their legal framework. She infers that Brazilian agencies are institutionally designed in an adequate manner to guarantee their independence. However, since legal regulatory provisions are considered open and vague, they leave quite significant room for the Executive branch to act opportunistically.

Her conclusions with respect to the vagueness and openness of provisions are particularly relevant in the oil sector, where some statutes even involve the interpretation of some complex economic concepts such as monopoly, for example.¹⁸⁹ To a certain degree most economic Law rules have this feature, since they apply to the economic context, which is in constant evolution and change, as noted by Teubner.¹⁹⁰ When considering the level of political interference in regulatory agencies, Mariana Batista¹⁹¹ and Bernardo Mueller and Carlos Pereira conclude that the ANP is the agency that has most suffered political intervention from 1998 to 2008.¹⁹²

If this more interfering stance on the part of the state in the oil sector took place in the government of President Cardoso, President Lula da Silva and President Dilma Rouseff, since her inauguration in 2010, have followed and reinforced it. Apart from the 2010 changes to the regulatory framework to ensure even greater state control over exploration and production, President Rouseff has also been more categorical in her own ascendancy over Petrobras than in other state-owned enterprises. One clear sign of this objective was the appointment of a personal friend as President of Petrobras.¹⁹³

¹⁸⁹ Article 177 of the Constitution of the Federative Republic of Brazil (Constituição da República Federativa do Brasil) and Chapter III of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997).

¹⁹⁰ Gunther Teubner, 'Global bukowina: Legal pluralism in the world-society' in Gunther Teubner (ed), *Global Law Without a State* (Ashgate Publishing Company 1996).

¹⁹¹ Mariana Batista, 'Mensurando A Independência Das Agências Regulatórias Brasileiras' (2011) *Planejamento e Políticas Públicas* 213.

¹⁹² Bernardo Mueller and Carlos Pereira, 'Credibility and the design of regulatory agencies in Brazil' (2002) 22 *Brazilian Journal of Political Economy* 65.

¹⁹³ President Dilma Rouseff appointed Maria das Gracas Foster as President of Petrobras on 13 February 2012.

3.4 REFLEXIVE AND RESPONSIVE THEORIES

Reflexive and Responsive theories are conceptual perspectives that transcend discussions rather predominant in Normative and Interest theories over the desirability of regulating or deregulating a certain industry or sector. These approaches, which take into account the continuous and fertile interactions among different group of stakeholders and systems, tend to envisage a possible middle path between these two extreme perspectives. They advocate a versatile, self-imposing and non-intrusive standpoint towards regulations.

3.4.1 RESPONSIVE REGULATION

Responsive regulation is a conceptual framework advocated by Ayres and Braithwaite, which questions the dichotomy existent between the free market and state regulation. It advocates a regulatory perspective combining state and private regulations, including public, private and soft laws. Ayres and Braithwaite claim that the modern world is complex and has several stakeholders and interest groups that continuously interact in an environment in which regulation, deregulation and re-regulation are simultaneously taking place. They contend that we live in “an era of regulatory flux”¹⁹⁴ where all the spheres of institutional regulatory power constantly interact, legitimising and challenging each other.¹⁹⁵

Responsive regulation establishes an important role for the state in empowering private interest groups in regulated sectors, fostering the congregation of interests, civil society’s participation and its engagement to enrich governance structures, promoting effective mechanisms of checks and balance. This is a view in line with the idea of “republicanism”, to which the authors subscribe.¹⁹⁶ They argue that the state should attempt to foster and introduce mechanisms of self-regulation, according to the principles of democratic republicanism.¹⁹⁷

¹⁹⁴ Ian Ayres and John Braithwaite, *Responsive regulation: transcending the deregulation debate* (Oxford University Press 1992) 14.

¹⁹⁵ Ibid. 14.

¹⁹⁶ Ibid. 18.

¹⁹⁷ Ibid. 101,133.

One of the essential dilemmas of regulation, according to Ayres and Braithwaite, is how to entice collaborative and participatory initiatives, avoiding at the same time capture and corruption. They claim that the exact same aspects that contribute to participation also lead to regulatory capture and malfeasance. According to them: "This is the policy we seek to crack. How do we secure the advantages of the evolution of cooperation while averting the evolution of capture and corruption?"¹⁹⁸

As a response, Ayres and Braithwaite propose a three-tiered empowerment model of public interest groups (PIGs) which provide: i) their access to all the regulator's information; ii) a place at the negotiating table whenever deals are concluded; and iii) equal powers to the regulator to sue and/or prosecute.¹⁹⁹ According to them, PIGs' main function is, therefore, to act as a third player between regulators and regulated actors, undertaking the necessary punitive actions whenever required. PIGs would exert the function of enforcers of a metanorm whenever the two other groups do not comply with established regulations and norms. The mere existence of these punitive actions and oversight would contribute to compliance while also allowing PIGs to participate in the regulatory process, providing the necessary feedback to regulators towards its increased effectiveness.

Yet the authors contend that two important problems arise in such contexts. The first is called the failure of trust problem, captured in the question of who guard the guardians?²⁰⁰ It essentially questions the paradox in dealing with problems of trust by increasingly adding custodians. In other words, if PIGs monitor regulators and regulated entities, who exerts oversight on the PIGs? Such questions could be asked indefinitely. The second is how to appropriately choose PIGs to be empowered?

To tackle the first problem, Ayres and Braithwaite propose to promote open competition among PIGs, fostering their contestability in such manner that they are constantly

¹⁹⁸ Ibid. 56.

¹⁹⁹ Ian Ayres and John Braithwaite, *Responsive regulation : transcending the deregulation debate* (Oxford University Press 1992), 57.

²⁰⁰ Ian Ayres and John Braithwaite, *Responsive regulation: transcending the deregulation debate* (Oxford University Press 1992).

monitored, scrutinised and challenged. Concerning the second question, there can be several answers. In a simplest model of empowerment, the state would select the best PIG to exert the functions. Despite acknowledging the limitations of this simplest form, Ayres and Braithwaite recognise that it favours swift deliberations in situations where no decision making at all would be an inferior alternative. Ideally, according to them, PIG selection would depend on each institutional and historical context.²⁰¹

Another essential aspect of responsive regulation is that it proposes a regulatory strategy in which state intervention through command and control initiatives is avoided and only used as a last resort. Ayres and Braithwaite contend that self-regulation and enforcement strategies based first on persuasion attract less resistance from regulated companies, fostering collaboration and demanding fewer resources.²⁰² Yet they only function appropriately if the regulated firms know beforehand that regulators can resort, if needed, to more intrusive models and punitive measures, which is the idea behind the metaphor of the “benign big gun”.²⁰³

Against this backdrop, they propose a regulatory approach that progressively scales a pyramid, departing from the previously mentioned situation of self-regulation and persuasion towards increasing levels of state intrusiveness and command and control regulations, with punishment and maximum social control located at its apex. The ascendancy of the pyramid would essentially depend on the regulated sector’s acceptance of and compliance with the respective strategies.

As will be demonstrated throughout the thesis, responsive regulation is a quite useful model for Brazil after the 2010 reform, which is considered excessively intrusive and does not contribute to collaboration and cooperation of regulated entities. Ayres and Braithwaite’s conceptual framework is also compelling because it overcomes the excessively reductionist liberal notion that the provision of rules and rights, especially for the disadvantaged, are enough

²⁰¹ Ibid. 58.

²⁰² John Braithwaite, ‘Responsive regulation and developing economies’ (2006) 34 World Development 884, 896.

²⁰³ Ian Ayres and John Braithwaite, *Responsive regulation: transcending the deregulation debate* (Oxford University Press 1992) 19,53.

to remedy regulatory failures and problems.²⁰⁴ They show that empowerment of interest groups is an essential aspect of regulation and in some instances excessive rules, norms and punishments are counterproductive and costly.

Yet one of the theory's limitations is related to its difficult applicability and with the problems in creating the appropriate networks of governance for each sector.²⁰⁵ Such actions involve very complicated decisions and efforts of institutional design aimed at the empowerment of the appropriate public interest groups. It is no mere coincidence that Ayres and Braithwaite recognise the limitations in deciding which PIGs should be empowered. Contestability and constant competition of other PIGs, in turn, might not take place at all because of the several problems in organising and maintaining social interest groups and in providing effective mechanisms for civil society's participation. At the end of the day, picking and choosing adequate public interest groups and forming governance networks for each regulated sector could simply be another form of state intrusiveness that could lead to corruption and fallouts without contributing to cooperation and inclusiveness.

3.4.2 REFLEXIVE REGULATION

Reflexive regulation is a theoretical concept proposed by Gunther Teubner based on Niklas Luhmann's systems theory.²⁰⁶ Luhmann argues that social systems are systems of communication, which select a limited amount of information to define themselves in contrast to the environment in which they are inserted. Therefore, communication is an essential aspect of a system's definition, since it performs the important task of reducing complexity with respect to the external world. This process of complexity reduction from a chaotic and unintelligible situation is called "autopoiesis".²⁰⁷

²⁰⁴ Ibid. 59.

²⁰⁵ John Braithwaite, 'Responsive regulation and developing economies' (2006) 34 World Development 884, 894.

²⁰⁶ Cf. Gunther Teubner, *How the law thinks: toward a constructivist epistemology of law* (Springer 1990); Gunther Teubner, 'After legal instrumentalism' (1986) Dilemmas of law in the welfare state 299; and Gunther Teubner, *Law as an autopoietic system* (Oxford/Cambridge, Blackwell Publishers 1993).

²⁰⁷ Niklas Luhmann, 'Law as a social system' (1988) 83 Northwestern University Law Review 136.

Each system functions according to its own proper codes, its language, which are continuously replicated and reproduced through autopoietic closure processes. Because of such autopoietic closure, systems operate following communication codes and are unable to understand other systems' codes. Considering, for example, that economics and Law are both different social subsystems, the theory argues that they operate according to their own logic and do not make sense of each other. According to Teubner, the legal subsystem is defined by a binary code of legality and illegality, while the economic subsystem is essentially defined by a binary code of payment and non-payment, which follows the language of prices.

Even though social systems are diverse and unintelligible to each other, they do interact, absorb external features and evolve from such interactions. This happens because despite being operationally closed, social systems are cognitively open, which allows them to take into account perturbations from the external world through a process that Luhmann called "structural decoupling".

Against this backdrop, Teubner contends that Law as a social subsystem should not attempt to influence other subsystems through command and control structures, dictating its own language or logical reasoning because the targeted settings are essentially different and operationally closed subsystems, which do not comprehend the legal communication logic. Three problems may arise in these cases, according to Teubner:

- 1) the Law might not have any influence over the social conduct;
- 2) it may distort the practice through incompatible requirements; or
- 3) the legal rule may lose its own consistency and coherence by attempting to incorporate other elements into its logic.²⁰⁸

These three problems, which Teubner calls the regulatory trilemma, can only be avoided, according to him, through the use of reflexive regulation. In strict opposition to command and control models, reflexive regulations advocate the use of self-regulation in an attempt to avoid the regulatory trilemma.

²⁰⁸ Gunther Teubner, 'After legal instrumentalism' (1986) *Dilemmas of law in the welfare state* 299.

Under this reflexive regulation logic, Teubner claims that Law should ideally contribute to the internal communication of systems and facilitate their coordination.²⁰⁹ Whenever such principles are neglected and extrinsic objectives are inserted in legal commands directed to a certain setting through intrusive regulations that do not take into account its functioning logic, incompatibilities, setbacks and diversions will inevitably follow because of the conflicting realities of divergent systemic discourses.²¹⁰ Therefore, reflexive regulation advocates the indirect influence of norms, inducing agents to continuously interact in a favourable way for the intended outcomes instead of imposing a certain conduct.²¹¹

Analysing the oil sector according to a reflexive regulation and systems theory perspective, the conclusion is that it holds features of an autopoietic subsystem. It is essentially a self-referential setting, which uses its own procedural logic and communication rationale to differentiate itself from the environment in which it operates. The oil sector has its own language, its intrinsic logic of self-reproduction, which is operationally closed to other systems, even if maintaining considerable cognitive openness towards the environment where it is inserted. The oil sector essentially functions according to a logic of oil utility extraction. Within this logic, it builds its own structure of meanings, its peculiar language, according to which it interprets the world. Therefore, all elements revolving around the idea of usefulness of tapping oil would be included in the oil sector subsystem in the same way as the legal system is constructed according to the binary code of legality and illegality.²¹²

Before a person starts studying the oil sector, she/he has to be introduced to certain concepts to be able to minimally understand it. Normally books related to oil come with a glossary, appendices or notes that detail expressions and measures, which are normally in English but identifiable to all those operating in the sector, irrespective of nationality. Expressions such as onshore, offshore, logging, government take and reserves, for example, cut

²⁰⁹ Cf. Gunther Teubner, *Law as an autopoietic system* (Oxford/Cambridge, Blackwell Publishers 1993); Gunther Teubner, *How the law thinks: toward a constructivist epistemology of law* (Springer 1990); Gunther Teubner, 'After legal instrumentalism' (1986) *Dilemmas of law in the welfare state* 299.

²¹⁰ Gunther Teubner, *How the law thinks: toward a constructivist epistemology of law* (Springer 1990).

²¹¹ Gunther Teubner, *Law as an autopoietic system* (Oxford/Cambridge, Blackwell Publishers 1993).

²¹² In this sense, this would be the binary code determining the oil sector sub-system just as the legal/illegal code determines the Law system, according to Luhmann.

across different disciplines but are equally understood by all those in the oil segment. In economics, for example, the study of oil is so particular that it is commonly referred to as “oil economics”. In Law, similarly, such specificities have led to the creation of “oil Law” in some universities, which include it in their curriculum. An increasing number of oil dictionaries and glossaries²¹³ actually reveal the emergence of a specific form of communication in the sector, while some specialists have even started studying the influence of “petro-linguistics” in national languages and their impact on cultural identity.²¹⁴

Hence, considering that the oil sector holds elements of an autopoietic setting²¹⁵, with its own logic and communication rationale, the main goal for regulations according to a reflexive and systems theory standpoint should be to foster adequate policy developments, avoiding as much as possible distortions and impairments that derive from excessive external intrusion in this regulated social subsystem. Regulations must co-evolve with the system to which they apply, in a process of “reciprocal structural coupling”.²¹⁶ They ought to indicate directions and guidelines, without operationally interfering in settings that function according to their own and unique logic.²¹⁷

Against this backdrop of reflexive regulation, norms should essentially facilitate the coordination and coupling between systems, avoiding incongruences and incompatibilities. Since the oil sector is essentially mutable, the potential for conflicts is even higher. Therefore, the reflexive theoretical framework regulatory approach in such a changing sector, which stems from indicative orientations and guidelines that indirectly influence the aimed outcome, with minimal intrusiveness and constant adaptability, is quite suitable for several of its aspects. Such

²¹³ Cf. Lalia Phipps Boone, *The petroleum dictionary* (University of Oklahoma Press 1952); and Schlumberger, ‘Oilfield Glossary’ <<http://glossary.oilfield.slb.com/>> accessed 20 June 2015.

²¹⁴ Cf. Suhail Karmani, ‘Petro-linguistics: The emerging nexus between oil English and Islam’ (2005) 4 (2) *Journal of Language, Identity & Education* 87 Ahmar Mahboob and Tariq Elyas, ‘English in the Kingdom of Saudi Arabia’ (2014) 33 *World Englishes* 128.

²¹⁵ According to Niklas Luhmann, ‘Law as a social system’ (1988) 83 *Northwestern University Law Review* 136, autopoiesis is a procedure of filtering and processing of information from the environment that defines a certain system.

²¹⁶ Gunther Teubner, *Law as an autopoietic system* (Oxford/Cambridge, Blackwell Publishers 1993) 52, 53.

²¹⁷ Ana Lourenço, ‘Autopoietic Social Systems Theory: The Co-Evolution of Law and the Economy’ (2010) 35 *Australian Journal of Legal Philosophy* 35.

an approach is specifically appropriate for technology and innovation, since they are increasingly dependent on network structures of a changing and often unpredictable nature, as will be demonstrated in chapter 8.

Yet reflexive regulation also reveals limitations. The two most important ones for this thesis are first the excessively abstract nature of the conceptual framework and the difficulty in translating it into a set of consistent and concrete systematic policies of effective applicability. The second is that in the contemporary real world systems are much more open than advocated by Luhmann and Teubner because of the scale, speed and constancy of interactions between them, in the most diverse circumstances. As pointed out by Braithwaite, individuals exert diverse and multiple roles according to the different situations they encounter.²¹⁸ If systems were in fact as operationally and normatively closed as advocated by Luhmann and Teubner the amount and intensity of social exchanges would be significantly reduced and more complicated. Actually it is quite common for economists, lawyers and political scientists, for example, to share the same discussion table without excessive impediments, discussing issues to which they bring quite easily the specific expertise of their areas. Postgraduate courses in some countries, similarly, do not even require a previous specialised training in their field of expertise. These examples seem to indicate that probably systems are more open than Luhmann and Teubner suggest.

3.5 CONCLUSION

As expected, all conceptual frameworks have their own advantages and drawbacks. Within this setting and since the topic of this thesis is diverse and essentially multidisciplinary, there isn't an aprioristic choice of one specific theoretical model. Rather, the thesis attempts to evaluate what is the theory that best explains the different examined situations in each of the following chapters and what are those that can make better recommendations in Part III. The essential understanding is that no single conceptual framework explains the Brazilian oil sector

²¹⁸ John Braithwaite, 'Responsive regulation and developing economies' (2006) 34 World Development 884, 885.

in all its complex dimensions and is able to provide a unique and adequate response to its problems.

As already mentioned, three specific conceptual frameworks will be more constantly referred to: the institutional, responsive and reflexive theories. These theories are deemed more important for the current setting of the Brazilian oil sector, which requires more adaptable and flexible norms that take into account the implicit influences of the changing institutional environment. The first theory will be particularly relevant to grasp the underlying incentives and disincentives of the different oil sector stakeholders to each of the regulatory settings and situations. This approach will be important when assessing specific governance structures of the 2010 regulations, such as the operational committee of Law 12,351, for example.

The responsive regulation theory is useful to analyse and understand the lack of interaction among stakeholders in the current regulatory structures in Brazil and the problems derived from that. It demonstrates the advantages of departing from less intrusive and punitive regulatory models before resorting to more interfering settings. Differently from the Norwegian experience, which can be closely identified with such conceptual framework, since it entices different players to closely interact in a participatory manner, the Brazilian regulatory framework does not promote systematic and close interconnections between the different sectoral and institutional agents. Such limitation leads to drawbacks that are identified throughout the thesis.

The reflexive conceptual framework is particularly useful to contrast the logic of these two other theories, which are excessively based on input/output models stemming from regulations' incentives and disincentives coming from the economics subsystem. Even though Teubner and Luhman argue that the binary code for the economics subsystem is based on payments and prices, it is actually dependent on incentives and disincentives. Everything in economics can in fact be translated into these two dimensions, including payments and prices, which are specific forms of incentives and disincentives. The same applies to the other relevant variables used in the discipline such as profits, costs, wages, interest rates and so forth. This

binary code of incentives and disincentives, as used in the institutional and responsive frameworks, takes into account straight and linear responses to previous stimuli, which is the mainstream logic of “Law and economics”.²¹⁹

Social systems theory debunks this direct one-way relationship, advocating, instead, a two-way interaction based on structural coupling.²²⁰ Hence, rather than claiming that a certain rule impacts another setting, leading to a specific social behaviour, social systems theory would argue that the rule causes perturbations on another social subsystem, being absorbed and translated by it according to its own logic. This perturbation assimilation within the affected subsystem, would, in turn, determine a specific social outcome.²²¹ Such perspective is actually more comprehensive than the one way consequential reasoning of the other two theories and allows taking into account other aspects that are sometimes ignored in straightforward input-output model.

Hence, while the institutional and responsive frameworks are essentially based on economic and consequential impact rationales, taking into account how structures react to stimuli, the reflexive model supposes an interactive logic of assimilation of external impacts which are adapted to different contexts and realities. Another important difference between the first two theories and the reflexive conceptual setting is that the latter framework deems command and control regulations as essentially deficient. Therefore, it does not consider their use, not even as a last resort possibility, as does the responsive theory. Despite the problems associated with command and control norms, as well posed by reflexive theorists, in some extreme case scenarios and situations of anomie and disrespect of the rule of law they might be the most effective and appropriate answer to these problems.

In spite of these differences, one of the common grounds of the three main frameworks adopted in the thesis’ analysis is their wide regulatory ambit, compared to the traditional regulatory theories of narrower scope. As a result, these theories also acknowledge that

²¹⁹ Ana Lourenço, ‘Autopoietic Social Systems Theory: The Co-Evolution of Law and the Economy’ (2010) 35 Australian Journal of Legal Philosophy 35.

²²⁰ Ibid.

²²¹ Ibid.

regulation tends to operate in different and mutable fora, at different levels, with involvement of different organisations of various nature, which are in constant interaction. They hence recognise regulation's inherent tendency to "polycentricity" and "hybridity", paradoxically creating, in some cases, simultaneous processes of institutional centralisation and decentred regulation.²²²

The acknowledgement of such situations have led to proposals that advocate the creation of "meta-regulators" to monitor non-state regulators, leaving the traditional central government as mainly responsible for giving the main policy direction, exerting a typical steering function.²²³ In a similar vein, "risk based regulation" also recognises the existence of several regulatory nodes in the contemporary world and the limitations of providing effective state action in all of them. The theory thus seeks to prioritise state regulation in areas which pose the highest challenges and risks to the fulfilment of its goals.²²⁴ While such approach might be procedurally compelling, denoting policy pragmatism, it may also have the undesirable consequence of reducing the level of political accountability, since regulators might consider in such contexts that regulatory failures are events beyond their control and for which they cannot be held to account.²²⁵

Finally, new approaches in regulation have been recently considered in legal theory, criticising the top-down command and control traditional model, incorporating several elements of responsive and reflexive theories and widening the scope of the analysis to essentially concentrate on multi-layer governance settings. Lobel, for example, advocates a paradigm shift from what he calls traditional regulatory model to a new governance model.²²⁶ While the former is based on strict, rigid and fixed commands coming from the top in a hierarchized manner, the latter is based on decentred flexible procedures essentially

²²² Julia Black, 'Tensions in the regulatory state' (2007) Public Law 58, 73.

²²³ Ibid.

²²⁴ Elizabeth Fisher, *Risk regulation and administrative constitutionalism* (Bloomsbury Publishing 2007).

²²⁵ Ibid.

²²⁶ Orly Lobel, 'The renew deal: the fall of regulation and the rise of governance in contemporary legal thought' (2004) 89 Minnesota Law Review 7.

determined by multiple levels of governance interplay.²²⁷ Collin Scott similarly recognises a shift in traditional models of formal state regulation towards regulatory governance settings that increasingly take into account the influence of networks and communities, in which regulatory activity is performed in a diffuse and interactive manner.²²⁸

²²⁷ Ibid.

²²⁸ Colin Scott, 'Regulatory governance and the challenge of constitutionalism' (2010).

This chapter analyses international experiments in regulation of the oil sector aiming to extract useful lessons and experiences for Brazil and the study performed in Part II of the thesis. The first section of the chapter gives an overview of the different international governance structures and regulatory frameworks in the oil sector, providing country specific examples. The assessment of international institutional designs will be performed through the analytical lenses of national oil companies (NOCs), examined within their respective governance settings.

The study of governance structures and institutional designs of the oil sector is considered extremely difficult. There are a great variety of frameworks around the globe, with different settings, which makes the examination of local realities particularly important. Yet the more one advances on the details and local nuances, the more comparability is compromised and increasing efforts are necessary to draw any kind of general robust conclusion.²²⁹ By pinning down the analytical approach on national oil companies the aim is to confer greater clarity and organisation to the analysis without losing track of local particularities. Such approach has also the advantage of facilitating comparisons of these entities' governance experiences with Petrobras to extract useful lessons and to be able to make effective policy recommendations in Part III of the thesis.

The second section of the chapter focuses on the Norwegian regulatory framework. Norway has been chosen as a specific case study because it is considered an international benchmark in oil exploitation. Its regulatory framework is frequently mentioned in the literature as an adequate model of institutional checks and balances to the benefit of resource appropriation. It is also considered a successful example in the use of a non-renewable natural resource to the overall benefit of the country.²³⁰

²²⁹ David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 13.

²³⁰ Cf. Richard Gordon and Thomas Stenvoll, 'Statoil: A study in political entrepreneurship' (The Changing Role of National Oil Companies in International Energy Markets, 2007); Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' in *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011); and

Norway has adopted a concession regime based on licenses, similar to the model used in Brazil since 1997.²³¹ The fact that the country's oil production has already attained the maturity phase also allows a richer assessment of its framework in different moments and gives a clearer picture of how the regulations have evolved in response to the different production phases. This analysis provides very useful and enriching insights for nations in their initial production stages, such as Brazil.

In spite of these aspects, the comparison between Brazil and Norway has to be done very carefully to take into account the significant differences between these two nations. Norway is a small country with a tiny population, which was already developed and had high social standards when its main oil reserves were discovered. Brazil, in contrast, is a big emerging populous nation with substantial social disparities. Such differences partially explain the importance that Brazil gives to the strategic control over oil and to the state's urge in appropriating the proceeds from its exploitation. It also explains why discussions over the Norwegian regulatory framework were conducted at a slower pace, mainly guided by technocrats that carefully presented the technical arguments to politicians, while in Brazil it has mainly been politically led and centred around the distribution of resources among federal entities, as the following sections demonstrate.

4.1 INSTITUTIONAL DESIGN

The initial aspect to be considered in relation to institutional design is that there isn't an inherent superiority of one model with respect to others. Each system has its own advantages and drawbacks, according to different circumstances and specific national realities. It is therefore no coincidence that nations using totally opposite models, such as Norway and

Oystein Noreng, 'Brazil and Norway- Offshore Petroleum Experiences and Lessons' (2009) 35 *Journal of Energy and Development* 79.

²³¹ See Appendix for further information on the different types of regulatory regimes around the world.

Malaysia, are both considered quite successful international examples in terms of exploitation of oil.²³²

Countries with the most comprehensive and complex institutional structures in the oil sector normally have five different types of entities: i) a sectoral ministry, usually the ministry of petroleum; ii) a regulatory agency; iii) a national oil company; iv) international oil enterprises; and v) supplier and service corporations. Brazil and Norway are the paradigmatic examples of this type of organisation. On the other side of the spectrum, Malaysia has a quite simple institutional design with a national oil company directly linked to the Prime Minister, holding all regulatory functions.²³³

In Norway, the regulatory institutional design neatly separates the regulatory, operational and policy formulation functions between entities: the Norwegian Petroleum Directorate (NPD), the national oil company – Statoil – and the Ministry of Petroleum. This clear-cut division is intended to avoid situations of policy conflict that could lead to confusion and inefficiency. It also aims to emulate the right checks and balances among entities, enticing them to control and exert oversight on each other.

The creation of the State Financial Interest (SDFI) in 1985 is an example of this Norwegian concern and also shows the prevailing preoccupation in curbing excessive state corporate power. In the 1980's there was growing scepticism over the amount of effective control over Statoil, which was thought to have become too powerful. International oil companies (IOCs) particularly invoked the company's special preferences and veto power on operational projects, because of its minimum 50% participation right in all licences, as a hindrance to further private investment.²³⁴ Civil servants, on the other hand, advocated the need

²³² David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011).

²³³ Leslie Lopez, 'Petronas: reconciling tensions between company and state' in David G Victor, David R Hults and Mark C Thurber (eds), *Oil and Governance* (2012) 821.

²³⁴ David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 599,655.

for increasing separation and distinction between the political, commercial and financial roles of institutions in the oil sector.²³⁵

Therefore, SDFI was mainly created to overcome these problems and received 50% of Statoil's interests in all oil fields. The NOC's veto power over future licences was also eliminated. SDFI is today essentially an accounting mechanism in the Norwegian national budget which assigns to the state a participation right in all oil concession areas and is administered by a fully state-owned company: Petoro. Its creation separated corporate-operational functions and financial-asset tasks between Statoil and SDFI.²³⁶

Malaysia, Indonesia (until 2001) and Libya, on the other hand, are examples of institutional settings where the national oil company essentially holds regulatory powers, formulates policies and responds directly to authorities of the Executive branch above the ministerial level that do not hold sectoral functions. In Malaysia, as mentioned, the national oil company Petronas holds all these tasks and answers directly to the Prime Minister. In Libya, after the extinction of the Ministry of Energy in March of 2006,²³⁷ its National oil corporation has been linked to the General People's Committee, which is the main executive body in the country. The Indonesian NOC, Pertamina, until 2001 also reunited regulatory, administrative and policy formulation functions and despite being formally linked to the Ministry of Mines and Energy, in practice responded directly to the President.²³⁸ Such institutional design changed in 2001, with the creation of a regulatory agency, BP Migas, which aimed at eliminating the conflict of interests that arose within Pertamina for its joint activities as oil producer and regulator.²³⁹

²³⁵ Ibid.

²³⁶ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 214.

²³⁷ Ibid. 183.

²³⁸ Donald Hertzmark, 'Pertamina: Indonesia's State-Owned Oil Company' (The Changing Role of National Oil Companies in International Energy Markets, 2007) 27, 28.

²³⁹ Cf. Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 145; and Donald Hertzmark, 'Pertamina: Indonesia's State-Owned Oil Company' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

In the midway position between this last group of countries and the first ones, are nations such as Angola²⁴⁰ and Iran,²⁴¹ which have institutional architectures with a national oil company mainly holding implementation functions and linked to a sectoral ministry, normally the Ministry of Petroleum.

In view of the importance that NOCs have assumed lately and because of their role in defining different institutional settings, the next section will analyse them in more detail. The study attempts to enquire further on the realities of such enterprises examining internal and external governance structures.

4.2.1 NATIONAL OIL COMPANIES: IMPORTANCE, DILEMMAS AND CHALLENGES

The study of NOCs has become increasingly important in the last years. These companies are progressively acquiring worldwide relevance as they control most of the current reserves around the globe and have become the major world producers. State-owned enterprises (SOEs) figure among the 10 top reserve holders with control over 73% of the global proved oil reserves and 61% of production.²⁴² Fourteen out of twenty main oil producers are NOCs,²⁴³ while forecasts from the International Energy Agency (IEA 2008) estimate that they will be responsible in 2030 for almost 80% of the increase in global oil and gas output.²⁴⁴

NOCs' goals largely differ from IOCs' since they include several non-commercial aspects beyond shareholders' returns and company profitability, such as oil wealth distribution, energy security, industrialisation and economic development. Shleifer and Vishny argue that state enterprises tend to overemploy at higher wages and alternate their pricing policies between levels below marginal cost, to gain political support, and monopoly prices, to extract extra

²⁴⁰ Cf. Patrick Heller, 'Angola's Sonangol: Dexterous Right Hand of the State' in David G Victor, David R Hults and Mark C Thurber (eds), *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2012) and Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 70.

²⁴¹ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 164.

²⁴² David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 3.

²⁴³ Baker Institute, 'Baker Institute Policy Report' (The Changing Role of National Oil Companies in International Energy Markets, 2007) 1.

²⁴⁴ David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 8

rent.²⁴⁵ Hartley and Medlock present empirical evidence showing that NOCs are less revenue efficient than IOCs essentially because of these practices.²⁴⁶

Such policies of maintaining artificially low national oil prices are quite common among national oil companies and one of the problems faced by oil producer countries. Despite their advantages in providing access to cheap energy sources for industrial policy purposes and in avoiding excessive price fluctuations, they can drain important resources from the companies, and lead to an artificial demand escalation in energy intensive sectors. This increased artificial demand can discourage the pursuit of energy efficiency. It could also lead to the need for importing the product, as in Iran, for example.²⁴⁷ The exact same policies had disastrous effects in Nigeria causing widespread fuel shortages.²⁴⁸

Such examples show how important it is for NOCs to also pursue commercial goals and to avoid policies that lead to excessive distortions in allocative efficiency. However, even though commercial operational goals are essential for NOCs, their importance should not be exaggerated or excessively outweigh other legitimate objectives, which normally constitute an essential component of their social role and importance to their countries. Several NOCs have crucial public goals such as wealth distribution, economic development, promotion of national infrastructure and technology, which are often ignored and underestimated in corporate efficiency analyses.

What the case studies show, however, is that these non-commercial goals can be best served if they reveal long-term sustainability, without being distorted by short-term political demands that excessively drain corporate resources.²⁴⁹ Statoil and Petronas (Malaysia) provide illustrative examples of how to balance non-commercial and commercial objectives without

²⁴⁵ Andrei Shleifer and Robert W Vishny, 'Politicians and firms' (1994) *The Quarterly Journal of Economics* 995.

²⁴⁶ Stacy L Eller, Peter R Hartley and Kenneth B Medlock, 'Empirical evidence on the operational efficiency of National Oil Companies' (2011) 40 *Empirical Economics* 623.

²⁴⁷ Baker Institute, 'Baker Institute Policy Report' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

²⁴⁸ *Ibid.*

²⁴⁹ *Ibid.*

compromising corporate efficiency and performance.²⁵⁰ Statoil considerably contributed to developing the national supply oil industry in Norway through rational industrial policies of national content.²⁵¹ Malaysia successfully used Petronas to expand and promote its image abroad and to develop links with other countries.²⁵² Pertamina (Indonesia) and NNPC (Nigeria), on the other hand, show a record of misuse of public funds for short-term and non-commercial purposes that significantly affected the companies' long-term results.²⁵³

Eller, Hartley and Medlock's econometric analysis also demonstrates that NOCs are more likely to underinvest on reserves and to value present resources over future ones, compared to their private counterparts. They contend that the political interests of directors and managers, who want to benefit from oil's financial proceeds while still in office, would act as a deterrent to policies and projects of longer maturity.²⁵⁴

Yet this inference does not apply to companies such as Petrobras and Statoil, which have undertaken significant investments of long-term return throughout their history. Eller, Hartley and Medlock's conclusions are based on statistics of several NOCs without however differentiating them appropriately, according to their particularities and specific national contexts. As a consequence, their results have been excessively generalised. A more careful assessment of the realities of the companies would recommend separating them into different groups or clusters, according to some of their important features, such as private ownership of shares, for example. If that had been done, some categories of NOCs such as Statoil, or even

²⁵⁰ Ibid.15.

²⁵¹ Cf. Richard Gordon and Thomas Stenvoll, 'Statoil: A study in political entrepreneurship' (The Changing Role of National Oil Companies in International Energy Markets, 2007); Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' (Program on Energy and Sustainable Development : Working Paper 92, 2010); and Oystein Noreng, 'Brazil and Norway- Offshore Petroleum Experiences and Lessons' (2009) 35 Journal of Energy and Development 79.

²⁵² Cf. Fred von der Mehden and Al Troner, 'Petronas: a national oil company with an international vision' (The Changing Role of National Oil Companies in International Energy Markets, 2007); and Leslie Lopez, 'Petronas: reconciling tensions between company and state' in David G Victor, David R Hults and Mark C Thurber (eds), *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2012).

²⁵³ Baker Institute, 'Baker Institute Policy Report' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

²⁵⁴ Stacy L Eller, Peter R Hartley and Kenneth B Medlock, 'Empirical evidence on the operational efficiency of National Oil Companies' (2011) 40 Empirical Economics 623.

Petrobras, which are partially privatised, might have been considered revenue efficient and not necessarily biased towards short-term projects, as they argue.

Differently from Eller, Hartley and Medlock, Mark Thurber and David Hults posit that NOCs such as Petrobras and Statoil reveal a more risk prone attitude than others since they are less dependent on immediate short-term oil resources.²⁵⁵ Because of that, they can adopt long-term strategies, with goals that take increasingly into account industrial development targets and objectives of longer maturity to increase domestic technological standards, for example. They can also, for instance, spend more resources and time attempting to develop industrial infrastructure and local technical expertise that can increase the probability of future discoveries in the country.

That does not mean, of course, that Hartley and Medlock's conclusions are essentially wrong or misguided. Actually the fact that the two most efficient NOCs in their analysis, Statoil and Petrobras, are partially privatised and tend to operate more like IOCs than the other ones, in a certain way corroborates their main inference that IOCs are more revenue efficient than NOCs.

One possible problem affecting NOCs is that conflicting objectives can significantly impair the effective implementation of market strategies, which might, in turn, lead to stalemates. Another similar recurrent source of concern is the excessive use of non-commercial strategies and goals at the expense of the companies' production levels and long-term profitability.

The analysis of NOCs demonstrates that the greater the possibility of political interference in their daily operational and managerial activities, the higher the likelihood of privileging non-commercial goals over commercial ones.²⁵⁶ Firms such as NNPC (Nigeria) and PDVSA (Venezuela) have had their managerial activities intrinsically influenced by domestic

²⁵⁵ Cf. Mark Thurber and David R Hults, 'Management & Strategy-Risk Attitudes Shape National Oil Company Strategies' (2012) *World Oil* 97; and David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011).

²⁵⁶ Baker Institute, 'Baker Institute Policy Report' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

politics and have been facing, as a consequence, administrative hurdles. Other companies such as Statoil (Norway) and Petronas (Malaysia), have suffered less interference in their management routines.

In fact, in Norway, there has seldom been governmental interference in Statoil's commercial and daily operational activities for political purposes, while the company also avoids interfering in main state policy decisions.²⁵⁷ Two examples illustrate the degree of this corporate political insulation.²⁵⁸ The first was an occasion in which the Ministry of Petroleum blocked further developments in the gas field of Troll, claiming recovery harm of the deposits. Despite Statoil's dissatisfaction and opposition, it withdrew from the operations. In a second case, the government filed a suit against Statoil for the recovery of US\$ 2 billion that the company allegedly owed it.²⁵⁹ Had the relationships between the government and Statoil been closely politically linked, probably the NOC would have succeeded in reverting the governmental decision in its favour in both cases.

There has lately been a tendency among NOCs to incorporate elements of corporate efficiency and performance through some private company practices that include, for example, the creation of independent corporate boards of directors that aim to improve transparency, accountability and performance standards via increasing monitoring and oversight. Statoil, Aramco (Saudi Arabia's national oil company) and CNOOC (China National Offshore Oil Corporation), for example, have been using these corporate structures quite successfully.²⁶⁰ Even though the government generally nominates the boards, they can operate autonomously and independently when adequately designed. Other mechanisms such as IPOs, partial privatisations and commercial bonds improve accounting and financial practices, public

²⁵⁷ Cf. Richard Gordon and Thomas Stenvoll, 'Statoil: A study in political entrepreneurship' (The Changing Role of National Oil Companies in International Energy Markets, 2007); Mark Thurber and David R Hults, 'Management & Strategy-Risk Attitudes Shape National Oil Company Strategies' (2012) World Oil 97; and Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' (Program on Energy and Sustainable Development : Working Paper 92, 2010).

²⁵⁸ David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 599,655.

²⁵⁹ Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' (Program on Energy and Sustainable Development : Working Paper 92, 2010) 33.

²⁶⁰ Baker Institute, 'Baker Institute Policy Report' (The Changing Role of National Oil Companies in International Energy Markets, 2007)14.

reporting, transparency and corporate governance standards, often bringing international financial scrutiny to these firms in a positive way.

Partial privatisation, more specifically, also presents the advantage of relieving the state from further capital onus for investment purposes, while still maintaining national mission requirements. This gains increasing importance in periods of sharp price drops, when efficiency demands are particularly compelling.²⁶¹ Agency problems, however, tend to increase with partial privatisation of the company and even further with total privatisation, since the number of shareowners tends to increase. Petrobras particularly has been facing acute agency problems, which essentially arise from situations of conflict of interest of governmental board members.²⁶²

Norway, in turn, has a very austere approach towards conflict of interests in their SOEs and strictly forbids civil servants from being board members. This requirement had its origins in the mining accident of 1962 on the Island of Spitsbergen. On that occasion, the majority state-owned mining company was held responsible for the incident, when the petroleum minister was its chairman. Negligence, pointed out as one of the main reasons for the disaster, was associated with the conflict of interest situation resulting from having main appointees in the Board from ministries.²⁶³

Yet what the analysis of Norway and Brazil most importantly demonstrates is that state support through temporary protective policies, financial transfers and the creation of a NOC with operational capacity are important elements for the development of a solid oil industry.²⁶⁴ The existence of a well-established state enterprise with strong operational activities has been an important factor in these countries to guarantee that technological expertise will be locally developed, assimilated and transferred to domestic companies. The creation of NOCs intensively engaged in production activities has also been a differential element in assuring technology

²⁶¹ Valerie Marcel, *Oil titans* (Brookings Institute 2006) 46.

²⁶² See discussions below.

²⁶³ David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 612.

²⁶⁴ This idea will be further developed in the next sections.

assimilation and in curbing IOCs' excessive bargaining power in their relationships with local authorities.

NOCs can actually represent an effective way to gather more information about the country's oil reserves, guaranteeing more control over them and reducing, as a consequence, the information asymmetry between states and operating international companies.²⁶⁵ In regulated industries, one specific problem that can frequently occur is the existence of asymmetric information between regulator and regulated enterprises. While the latter has much more information about the market, the former is supposed to use this exact same information to control and monitor it. The challenge in these cases is how to ensure that the regulator can receive adequate data avoiding the problem of "capture".²⁶⁶ Another concern for regulatory agencies, especially in transition frameworks from a monopoly based system to a competitive one, is how to maintain competitive conditions of access to the market when the once monopolist has so much detailed information about the area and a natural advantage compared to competing firms.²⁶⁷

Sometimes the existence of a state-owned company is necessary for a thorough assimilation, understanding and effective monitoring of the available information on oil reserves. The logic of asymmetry reduction underpinned, for example, the creation of Statoil in Norway, which had a more effective control over private companies as one of its main goals. In Malaysia, similarly, one of the aims of creating its oil company was the concern that Shell did not disclose information on discoveries and production.²⁶⁸

²⁶⁵ Paul Stevens, 'National oil companies: good or bad?' National oil companies workshop: Current roles and future prospects <<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.197.8929&rep=rep1&type=pdf>> accessed 13 May 2014.

²⁶⁶ Daniela Couto Martins, *A Regulação da Indústria do Petróleo: segundo o modelo constitucional brasileiro* (Fórum 2013) 227.

²⁶⁷ Peter D Cameron, *Competition in energy markets: law and regulation in the European Union* (Oxford University Press 2002).

²⁶⁸ In some cases, instead of actually solving the alleged informational problem, another possible outcome is simply the shift of the focal point of the asymmetry from the IOC to the NOC. Victor, Hults and Thurber are quite emphatic about this possibility and claim that generally most state NOC relationships reveal this kind of informational discrepancy. Cf. David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 11.

In Indonesia the weak presence of its NOC, Pertamina, in upstream production activities, substantially impaired the development of the national oil industry in the country, which remained below adequate international performance standards.²⁶⁹ The Indonesian national oil company held from 1971 to 2001 regulatory functions and was the direct beneficiary of the cost oil in production-sharing agreements signed in the country.²⁷⁰ Pertamina revealed a tendency to gradually abandon exploration and production activities, concentrating instead on its contractual supervision functions, which brought significant and immediate revenues through production-sharing agreements.

In Norway, in contrast, the constant presence of Statoil through joint venture operations with IOCs acted as a catalyst for improved industrial performance and technological expertise transfer.²⁷¹ This strategy proved to be important once the domestic Norwegian oil fields attained maturity, since it gave the company an important advantage in increasing its international presence.

Expanding now on the analysis already provided on Statoil as a national oil company, the next section will analyse the Norwegian oil regulatory framework in more detail, aiming to extract useful lessons to Brazil.

4.2 THE CASE OF NORWAY

4.2.1 RECENT HISTORY

The first commercially viable oil discovery in Norway was Ekofisk, in 1969.²⁷² Norway was already well equipped to deal with regulatory oil issues when it took place. The country had then a trained and competent bureaucracy with expertise in natural resource regulations in

²⁶⁹ Donald Hertzmark, 'Pertamina: Indonesia's State-Owned Oil Company' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

²⁷⁰ See appendix for an analysis of the main characteristics of production sharing regimes.

²⁷¹ Cf. Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' in *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011); and Richard Gordon and Thomas Stenvoll, 'Statoil: A study in political entrepreneurship' (The Changing Role of National Oil Companies in International Energy Markets, 2007)

²⁷² Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' in *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 605.

areas like hydropower, fishing and mining. The adaptation of this technocratic expertise to the new demands of the petroleum sector was done in a well-planned and organised manner.²⁷³

Norway invested substantial resources and time in training civil servants in the institutional design of regulatory frameworks and in acquiring tailored expertise on the geological and geophysical features of their continental shelf. It was not until the discovery of Ekofisk, in 1969, that politicians showed interest in participating in discussions related to the oil sector.²⁷⁴ When that happened, however, the amount of expertise in the government was rather significant. One of the important consequences of this fact was that the subsequent governmental discussions were always conducted having the technical parameters as an essential starting point and were to a great extent technocratically led.²⁷⁵

The comparison of this situation with what occurred in Brazil in the years that followed the pre-salt discovery and the regulatory framework change in 2010 is particularly revealing. The discovery of Brazilian pre-salt layers was publicised and divulged with vigorous enthusiasm by the incumbent government. The immense reserves were claimed to be a “lottery ticket”, a “passport for a prosperous future”, in view of the significant propagated revenues that could be extracted from it. The almost irresponsible political use of the oil discoveries in Brazil is actually one of the main reasons behind the current royalties distribution stalemate in the country. All federal states now claim a fair share in the “passport for the future” provided by the so-called “lottery ticket”. Nurtured by the exaggerated view publicised by the government, politicians swiftly engaged in actions to increase their respective states’ shares.²⁷⁶ Such initiatives were only possible, however, because the government proposed a change in the regulatory framework before starting operations in the newly discovered areas. Had the former framework been maintained, each states’ percentage share would be already defined and any potential discussion for change would not have led to such a deadlock.

²⁷³ Ibid. 605.

²⁷⁴ Mark C Thurber and Benedicte Tangen Istad, ‘Norway’s evolving champion: Statoil and the politics of state enterprise’ (Program on Energy and Sustainable Development : Working Paper 92, 2010) 12.

²⁷⁵ Ibid. 12.

²⁷⁶ Interview with Joao de Lucca, President of the Brazilian Petroleum Institute (IBP) (Rio de Janeiro, 05 August 2013).

In contrast to the Norwegian case, in Brazil public discussions were scant, significantly politicised and lacked a strong technical foundation. Most worryingly, exaggerated state propaganda over oil yet to be extracted has led to a dangerous political deadlock over the distribution of royalties between state entities, which has not yet been resolved. Actually the Congress only approved the 2010 regulatory reform because the government excluded the provisions related to the distribution of royalties in the presented bill of law. This outcome largely resulted from the lack of a serious and well-elaborated technical discussion over the issue and the careless governmental management of expectations over the newly discovered resources.

Joao de Lucca in an interview with the author, noted that the insertion of the discussion over royalty distribution in the proposals for the new regulatory framework completely shifted the content of the debates from otherwise technical considerations about the impact on the country's long-term development to exclusively short-sighted political issues focused on the distribution of future revenues between federal entities.²⁷⁷ Within this setting, Michael Ross demonstrates that expectations can pose significant problems to populations of resource rich countries, leading to rooted dissatisfaction, whenever not adequately dealt with, even sometimes causing social and political unrest.²⁷⁸ John O. Kakonge similarly shows how important it is to adequately manage expectations in newly emerging oil and gas producer countries.²⁷⁹ He points out that in Ecuador, for example, unfulfilled expectations among Amazonian indigenous communities based in oil drilling locations has led to civil unrest which halted production.²⁸⁰ He also mentions Nigerian unmet expectations with the use of oil resources as one of the main reasons behind the entrenched mistrust between government, oil

²⁷⁷ Ibid.

²⁷⁸ Michael L Ross, 'How mineral-rich states can reduce inequality' in Macartan Humphreys, Jeffrey Sachs and Joseph E Stiglitz (eds), *Escaping the resource curse* (Cambridge University Press 2007) 245.

²⁷⁹ John O Kakonge, 'Challenges of managing expectations of newly emerging oil and gas producers of the south' (2011) 4 (2) *The Journal of World Energy Law & Business* 124.

²⁸⁰ Ibid. 126.

companies and local communities, which has led to a vicious cycle of violence and upheaval in the country.²⁸¹

Malaysia, on the other hand, stands as a successful case in dealing with social aspirations, mainly because of the strategic role played by its national oil company, Petronas, in forming good and reliable links among stakeholders.²⁸² When analysing these factors, Kakonge indicates that one of the most important elements to be avoided when dealing with oil policies is “fuelling distorted public expectations”.²⁸³ He particularly identifies politicians’ actions in overstating facts to gauge support as one of the most difficult perils to be overcome. That is exactly what happened in Brazil.

One essential dilemma faced by governments whenever dealing with expectations is to correctly assess to what extent public disclosure will lead to stricter accountability, due to increasing transparency and awareness, without unduly creating unsound aspirations. Probably the key to fine tune the exact posture between these sometimes divergent aspects is to disclose in a balanced manner all possible information, provided that it is reliable, understandable and non-confidential. One of the positive consequences of this initiative is that it feeds in credible information to public debates and policy discussions. Hence, the outcomes of the different political alternatives on the table will most likely be considered and conducted around more reliable and tangible results and scenarios. Actually, one of the key features of the ample public debates that followed the Ekofisk discovery in Norway over the regulatory framework was the essential role played by bureaucrats in clarifying facts and figures and in conducting the discussions around a set of objective, technical parameters.

In 1971 the government established the main policy guidelines for the oil sector in Norway. As a result of these guidelines, Statoil was created in 1972 a fully state-owned enterprise, mainly because the ruling Labour Party’s government was sceptical about the actual capability of a partially owned governmental entity to effectively take into account essential

²⁸¹ Ibid. 127.

²⁸² Ibid. 127.

²⁸³ Ibid. 129.

state public policies beyond market profitability and shareholder return.²⁸⁴The Norwegian government already had a percentage share in Norsk Hydro, an industrial conglomerate with operations in the oil sector, and one of its policy options was to exploit oil in its continental shelf through this company.²⁸⁵

The Norwegian Petroleum Directorate (NPD) was later formed as an agency responsible for regulation of the sector and with the important task of establishing policies to foster the development of a Norwegian petroleum industrial chain. One essential aspect of the Norwegian experience is that even though it created a fully state-owned company to operate in its Continental Shelf it maintained Norsk Hydro's operation in Norway as a partially state owned enterprise, and also an open and proactive stance towards joint venture operations with International Oil Companies (IOCs). This peculiarity of the Norwegian model promoted a healthy competitive environment, which forced operating companies to always seek improvements and higher efficiency standards.

Statoil actually performed two important functions after its creation. An active role in exploration and production of petroleum activities and also as the state's representative in financial rights and equity capital in joint venture operations with other enterprises. The company received an important initial state protection and preferential access to resources and capital for its early establishment. Statoil was allowed to have a 50% carried interest in newly discovered blocks that could accrue to 80%, according to a sliding scale.²⁸⁶

By the mid 1980s, the essential aspects of the Norwegian regulatory institutional design had already been established, with the separation of the policy formulation, regulatory and operational functions among different entities: the Ministry of Petroleum, NPD and Statoil, respectively. The parliament, which was also responsible for deciding about the areas to be open for exploration, supervised all these bodies.

²⁸⁴ Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' (Program on Energy and Sustainable Development : Working Paper 92, 2010) 19.

²⁸⁵ Richard Gordon and Thomas Stenvoll, 'Statoil: A study in political entrepreneurship' (The Changing Role of National Oil Companies in International Energy Markets, 2007) 21.

²⁸⁶ Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' (Program on Energy and Sustainable Development : Working Paper 92, 2010) 16.

In the 1980's a growing distrust of Statoil's excessive powers and privileges coincided with a shift in the political landscape from the previously Labour cabinet to a Conservative government. This group of politicians had previously advocated against the creation of Statoil and argued for the development of the Norwegian oil industry through the partially state-owned company Norsk Hydro.²⁸⁷ In an attempt to curb Statoil's disproportionate political influence, the company's interest in new oil fields was shifted to a newly formed accounting procedure, the State's Direct Financial Interest (SDFI), as previously described.

From that moment on, Statoil increased even further its international operations, which steadily grew thereafter. In 2001 the company was partially privatised and in 2006 it merged with Norsk Hydro. The main goal of the merger was to create significant economies of scope and scale to be able to compete more effectively abroad.²⁸⁸

4.2.2 CURRENT INSTITUTIONAL AND LEGAL DESIGN

The Parliament (Storting), the Ministry of Petroleum and Energy (MPE), the Norwegian Petroleum Directorate (NPD) and the State's Direct Financial Interest (SDFI) currently compose Norway's oil sector, together with two state-owned enterprises that operate in the country - Petoro and Statoil, the international oil companies and other companies that supply services for oil activities.

The Parliament (Storting) is responsible for the proposal and approval of the legal regulatory framework in Norway. It monitors and exerts oversight over the public administration, the government and discusses projects of significant impact and issues of substantial public interest.²⁸⁹

²⁸⁷ Richard Gordon and Thomas Stenvoll, 'Statoil: A study in political entrepreneurship' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

²⁸⁸ Cf. Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' in *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011); and Richard Gordon and Thomas Stenvoll, 'Statoil: A study in political entrepreneurship' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

²⁸⁹ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 224.

The Ministry of Petroleum and Energy (MPE) is the main entity responsible for the management of oil resources in Norway and follows the Parliament and the government's guidelines. It also has the role of monitoring and exerting control and owner responsibility over the state-owned enterprises, Petoro, and the partially owned Statoil.

The Norwegian Petroleum Directorate (NPD) is a typical regulatory agency, subordinated to the MPE. Its main function is to exert managerial and financial control over exploration and production of oil. It is also part of MPE's consultative body.

The State's Direct Financial Interest (SDFI) is an accounting mechanism created in the Norwegian national budget, which assigns a percentage right over oil licenses to the state. It is separated from the Norwegian Budget and is similar to a virtual fund. The state uses the SDFI to assert its right over strategic licensed oil projects and also to undertake the necessary investments, cost disbursements and profit shares. The net cash flow of SDFI's portfolio is automatically transferred to a government pension fund, which previously used to be the Petroleum Fund.²⁹⁰

Petoro is the fully state-owned company responsible for the management of SDFI. It does not hold any interest or participation in the fund. The company's activities are restricted to Norway and it is strictly forbidden to undertake operational tasks related to oil exploration and production.

Finally, Statoil is a partially state-owned company with a vertical structure of activities from upstream to downstream. As already explained, Statoil currently holds significant international operations and a mix of private and public equity. Because of its structure, it attempts to maintain high levels of corporate efficiency, while also contributing to some essential state goals, such as significantly adding value to the Norwegian petroleum industry.²⁹¹

²⁹⁰ Ibid. 225.

²⁹¹ Cf. Richard Gordon and Thomas Stenvoll, 'Statoil: A study in political entrepreneurship' (The Changing Role of National Oil Companies in International Energy Markets, 2007); and Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' in *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011).

Despite maintaining a rather arm's length relation with the state, if compared to most of the oil producer countries' NOCs, especially those in the Middle East, Statoil's power and influence within the government has varied quite significantly. From the time of its creation until the mid-1980's, Statoil constantly struggled for further affirmation and state presence, while the MPE and the NPD, had the constant preoccupation of curbing its power with the fear that it became a "state within a state".²⁹²

The company's power and privileges kept increasing until 1985. Until that moment, Statoil successfully expanded its percentage interests in newly discovered blocks under the lead of the CEO Arve Johnsen, a member of the Labour party who emphatically lobbied to extend the enterprise's privileges.²⁹³ In 1985 the creation of the SDFI abrogated some of Statoil's privileges. This coincided with the beginning of the company's more intensive move towards other countries, the development of a more performance-oriented commercial culture and the maturity phase of the Norwegian oil reserves.

The geological conditions of the Norwegian oil fields actually impelled Statoil to move abroad to continue expanding its reserves. The previous joint-venture activities of the company with major IOCs and the former international presence acted as important catalysts in this strategy. This move, together with the partial privatisation of the company in the late 90's, induced it to adopt an increasing commercially-driven culture with stricter managerial control and financial discipline. It also enabled Statoil to more effectively use diverse investment options such as capital equity and mergers and acquisitions.²⁹⁴

The MPE, in its turn, actually performed a quite difficult task in striking a balance between a supportive policy aimed at stimulating Statoil to develop a strong Norwegian oil industry, while also trimming its powers whenever necessary, so it did not become too

²⁹² Paul Stevens, 'National oil companies: good or bad?' National oil companies workshop: Current roles and future prospects
<<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.197.8929&rep=rep1&type=pdf>> accessed 13 May 2014 10.

²⁹³ Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' in *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011)618,620.

²⁹⁴ Ibid.623.

prevailing and non-accountable. One episode that illustrates the resolve in curbing Statoil's excessive powers was the removal of Chairman Hauge, considered to be "meddling inappropriately in the political realm".²⁹⁵ Even though this chairman had been a war hero and held a high reputation in Norwegian politics, he was required to resign by the Ministry, which changed Statoil's whole board to give it a more diverse political composition.

Therefore, the Norwegian regulatory framework is based on a model of clear separation of functions between different entities with the main goal of fostering the appropriate level of checks and balances among them. The Parliament sets the main political direction of the petroleum policy through legal norms and defines the exploration areas. The MPE, the main body of the executive branch, is responsible for governmental policymaking within this branch, which should be set in accordance with the guidelines and parameters legally defined. The NPD regulates the sector, attempting to maintain its independence and to perform its activities avoiding political and corporate interference. Statoil holds operational oil activity functions and Petoro manages the state's financial interests and the cash flow of its portfolio. While NPD, Petoro and Statoil are subordinated to the MPE, which exerts oversight over their activities and makes sure they are performed in accordance to its policymaking, the Parliament controls and monitors all these bodies.

The Norwegian model was initially envisioned as having an independent board to oversee NPD, ensuring its autonomy from politics and any influence that could have arisen from its subordination to MPE.²⁹⁶ Yet such idea was later abandoned and considered unnecessary since in practice NPD was deemed to actually exert its functions with significant autonomy. One of the main reasons for this genuine independence in spite of the formal subordination was the Ministry's technical dependence on NPD and the widespread view that any initiative to undermine independence would essentially destabilise both institutions in the long run.²⁹⁷

²⁹⁵ Ibid. 619.

²⁹⁶ Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' (Program on Energy and Sustainable Development : Working Paper 92, 2010) 28.

²⁹⁷ Ibid. 28.

Actually the NPD in its early years faced significant problems to establish itself as a reliable and technically robust institution in Norway. One of the main difficulties it encountered was to acquire relevant technical information from Statoil and from MPE. Another one was to form a group with the required technical expertise to effectively perform the agency's functions. A critical factor for NPD to develop its own specific capabilities, which is one of the most important elements of its actual independence, was the significant state investment in the agency in its early years. The existence of higher and separate salaries from the MPE was fundamental in this sense. After some years, moreover, NPD's existence counted with progressive acceptance within MPE, since it allowed the Ministry to focus more on policy design.

Two basic normative principles guide the legal framework of the Norwegian oil policy: i) the acknowledgement that oil and gas resources belong to society as a whole and should therefore be adequately managed and explored in a sustainable way, to the benefit of current and future generations; and ii) the guarantee that aggregated value in the activities of oil production and exploration will essentially accrue to the Norwegian society.²⁹⁸

Norway has a concession regime with state participation.²⁹⁹ The main Law regulating petroleum activities in the country is the Petroleum Act. This statute grants to the state exclusive rights over oil resources *in situ* in the Norwegian Continental Shelf.

Two types of licences exist, exploration licences and production licences. The latter is normally established for a period of three years and does not imply any kind of preference in the establishment of the former. The production phase grants exclusive rights in a certain area and also in the property of the extracted oil. One difference in the Norwegian production bidding rounds, compared to Brazil, is that the choice of the winner is established according to a discretionary process of selection of the technically best project.

Another contrast is that in Brazil concession contracts comprise both the exploration and the production phases. In case of successful accomplishment of the exploration stage the

²⁹⁸ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 226, 227.

²⁹⁹ See Appendix for an analysis of the different types of oil regimes around the world.

company submits to ANP a detailed project for the production phase for its approval. The Brazilian model in this particular aspect has the advantage of reducing transaction costs of the whole process, if compared to Norway, where a new bidding round has to take place at each stage. Another drawback of the Norwegian model is the risk that the concessionaire's efforts in gathering all the information in the first stage is not adequately compensated by guaranteeing it will be selected in the next phase. The risk is that other companies not in the first stage might have access to the information collected by the concessionaire of the exploration phase, free-riding, as a consequence, on its efforts. Concessionaires of the first stage have a natural advantage, however, in the bidding rounds for the next one, since they will normally have much more information about the area, some of which they might be able to keep secret, and will hence submit a more technically sound project.

A period of negotiation after the submission of the proposal for the production phase is another Norwegian peculiarity. This possibility is interesting and might lead to a better tailoring of the project to the country's need, to an increase in government take or even to the elucidation of some specific technical aspects that might lead to potential future disputes. In Brazil this possibility of negotiation does not exist, since bids are presented in secret envelopes and decisions are made in one exclusive round after assessment of the proposals.

This Brazilian feature reinforces the "winner's curse" phenomenon. This phenomenon takes place whenever one specific bidder holds more information about the auctioned region than all others, as happens with Petrobras in Brazil.³⁰⁰ In these instances, according to the winner's curse theory, other bidders tend to reduce their bids in an attempt to avoid losses resultant from higher offers than the real value of the oil region under dispute. The existence of successive rounds or of a negotiation process, as in Norway, could reduce the winner's curse occurrence in Brazil, since it would allow bidders to adapt their bid offers and strategies

³⁰⁰ César Mattos, 'Licitações da ANP, PETROBRAS e a "Maldição do Vencedor"' (2008) MARCOS REGULATÓRIOS NO BRASIL 65.

accordingly, after having had access to the bid presented by the company which holds more information about the auctioned area.³⁰¹

The control mechanism available to state entities in all ventures that count with participation of the SDFI might also offer guidance to Brazil in the governance structure of operational committees. In Norway, Petoro has the possibility of vetoing any decision of the Operational Committee in which SDFI has an interest and that is not in accordance with the financial interests of the Norwegian state. This veto power has never been used in Norway but its existence is a manner of guaranteeing that the state's interests can be reassured if needed.

It is, however, in the area of local content policies that the Norwegian experience is particularly valuable to Brazil. Such policies have been considered extremely successful in Norway, since the country nowadays counts with a robust and technologically advanced oil industry.³⁰² MPE estimated as two-thirds the share of local content in the Norwegian oil sector in 2010.³⁰³

The first aspect indicated as one of the reasons for high achievements are the partnerships between local and foreign corporations encouraged by authorities.³⁰⁴ A second point is the use of local purchases as one of the criteria considered in the selection of public auction winners. Hence, differently from the Brazilian current model in pre-salt and strategic areas, in Norway authorities did not require mandatory purchase levels and did not directly interfere in companies' purchasing policies. Yet they maintained strict control and transparency of all the sales and contracting activities, publicising them to all interested parties, which encouraged accountability and oversight. When the country entered the European Economic Area (EEA), in 1994, and had to abandon their procurement policy, the Norwegian oil industry

³⁰¹ Ibid.

³⁰² Cf. Oystein Noreng, 'Brazil and Norway- Offshore Petroleum Experiences and Lessons' (2009) 35 *Journal of Energy and Development* 79; Sachi Hatakenaka and others, 'The regional dynamics of innovation: A comparative study of oil and gas industry development in Stavanger and Aberdeen' (2010) 3 *International Journal of Innovation and Regional Development* 305; and Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' (Program on Energy and Sustainable Development : Working Paper 92, 2010).

³⁰³ Oystein Noreng, 'Brazil and Norway- Offshore Petroleum Experiences and Lessons' (2009) 35 *Journal of Energy and Development* 79, 92.

³⁰⁴ Ibid. 93.

was totally prepared for the new competition conditions. The existence of such a deadline for the procurement policy actually forced local suppliers to prepare in advance for the new circumstances and signalled beforehand that it would be provisional.

Finally, Norway's regulatory framework has some very important provisions to foster research and development. The "Training Agreement", for example, allows the government to indicate a certain number of its employees to participate, free of cost, in the training programmes of the concessionaire companies.³⁰⁵ The "Frame Agreement on Technological Research and Development" stipulates that 50% of the total expenditure with R&D in projects related to the concession contract ought to be spent in Norway in cooperation with Norwegian suppliers and service companies. These companies should also be guaranteed the right to use the offshore installations to conduct their research projects. Hatakenaka shows how these provisions have been an important element to foster an adequate environment for the development of a competitive and productive oil industry with a high degree of technological standard.³⁰⁶

4.3 CONCLUSION

Brazil can extract very useful lessons from the international experience in oil sector regulation. First, it should take into account that in spite of NOCs' growing importance, this does not mean that international oil companies are no longer relevant and cannot exert significant roles in national oil policies. Countries such as Venezuela, Bolivia, Argentina and Brazil have recently engaged in resource nationalist actions³⁰⁷ that risk relinquishing this important

³⁰⁵ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 233.

³⁰⁶ Sachi Hatakenaka and others, 'The regional dynamics of innovation: A comparative study of oil and gas industry development in Stavanger and Aberdeen' (2010) 3 *International Journal of Innovation and Regional Development* 305.

³⁰⁷ On the 1 May 2006, the Bolivian government took control of all the oil and gas production chain and demanded all foreign companies to renegotiate their contracts with the Bolivian National Oil Company YPFB. Cf. Marilda Rosado de Sá Ribeiro, 'Sovereignty over Natural Resources Investment Law and Expropriation: The case of Bolivia and Brazil☆' (2009) 2 *Journal of world energy law and business* 129. Argentina, similarly nationalised on 17 April 2012 its oil company YPF that had been sold to the Spanish oil company Repsol. Cf. Valor Economico, 'Argentina aprofunda o intervencionismo estatal' (2012) *Valor Economico*.

contribution of IOCs, through joint venture operations.³⁰⁸ As here demonstrated these can be an invaluable source of technological assimilation and transfer, as well as a means of reducing overwhelming investment risks and burdens. Normally the most successful regulatory experiences around the world rely on joint cooperation between NOCs and IOCs, which are often considered complementary.³⁰⁹

Another risk related to national oil companies' strategies is to concentrate excessively on non-commercial goals, relegating efficiency targets and competition parameters to a minor role. Case studies of successful NOCs reveal that these elements are essential for developing a solid oil industry. Corporate and regulatory adaptability, on the other hand, are also important factors to take into account according to the international experience.

Secondly, the analysis of the Norwegian regulatory framework demonstrated that Brazil has more similarities than differences when compared to this country. Both nations have different agencies responsible for the regulatory, policymaking and operational functions, with a system of checks and balances between them. Brazil and Norway have technologically advanced partially state-owned oil companies, which are responsible for most of the production in their countries, but also have an important international presence, especially in offshore exploration.

Both countries have implemented state policies with the goal of increasing the technological standards of the local industry and its added value to the economy. A concession regime with state presence and ownership *in situ* of oil is another common aspect. Brazil and Norway have also shown promising results in oil exploration and production. Most specialists consider that a great part of this success can be attributed to a stable and predictable regulatory

³⁰⁸ Cf. Munir Maniruzzaman, 'The Issue of Resource Nationalism: Risk Engineering and Dispute Management in the Oil and Gas Industry' (2009) 5 Texas Journal of Oil, Gas & Energy Law 79; Knowledge@wharton, 'Will Resource Nationalism Spoil Brazil's Big Oil Future?' Knowledge@wharton Public Policy <<https://knowledge.wharton.upenn.edu/article/will-resource-nationalism-spoil-brazils-big-oil-future/#>> accessed 20 March 2013; and Marilda Rosado de Sá Ribeiro, 'Sovereignty over Natural Resources Investment Law and Expropriation: The case of Bolivia and Brazil ☆' (2009) 2 Journal of world energy law and business 129.

³⁰⁹ Baker Institute, 'Baker Institute Policy Report' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

framework that fostered competition among firms, while also allowing companies to form consortia and joint ventures for the bidding rounds and operational activities. Specific public policies targeted at their National Oil Companies for their initial developments and improvement of technological capabilities is another common trait.

Yet most useful lessons come from the differences, not the similarities. Probably the utmost advantage of the Norwegian regulatory framework compared to Brazil is its underpinning on well elaborated guidelines,³¹⁰ which were extensively discussed and debated in a very rational, democratic, transparent and participatory manner. These guidelines set the essential principles for the Norwegian oil policy, which have remained rather unchanged in its essential foundations. Around this core set of guiding principles, however, specific regulations have been enacted to allow for an adequate adaptation of the risk-compensation ratio throughout time and for the necessary adjustments to the different circumstances.

Another essential difference between Norway and Brazil is the amount of discussion, debate and transparency that has always prevailed around the definition of the core elements of the Norwegian regulatory framework. It is quite impressive that the country has successfully accomplished such a degree of openness and transparency at the very same moment when the discoveries in the North Sea were taking place. This is a proof of public responsibility and competence in dealing with social expectations. To a great extent this success can be credited to the technical conduct of the debates by a well-prepared bureaucracy.

Another important difference between both countries is the constant Norwegian concern in not allowing its National Oil Company to become too powerful, non-accountable and meddled with political matters. Such preoccupation is often neglected in Brazil and sometimes Petrobras is excessively involved in political issues that go beyond its core goals as a NOC.

Finally, despite the several similarities between both oil regimes, the 2010 regulatory modifications in the Brazilian oil regulations have made both models become increasingly

³¹⁰ Cf. Section 4.2.1.

divergent. Unfortunately, that is not a good sign for the Brazilian oil sector, as the next chapters will demonstrate.

PART II – REGULATORY GOVERNANCE IN BRAZIL AND ITS EFFECTS

This part II of the thesis analyses how the Brazilian regulatory framework affects important oil policy variables. The purpose here is to provide a prescriptive analysis of the effects on the following parameters: i) investments; ii) production; iii) technology and innovation; and iv) strategic control of oil. These variables are fundamental for any country's energy policy and Brazilian laws mention them as necessary pre-requisites for the development of the sector.³¹¹

Investments are considered according to the classical economic terminology as the sum of inventories' variation with gross fixed capital formation directed to the oil industry. This indicator mainly assesses the funds directed for increasing the production capacity of a particular business. Technology and innovation are understood in this chapter in their broadest sense as the amount of specialised scientific knowledge and expertise, which usually accrue to future increases of production levels. The focus essentially takes into account how the new regulations, practices and standards provide adequate incentives and appropriate governance mechanisms to foster technology and innovation in the Brazilian oil sector and what are the potential limitations and hindrances to this process.

The same approach is applied to the assessment of production. The analysis of the variables therefore goes beyond a mere forecast of production levels, analysing, instead, what are the institutional mechanisms and factors that affect these parameters, what are the dynamics that foster or thwart them. The analysis of the strategic control of oil considers the government officials' understanding of the term when proposing the 2010 reforms:³¹²the possibility of greater influence over the production process and the increasing wealth

³¹¹ Article 1, III, X and XI of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997).

³¹² According to the Interministerial Exposition of Motives N. 38 – MME/MF/MDIC/MP/CCIVIL, 31 of August 2009. Available at <http://www.planalto.gov.br/ccivil_03/projetos/expmotiv/emi/2009/38%20-%20mme%20mf%20mdic%20mp%20ccivil.htm> accessed 13 October 2013.

appropriation coming from the exploration of oil activities. The goal is to examine whether or not regulations contribute to these goals.

As mentioned in previous chapters, the study primarily uses new institutional economic theory as its theoretical framework. This approach has the main advantage of considering rules and norms not as an end in themselves, with closed and self-contained meanings. It envisages them, instead, as one of the several institutions that establish basic rules and procedures for the relationships between and within corporations and organisations. This wider interplay, in turn, affects the variables being considered here. Another main advantage of this approach is its dynamic and evolving nature, since it takes into account institutions' history, culture and specific context, assessing how they affect and are affected by these elements.

According to North, the main role of institutions is organising social relations and reducing uncertainties derived from them.³¹³ In doing so, they provide social agents with a structure of incentives that influence industrial and economic performance. In the case of the oil sector in Brazil, for example, the legal framework establishes basic parameters for the relationships and interactions between main corporations and institutions operating in the sector: the National Regulatory Agency (ANP), Petrobras, international oil companies, the Ministry of Mines and Energy (MME), the National Council of Energy Policy (CNPE) and the Presidency of the Republic.

These legally defined parameters, however, are also influenced by informal rules and procedures that come into play not only in the relationships between these entities, but also within them. Hancher and Moran state that "... the allocation of power and influence within regulatory space is influenced both by legal tradition and by a wide range of social, economic and cultural factors that go beyond narrow 'rules of the game.'"³¹⁴ The objective here is, therefore, to analyse how all these aspects interact and how they can affect and explain the outcomes in the Brazilian oil sector. The following chapters do not intend to test, examine or

³¹³Douglass C North, 'Economic performance through time' (1994) *The American economic review* 359.

³¹⁴ Leigh Hancher and Michael Moran, 'Organizing regulatory space' in Leigh Hancher and Michael Moran (eds), *Capitalism, Culture and Economic Regulation* (Oxford University Press 1989) 292.

clarify any particular theoretical aspect of the new institutional economics theoretical framework by analysing the Brazilian oil industry. Rather, the purpose is to use the theoretical framework to explain and understand the changes in the Brazilian oil sector and their possible implications.

The responsive and reflexive theories will also be frequently used in the analysis of this part II of the thesis. Such conceptual frameworks are useful to demonstrate how the excessively intrusive Brazilian regulations create setbacks that could have been avoided with a more cooperative and flexible regulatory model.

The following sections will consider each of the variables, in turn. As discussed in the introduction, the effects on the variables will be mainly considered with respect to the upstream oil sector, which is the segment mostly affected by the 2010 reform.³¹⁵

³¹⁵ The upstream sector comprises all the activities of exploration and production.

Oil can be considered the most important strategic resource of the modern world.³¹⁶ Its abundance or scarcity has conditioned economic performance, state interventions and geopolitical power since the 20th century.

Strategic control will be here understood as the actual capacity to influence the production process and the appropriation of its financial proceeds according to the different specific governmental necessities and requirements. These requirements, as will be further discussed, can have the most diverse justifications and serve the best social intentions, such as sharing of proceeds among different social and intergenerational groups via the Social Fund, for example. This is a discussion, however, related to the use of the strategic control of oil for certain purposes, which will be conducted subsequently, since it presupposes the actual existence of this increasing command in the first place.

The study conducted here will demonstrate that the current regulatory framework will only achieve its aim of increasing strategic control over oil in some very particular circumstances, while also causing substantial shortcomings in the three other studied variables, as demonstrated in the next chapters.

The chapter is subdivided into three main sections. The first two take into account the dual central motives given by the incumbent government for changing the regulatory framework in 2010: i) the need to improve the state's control of oil production; and ii) the urge for a greater appropriation of the potential wealth.³¹⁷ These objectives have been broadly categorised as “strategic control of oil”. The first section analyses how the state can exert control over the production process, whether the regulatory framework enables this increasing command and what are the possible implications. The second one examines if the current regulatory framework contributes to a greater appropriation of wealth coming from the

³¹⁶Fernando Pimentel, *O fim da era do petróleo ea mudança do paradigma energético mundial: perspectivas e desafios para a atuação diplomática brasileira* (Fundação Alexandre de Gusmão 2011) 31.

³¹⁷ According to the Interministerial Exposition of Motives N. 38 – MME/MF/MDIC/MP/CCIVIL, 31 of August 2009. Available at <http://www.planalto.gov.br/ccivil_03/projetos/expmotiv/emi/2009/38%20-%20mme%20mf%20mdic%20mp%20ccivil.htm> accessed 13 October 2013.

exploration of oil activities. After these considerations, the final section analyses what the strategic control of oil can be used for and whether or not the different options are desirable in the case of Brazil.

5.1 GREATER CONTROL OVER THE PRODUCTION PROCESS

One of the reasons the government presented to change the oil regulatory framework was the need to assert greater control over the production process.³¹⁸ The immediate question that arises then is what the expression exactly means. There are several possibilities. This control could be exerted over: i) the reserves; ii) the exploration and extraction process; iii) the refining of crude; or iv) the commercialisation of oil.

The following sections will consider each of these distinct options and examine to what extent the current regulatory framework contributes to their achievement.

5.1.1 CONTROL OVER THE RESERVES

The property over onshore oil reserves in Brazil is a constitutional right established in article 176 of the Federal Constitution. According to its provisions:

“Mineral deposits, under exploitation or not, and other mineral resources and the hydraulic energy potentials form, for the purpose of exploitation or use, a property separate from that of the soil and belong to the Union, the concessionaire being guaranteed the ownership of the mined product. (CA No. 6, 1995)”³¹⁹

Therefore, the provision explicitly prescribes that property of mineral resources belong to the Union, which is a legal entity of public Law vested with the Brazilian state’s

³¹⁸ According to the Interministerial Exposition of Motives N. 38 – MME/MF/MDIC/MP/CCIVIL, 31 of August 2009. Available at <http://www.planalto.gov.br/ccivil_03/projetos/expmotiv/emi/2009/38%20-%20mme%20mf%20mdic%20mp%20ccivil.htm> accessed 13 October 2013.

³¹⁹ Constitution of the Federative Republic of Brazil (Constituição da República Federativa do Brasil).

sovereignty.³²⁰ Since oil is considered a mineral resource, the Union owns its *in-situ* onshore property.

National sovereignty over mineral underground resources is a common worldwide feature. The United States is one of the few exceptions to deeming as governmental property subsoil oil reservoirs, which, in that country, are assigned to public or private landowners of the surface.³²¹ As demonstrated in chapter 2, oil played a significant role in this process of assigning state sovereignty over mineral resources.

Ownership of offshore reserves, on the other hand, is regulated in Brazil by article 20 of the Federal Constitution. This provision is extremely important for the country since 90% of its oil reserves are currently located in deep waters off the coast.³²² The article sets out:

Article 20. The following are property of the Union: (CA No. 46, 2005):

(...)

V – the natural resources of the continental shelf and of the exclusive economic zone;

VI – the territorial sea;

VII – tide lands and those added to them;

(...)

IX – the mineral resources, including those of the subsoil;³²³

Therefore, offshore resource ownership comprising the territorial sea, the continental shelf and the exclusive economic zone also pertain to the Union³²⁴ according to the Federal

³²⁰ Alexandre De Moraes, *Direito constitucional* (Editora Atlas 2002) 269.

³²¹ Cf. Nadine Bret Rouzaut and Jean Pierre Favennec, *Petróleo & Gás Natural: Como Produzir e a que Custo* (Synergia 2011) 59; Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 120; and Marilda Rosado de Sá Ribeiro, *Direito do petróleo: as joint ventures na indústria do petróleo* (Renovar 2003).

³²² International Energy Agency (IEA), 'World Energy Outlook 2013' (2013) 315.

³²³ Article 20 of the Constitution of the Federative Republic of Brazil (Constituição da República Federativa do Brasil) Federal Constitution of Brazil.

³²⁴ The Union is a legal entity of public Law vested with the Brazilian state's sovereignty. Cf. Alexandre De Moraes, *Direito constitucional* (Editora Atlas 2002) 269.

Constitution. The inevitable conclusion is that the Brazilian constitution already provided control over onshore and offshore oil reservoirs since its enactment in 1988. Hence, it wouldn't be necessary to reform the existing oil regulatory framework before 2010 to exert greater control over oil reserves in Brazil.

5.1.2 CONTROL OVER THE EXPLORATION AND EXTRACTION PROCESS

Control over the exploration and extraction process can take place in four ways. First, via the organisation of bidding rounds, often labelled as “bidding policy”. Not all countries organise public auctions for oil exploration. Brazil, Argentina, Australia and Canada are some of the nations that use public auctions to determine the companies that will explore their oil.³²⁵ The advantage of having open public tenders for this purpose is that they emulate competition among potential contenders, ideally conferring exploration rights to the company that best meets the selection criteria. These can be the payment of royalties, for example, the use of local equipment, or even a combination of several parameters. The selection is supposed to take place in a transparent, objective and equitable way. Since the property of oil reservoirs in Brazil is vested in the state, it is also responsible for the bidding policy. The entity in charge of the bidding policy in Brazil is the Presidency of the Republic, which acts upon recommendations of the National Council of Energy Policy (CNPE).³²⁶

The second manner of exerting control over exploration and extraction is through the direct presence of a national oil company (NOC). Most oil producing countries have a state enterprise in the sector. There is, however, a significant worldwide variance in the functions performed by these companies. In some countries such as Brazil and Norway, these enterprises compete on an equal basis with other private companies in public tenders for oil exploration rights. Whenever they are successful, they perform all operational activities for the extraction and production of oil. In others, such as Mexico (until 2013),³²⁷ Venezuela and Iran, they are

³²⁵ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 45.

³²⁶ Article, 9, I of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

³²⁷ The Mexican oil sector has been reformed on December 2013 and it now allows PEMEX, the Mexican national oil company to compete with other oil companies.

essentially responsible for contracting other corporations, which provide exploration services for them. Finally, in some nations NOCs sign joint venture agreements with other firms, which generally are selected in bidding rounds. This is the case in Venezuela and Angola.³²⁸

The third way of having exploration and extraction command over petroleum is through the presence of a state representative entity that does not hold operational activities as an oil company, but monitors, oversees and manages these tasks, which are under the responsibility of other corporations. That is the case of PPSA, in Brazil, or Petoro, in Norway, which are both entirely state-owned enterprises. These entities can exert their deliberation powers in different manners.³²⁹

Finally, state control over crude supply can take place via the approval of the development and working plans, as well as through the declaration of commerciality. This role is normally assigned to regulatory entities. In Brazil ANP holds these responsibilities. The next sections will now analyse these four ways of exerting control over the exploration and extraction process in light of the current Brazilian regulatory framework.

BIDDING POLICY

The President of the Republic is responsible for approving energy policies in Brazil after examining CNPE's proposals. Since the auction of oil blocks is part of the energy policy, the President is the ultimate authority in this respect. She is responsible for approving the areas to be offered in public tenders after CNPE's recommendation. Before the enactment of Law 12,351, ANP was responsible for defining the blocks submitted to public auction.³³⁰

Another noticeable modification in bidding policies, which was put in place after the discovery of pre-salt layers in Brazil, was the interruption of annual bidding rounds, which had been taking place until then since 1999. This frequency had offered predictability to potential participants and represented a safety net for those considering investing in Brazil, because they

³²⁸ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 35.

³²⁹ This topic will be further discussed below.

³³⁰ Maria D'Assunção Costa Menezello, *Comentários à Lei do petróleo: Lei federal no. 9,478, de 6-8-1997* (Editora Atlas 2009)185.

knew that further opportunities to operate in the country would be available. The regularity signalled to them upfront that further prospects for increasing their reserves in the country would be accessible in case they decided to enter the Brazilian market. They could, in that instance, use the already available infrastructure in existing projects to carry on further ventures.

There has been an increasing demand in the Brazilian oil industry for the reestablishment of a timetable of public auctions in Brazil. The Brazilian Petroleum Institute (IBP) has formally presented this request.³³¹ The government has disregarded it, however. Its main concern seems to be the incapacity of the local Brazilian industry of suppliers to cope with additional projects. The current Secretary of the Ministry of Mines of Energy, Marco Antonio Almeida, mentioned that “he could not plan a bidding round considering areas that are not interesting and which could overburden the industry of suppliers”.³³² This explanation indicates that the government seems to prioritise the development of a vigorous industry of suppliers for the upstream segment rather than increasing production levels.³³³ Some scholars contend that the long interruption of bidding rounds from 2008 to 2013 results from the government’s view that the local industry of upstream suppliers should be given the necessary time to cope with the consequent demand escalation for its products and services that will follow from local content policies in the pre-salt area.³³⁴

Another possible explanation for not accepting the industry’s call for a timetable of public auctions is the need to perform the necessary studies as to the potential of the offered areas. This was the reason given by ANP’s director general, Magda Cambriard in the event held

³³¹ André Ramalho e Rodrigo Polito, ‘Oposição ‘acolhe’ propostas do setor do petróleo’ *Valor Econômico* (Rio de Janeiro) <<http://www.valor.com.br/brasil/3719328/oposicao-acolhe-propostas-do-setor-do-petroleo#ixzz3EzzPwef8>> accessed 13 October 2014.

³³² Rodrigo Polito and André Ramalho, ‘Governo evita definir data de leilões’ *Valor Econômico* (Rio de Janeiro, 18 September 2014) <<http://www.valor.com.br/empresas/3700704/governo-evita-definir-data-de-leiloes#ixzz3Dft9Scjc>> accessed 13 October 2014.

³³³ This topic will be further developed in chapter 7.

³³⁴ Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013).

in London on 13 November 2013 “Brazil – UK Oil and Gas Meeting”, when asked by the author about this topic.³³⁵

The decision regarding the areas to be offered in public auctions and the frequency of tenders, defined as the bidding policy, are the most important elements of state control over the production process since they will define all other aspects and parameters related to production. To put it simply, without auctioned blocks no production is possible. Based on the government’s estimates on the probability of discovering oil on a commercial basis, it will conduct public tenders in a certain area. It will set the government take and the basic conditions for exploration and production in tender protocols and the draft contract part of them, to be signed between the selected companies and the government. These documents distinguish two stages: the exploration phase, when oil has not yet been discovered or appropriately tested for commercial exploitation, and the production phase, which is launched with the declaration of commerciality.

The monitoring and oversight of these two stages is performed by ANP in Brazil, which approves the development and working plans and also the declaration of commerciality of exploration blocks, which technically separates the exploration from the production phase. Therefore, the agency holds considerable authority in controlling these two stages and also the evolution from one to the other. Even though this competence is not technically exerted at the moment of public auctions, draft protocols of bidding rounds mention the essential parameters and criteria of the forthcoming development and working plans, in accordance with article 29, XIII of Law 12,351.

Taken altogether, the main modification put in place by the 2010 reforms with respect to bidding policies was to revamp CNPE’s functions in the delimitation of the offered areas, centring the decision on the President of the Republic. These modifications are laudable, since the definition of auctioned areas is an essential aspect of policy formulation, which should not

³³⁵ Organised by the Commercial Section of the Embassy of Brazil in the United Kingdom, the fourth Brazil-UK Oil & Gas Meeting took place at the Sofitel London St James on Thursday 13 November 2014. Available at: <http://www.brazil.org.uk/commercial/4th-oil-and-gas-meeting.html> accessed 24 November 2014.

be in the hands of a regulatory agency, as it used to be before 2010. Yet although ANP was responsible for the definition of the auctioned areas before 2010 that does not necessarily mean that the government's participation in the process was less intense previously. As already demonstrated in chapter 2, the agency suffered much more influence from the Executive branch before 2010. ANP's less interfering stance on the delimitation of blocks for public tenders thereafter coincides with the general tendency of President Lula's mandate of shifting of powers from regulatory agencies to entities directly linked to the President such as MME and CNPE, and to an intensification of this process in the oil sector after 2010.³³⁶ Therefore, the government has always had control over the bidding process, since the 2010 reform simply shifted competences from one state entity to another.

NATIONAL OIL COMPANIES (NOCS)

The existence of a national oil company operationally involved at the upstream level can confer control over the exploration and extraction process. This degree of state control varies, however, according to the governmental share in the company. In theory, partially state-owned enterprises (SOEs) hold less state command over operational tasks compared to fully controlled companies. This conclusion, however, is certainly not absolute and ought to be balanced against other elements that come into play. A transparent and accountable partially state-owned enterprise, for example, can exert more command over resources, in line with the government's interests, than a corrupt and captured SOE channelling the interests of specific private groups. Yet it is unquestionable that the government's share in the company is a component that may influence the degree of control it can exert on exploration and extraction activities in the oil sector.

Another aspect that should be taken into account are the types of shares that the government has in the national oil company, whether they confer voting rights or not. In Brazil, the legislation allows for the existence of shares with and without voting rights.³³⁷ The Brazilian

³³⁶ Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013).

³³⁷ Law 6,404 of 15 December 1976 (Lei No. 6.404, de 15 de Dezembro de 1976).

Union,³³⁸ for example, has 53.63% of Petrobras' voting capital but only 48.32% of the total capital share.³³⁹ In 2010 the Union significantly increased its participation in Petrobras' total capital share, from 39.80% to 48.32%, which could lead to the false conclusion that its voice in the company had increased. Yet taking into account the Federal Union's voting share in the company, there was a slight reduction from 55.6% to 53.63%, showing that actually its deliberation power had marginally decreased.³⁴⁰

The decision-making process and the governance setting that determines it is also an element to be accounted for in partial SOEs. Generally these types of companies have a board of directors with shareholders representatives. This peculiarity brings issues of corporate governance to the analysis of the degree of state control over operational issues, which can be determinant in defining whether the government has actual control over the national oil company. Michael Whincop when studying corporate governance in government corporations argued that frequently in these companies "the governance game is played 'outside the square' of the formal governmental apparatus".³⁴¹ He explains that governments have multidimensional interfaces with their partially-owned corporations, since they perform multiple and frequently divergent tasks in the company. They are shareholders, regulators and often customers and lenders, among other distinct possibilities. Because of these multifaceted functions and complex interconnections between them, the government can often use one of its roles to leverage its interests in the SOE.³⁴²

This is exactly what has been happening in Petrobras with its pricing policies since 2010. As demonstrated in several chapters of the thesis, the government has been using its influence in the company to resist necessary price adjustments because it holds majority voting share in the Board of Directors and the chair until 26 March 2015 was the influential Minister of Finance. This outcome is particularly striking since, according to Petrobras' bylaws, the Board of

³³⁸ As previously explained, the Union is a legal entity of public Law vested with the Brazilian State's sovereignty. Cf. Alexandre De Moraes, *Direito constitucional* (Editora Atlas 2002) 269

³³⁹ Gesner Oliveira and Sergio Goldbaum, 'A capitalização da Petrobrás em perspectiva' in *Giambiagi, Fábio: Petróleo: Reforma e Contrarreforma do setor petrolífero brasileiro* (Campos 2012) 228.

³⁴⁰ Ibid. 228.

³⁴¹ Michael John Whincop, *Corporate governance in government corporations* (Ashgate 2005) 9.

³⁴² Ibid.

Executive Officers is responsible for the corporation's management. Its article 33, II, (c) clearly mentions that the approval of pricing policies is one of the competences of the Board of Executive Officers and, therefore, it is not an issue under the responsibility of the Board of Directors.

This incident illustrates how the government's influence on the important issue of pricing policies has been played not only "outside the square of the formal governmental apparatus", as suggested by Whincop, but also outside the formal corporate apparatus. The degree of state command over the company with respect to pricing policies has been so blatant that even though the former company's Chief Executive Officer, Gracas Foster, openly defended in the media price increases to bring it closer to international levels, the Minister of Finance's opposition prevented this from taking place.³⁴³ Edmar Luis Fagundes de Almeida stresses that the Minister of Finance is who is normally interviewed about oil price increases and not the CEO, as may have been expected.³⁴⁴ This is unreasonable, since the CEO is the coordinator of the Board of Executive Officers, which is supposed to decide about pricing policies. When asked about these procedures with respect to price increases in Petrobras, one of the interviewees for the thesis, who had occupied a high position in the firm and required anonymity, asserted that pricing policy decisions were taken by the government and then simply endorsed by the Board of Executive Officers.

These actions evidently bring electoral dividends to the government, especially because oil prices significantly affect inflation indexes. Yet they also have substantial repercussions for the company's results, especially on its profitability levels, as has already been argued. Most scholars attribute Petrobras' significant share drop until 2013 to its pricing policies.³⁴⁵ Minority shareholders, on their side, have been increasingly concerned about this situation as revealed

³⁴³ Cf. Cláudia Schüffner, 'Mantega 'vence' Graça no reajuste da gasolina' *Valor Econômico* (Rio de Janeiro) <<http://www.valor.com.br/brasil/3358736/mantega-vence-graca-no-reajuste-da-gasolina#ixzz2mM95wFdk>> accessed 12 May 2014.

³⁴⁴ Edmar Luiz Fagundes de Almeida, 'Seminário GEE2013: Os Desafios da Energia no Brasil' (2013).

³⁴⁵ Cf. Luiz Paulo Vellozo Lucas, 'A derrota de um modelo de sucesso' in Fabio Giambiagi (ed), *Petróleo-Reforma e Contrarreforma do setor petrolífero brasileiro* (Elsevier 2012); and Ana Siqueira, 'O que aconteceu com a Petrobras?' in Fabio Giambiagi (ed), *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro Rio de Janeiro: Elsevier* (Elsevier 2013).

by the declaration of the workers' representative board member Silvio Sinedino. According to him:

"The government has been doing everything it can to suck money out of Petrobras to balance its own books. If the government finds the minority shareholders or employee representatives or the by-laws to be a nuisance they have a remedy: they can fully nationalize the company, buy up the minority shares, but as long as they have minority shareholders, they have to obey the rules".³⁴⁶

Against this backdrop, there is an increasing risk of litigation on these grounds, which would add significant judicial uncertainty to Petrobras' already unsteady corporate performance. These lawsuits could certainly be filed alleging that majority shareowners (the government) have abused their power, according to article 117, paragraph 1 (a) of Law 6,404. The provision considers these shareholders liable for guiding "a corporation towards an objective other than in accordance with its corporate purposes (...)".³⁴⁷ A future landscape of reducing profits could certainly trigger these litigations, even though the outcome is rather uncertain because it can be argued, on the other hand, that the national oil company as a majority state-owned corporation has to accomplish certain state goals which the minority shareholder should abide by.³⁴⁸

Therefore, corporate governance issues are also an essential determinant of the government's actual capacity to exert influence in a state company. It is perfectly possible, for instance, to have a certain NOC with a lower state share than another one, suffering, however,

³⁴⁶ Jeb Blount, 'Petrobras board member lashes out at gov't over oil plan' *Reuters* (Rio de Janeiro) <<http://www.reuters.com/article/2014/06/26/us-petrobras-br-complaint-idUSKBN0F12RI20140626>> accessed 5 November 2014.

³⁴⁷ Article 117, paragraph 1 (a) of Law 6,404 of 15 December 1976 (Lei No. 6.404, de 15 de Dezembro de 1976).

³⁴⁸ This issue has been considered in one case that has been filed by a minority shareholder of one of Petrobras' subsidiary companies, Petroquisa. The plaintiff required indemnification because the company had accepted low value federal bonds in exchange of equity. Justice Massami Yueda, the Rapporteur from the Superior Tribunal of Justice (STJ), considered in his decision that state-owned companies have strategic goals that go beyond simple profit considerations. Yet, since Brazil is a civil Law country, other court decision can have a different outcome. Another significant risk of litigation may also arise in other jurisdictions where Petrobras' shares are negotiated, such as in the United States, for example.

much more governmental interference than its counterpart because its governance rules and procedures allow this greater sway to take place. These rules and procedures include not only explicit, formal and statutory elements, but also the informal, tacit, and cultural aspects, as previously mentioned.³⁴⁹

One simple example related to the rules for nominating board of director members in NOCs illustrates this point. In Norway, as demonstrated in chapter 4, board state representatives in Statoil cannot be civil servants. The main objective of this rule is to avoid the appointed members facing situations of conflict of interest dictated by other policy priorities not related to the oil business. In Brazil, on the other hand, such restrictions do not exist for state appointees in Petrobras and normally influential and high-ranked officials are put forward for the position. Therefore, these elements increase the possibility for the Brazilian government to exert control over the exploration and extraction process through the national oil company, in comparison to Norway. This derives not only from the Norwegian formal rule for its board appointees, but also from the Brazilian cultural tradition of indicating influential and high-ranked civil servants for its NOC's board of directors. This latter cultural aspect of the Brazilian national oil company inevitably imposes a high burden on other board members in challenging the deliberations of powerful government officials in that same position. It also minimises the risks of having governmental appointees not attuned to main governmental policies.

The government's nomination for Petrobras' Board of Directors reinforces a common Brazilian corporate governance problem, which also applies to most Latin American countries. As noted by Filho and Picolin,³⁵⁰ Sanz and Holan³⁵¹ and Silveira,³⁵² differently from the US, where

³⁴⁹ Cf. Charles Oman and Daniel Blume, 'Corporate Governance: A development challenge' (OECD Publishing, 2005) referred to in Joaquim R Fontes Filho and Lidice M Picolin, 'Governança corporativa em empresas estatais: avanços, propostas e limitações' (2008) 42 Revista de Administração Pública 1163 1167; Douglass C North, *Institutions, institutional change and economic performance* (Cambridge university press 1990); and Joaquim R Fontes Filho and Lidice M Picolin, 'Governança corporativa em empresas estatais: avanços, propostas e limitações' (2008) 42 Revista de Administração Pública 1163.

³⁵⁰ Joaquim R Fontes Filho and Lidice M Picolin, 'Governança corporativa em empresas estatais: avanços, propostas e limitações' (2008) 42 Revista de Administração Pública 1163.

³⁵¹ Luis Sanz and P Marín de Holán, 'Reconquistando a confiança de acionistas minoritários' (2004) 82 Harvard Business Review América Latina 36-41 cited in Joaquim R Fontes Filho and Lidice M Picolin, 'Governança corporativa em empresas estatais: avanços, propostas e limitações' (2008) 42 Revista de Administração Pública 1163, 1167.

the property of corporate entities is diffuse and scattered, in Latin America it is highly concentrated. It is usual in these cases for the majority shareholder to significantly exert control over the company's management. Because of this tendency, the usual agency problem between management and shareholders is reduced. The main agency dilemma that arises in these situations is not, therefore, between corporate management and shareholders, but between majority and minority shareholders. This is exactly what happens in Petrobras, where the government's influence over the CEO is evident and frequently occurs to the detriment of minority shareholders. Two of the most evident instances where these dilemmas occur are in pricing and local content policies, where the majority shareholder's will prevails at the expense of the minority owners, who tend to be more sensitive to the company's underlying share value and its profitability.³⁵³

Finally, the incumbent government's ideological views also influence the degree of control it puts forth on the national oil company's production process. In Brazil, for example, the government started using Petrobras as an important public policy implementer after 2010, when the degree of state interference in the economy as a whole and the influence of developmentalist theories became more evident.³⁵⁴ This observable interventionist stance in Petrobras is radically different from the position adopted from 1994 to 2002, under President Cardoso's term. During those years, the company held more operational autonomy from the central government and several market-oriented reforms took place.

This increasing interventionist stance through the use of Petrobras becomes particularly evident in the laws enacted by the 2010 reform, especially article 10, III, c of Law 12,351. The provision spells out that Petrobras should hold a minimum 30% share in all consortia formed to explore pre-salt layers and areas deemed strategic. The Exposition of Motives N. 38 –

³⁵²Alexandre Di Miceli Silveira, 'Governança corporativa e estrutura de propriedade: determinante e relação com o desempenho de empresas no Brasil' (Dphil thesis, Universidade Federal de São Paulo) referred to in Fábio Viana de Moura and others, 'Conflitos de Agência, Legitimidade eo discurso sobre Governança Corporativa: o caso Petrobras') 4.

³⁵³ This happens because minority shareholders are mainly worried about profitability and they are not particularly concerned about certain aspects that are really important for the government such as the impact of oil prices on inflation indexes or the development of a robust industry of national suppliers.

³⁵⁴ David M Trubek, 'Developmental states and the legal order: towards a new political economy of development and law' (2008) 1075 University of Wisconsin Legal Studies Research Paper 1.

MME/MF/MDIC/MP/CCIVIL, which presented the justifications for Law 12,351, contended that this share was a necessary counterpart for Petrobras' operational exclusivity in the mentioned areas, despite not explicitly detailing the reasons for the exclusivity. Since the document mentions that the oil exploration regime should be changed to provide a greater control of the overall production process, what can be deduced is that the 30% share with operational exclusivity are elements that contribute to this increasing control.

Paradoxically, even though this provision has been meant to give more strategic control to the government over the production process, it will have the exact opposite effect. Because of the statutory obligation to be part of all ventures in pre-salt and strategic areas with a 30% share, Petrobras will inevitably face financial and operational constraints to keep up with all the necessary projects to explore such areas. As mentioned by Armando Guedes in an interview with the author: "No oil company in the world has conditions to explore on its own an area as big as the Brazilian pre-salt layers",³⁵⁵ also endorsed by Joao de Lucca.³⁵⁶

Therefore, one of the inevitable consequences of the requirement of having Petrobras in all projects in pre-salt and strategic areas with 30% share and operational exclusivity is that the exploitation rhythm of these areas will no longer be essentially determined according to the government's priorities in a well-defined and elaborated policy. Instead, this pace will primarily depend on the Brazilian national oil company's financial and operational possibilities.³⁵⁷ The government will lose degrees of liberty in the formulation of an essential aspect of energy policies, which is the control over the pace of exploitation. Rather than having more strategic control over the production of oil in Brazil, the government will lose it, exactly the opposite of its alleged intention with the 2010 reforms.

This loss of strategic control over the production process would be significantly mitigated if Petrobras were an entirely state-owned oil company and had a sound and

³⁵⁵ Interview with Armando Guedes, Former President of Petrobras (Rio de Janeiro, 21 July 2012).

³⁵⁶ Interview with Joao de Lucca, President of the Brazilian Petroleum Institute (IBP) (Rio de Janeiro, 05 August 2013).

³⁵⁷ Walter De Vitto and Richard Hochstetler, 'Perspectivas para os investimentos petrolíferos no Brasil' in Giambiagi and Velloso Lucas (eds), *Petróleo-Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2012) 144.

sustainable financial situation. In that case, the government would be entirely responsible for all corporate deliberations and the enterprise would not depend excessively on financial creditors to undertake its decisions. Nevertheless, as detailed in chapter 2, Petrobras is a partially-owned state enterprise with 55.63% of voting shares belonging to the Federal Union.³⁵⁸ Therefore, even though there is governmental control over the company it is still liable to its minority shareholders, according to its by-laws. Even more worryingly, however, Petrobras' exploration schedule is in the short term extremely dependent on the availability of funding because of its lack of immediate financial resources. The direct consequence of this dependency is that creditors have an important voice and influence on the company's exploitation pace. Quite ironically, the provisions requiring exclusivity and a 30% share in all strategic and pre-salt areas indirectly transferred strategic control over the production process from the government to Petrobras and financial creditors.

Petrobras is a partially state-owned national oil company, which is not usual in the world, where several NOCs belong entirely to the state.³⁵⁹ Notwithstanding the governmental control of the company, with 55.36% of voting shares, this majority is not overwhelming. Its formal corporate governance rules, in turn, are considered adequate according to international standards, in terms of minority shareholder protection and are inscribed in its corporate bylaws.³⁶⁰ These factors would normally lead to the inference that the degree of state control over the company is not significant, at least by relative global standards. The natural conclusion would therefore be that the government's influence in the production process through the company is not substantial, taking only these elements into account. Nevertheless, informal state intrusiveness in Petrobras' corporate governance and the government's increasing economic interventionist stance since 2010, especially in the oil sector, contribute to an increasing state command over the production process through the national oil company.

³⁵⁸ Gesner Oliveira and Sergio Goldbaum, 'A capitalização da Petrobrás em perspectiva' in *Giambiagi, Fábio: Petróleo: Reforma e Contrarreforma do setor petrolífero brasileiro* (Campos 2012) 228.

³⁵⁹ Cf. Valerie Marcel, *Oil titans* (Brookings Institute 2006); David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011); and Baker Institute, 'Baker Institute Policy Report' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

³⁶⁰ Cf. Petrobras, 'Governance' <<http://www.petrobras.com/en/about-us/governance/>> accessed 6 October 2014.

The informal corporate governance element that allows this increasing control is the culture of appointing influential high ranked civil servants as board members from the economic area. This tradition undermines resistance from minority shareholders and intensifies the situations of conflict of interests between corporate and macroeconomic issues.

Considering state interventionism, historically Petrobras has been deemed a national oil company with relatively low degree of government intrusiveness in operational activities, compared to other NOCs.³⁶¹ Yet this characteristic has been changing since 2010 because of the previously mentioned factors. The interference is particularly acute with respect to pricing and local content policies. While in the first case necessary oil price increases have been postponed to tackle inflation, in the second one Petrobras has become an essential instrument of governmental local content policies, which essentially depend on its purchases in pre-salt and strategic areas.³⁶²

The statutory reforms, which aimed to assign a leading role to Petrobras in the production process, undermine rather than boost the state's control over oil supply. This happens because crude supply will vary according to the company's own financial and operational possibilities, instead of following main state policies decided by the Executive. Yet other elements not inscribed in laws, such as informal corporate government practices and the government's ideological views towards state interventionism in regulated sectors, have been contributing to an increasing state command over production.

PRESENCE OF A STATE REPRESENTATIVE ENTITY

The presence of a state-owned enterprise not directly producing oil but essentially monitoring, overseeing and controlling the production process is another way of asserting increasing command over crude supply.

³⁶¹ David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011).

³⁶² This topic will be further examined in chapter 7.

In Norway Petoro performs this task in blocks where the Norwegian state participates via the State's Direct Financial Interest (SDFI).³⁶³ Through the SDFI the state obtains rights over the oil projects it chooses.³⁶⁴ Petoro is responsible for the administration of the SDFI. It does not hold operational duties and its "main objective is to maximise the economic value of the state's oil and gas portfolio on the basis of sound business principles."³⁶⁵ Because it has a share in the Norwegian blocks it deems financially lucrative with the right to veto any decision of the operational committees formed to explore the oil, it can influence production levels in the country.³⁶⁶ Yet its veto prerogative has never been used and its intervention is essentially focused on the financial profitability of the ventures and on asset management.

PPSA, in Brazil, is also an entirely state-owned enterprise which holds a minimum 50% participation in all the constituted consortia for exploiting oil in pre-salt and strategic areas in Brazil. PPSA actually has the ability to influence all major operational decisions in the consortium because of its minimum 50% share in the operational committees which should be formed to explore oil in pre-salt and strategic areas. Yet PPSA does not exert any operational activity.

The difference between PPSA and Petoro is that the latter participates financially in the projects it deems commercially rewarding and also enjoys discretion in deciding the ventures it will be part of. PPSA, in contrast, mandatorily joins all consortia exploring pre-salt and strategic areas in Brazil, without contributing capital of any kind.

The creation of PPSA through Decree N. 8,063 and Law 12,304 enables the Brazilian state to effectively exert control over the production process. With its mandatory 50% share in operational committees, the company can command operational decisions to its own best

³⁶³ The SDFI is an accounting mechanism created in the Norwegian national budget, which guarantees to the state the right to a percentage share in the oil blocks it deems of its interest. The net cash flow of SDFI's portfolio is automatically transferred to a Government Pension Fund, which previously used to be the Petroleum Fund. See discussion in chapter 4.

³⁶⁴ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011).

³⁶⁵ Available at: <http://www.petoro.no/about-petoro/main-objective-vision-and-values> accessed 24 October 2014.

³⁶⁶ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 232.

interests, as long as the deliberation quorum forms a simple majority. Chapter 6 will demonstrate that this high share can be significantly increased in the government's interest if PPSA votes in accordance with Petrobras, which has a minimum 30% share at the operational committee. The next chapter will show that it is not difficult to envisage situations in which these two entities might align their interests to deliberate uniformly, especially considering the higher governmental influence in the national oil company after 2010.

The state's actual capacity to influence the production process via PPSA, comes, however, at a price, which is the significant drawbacks related to investments, analysed in chapter 6, and technology and innovation, examined in chapter 8. The shortcomings essentially arise from agency and moral hazard problems created by the statutory provisions that detail PPSA's structure and its decision-making procedures in operational committees.

The desired increasing control over the production process in Brazil could have been achieved avoiding these drawbacks. The creation of PPSA for this specific reason is not justifiable. Petrobras is a dominant firm in the Brazilian oil sector, with extensive participation and command over technology to explore oil fields in the country. Since the state is the company's majority shareholder, it would have been perfectly possible for the government to influence crude supply according to its own priorities even before the 2010 reforms.³⁶⁷ On the other hand, if the concern is the predatory exploitation of reserves, ANP has the expertise and regulatory power to conduct the necessary inspections and take the required corrective procedures in these cases.

Another reason given for the existence of PPSA is the need to have a state entity carefully monitoring and overseeing the exploration companies' accounts, especially their costs. As outlined in chapter 2, the main distinctive feature of production-sharing regimes is that the property of the extracted oil belongs to the state.³⁶⁸ After extraction, the production costs, labelled as "cost oil", are reimbursed to the producing oil companies, while the remaining "profit

³⁶⁷ This would have to be done with extreme caution not to undesirably increase the use of Petrobras for political issues. All of the undertaken decisions would have to be extensively detailed and justified.

³⁶⁸ See previous discussion in Section 3.5.

oil” is split between state and producers. The percentage of “profit oil” that goes to each can be determined in several ways. In Brazil, an open bidding round, in which competing companies present their offers, starting from a minimum level previously stipulated in the Tender Protocol, sets the share between state and producing oil companies.

One of PPSA essential functions as the manager of production-sharing agreements is to carefully assess the oil companies’ “cost oil” to make sure it is not inflated or exaggerated. This control is certainly important to avoid a moral hazard situation, whereby producing companies shrink the level of profit oil left for the state to a minimal undesirable level. Notwithstanding its obvious importance, this task need not necessarily be performed by PPSA, since ANP holds enough technical expertise for it and is already a consolidated entity in the Brazilian oil sector. Actually these monitoring and oversight functions performed by PPSA with respect to production-sharing agreements are typical regulatory tasks.³⁶⁹ Hence, ANP could perfectly be responsible for them, avoiding, as a result, several problems that the creation of PPSA has engendered.

³⁶⁹ Antônio Luís de Miranda Ferreira, ‘Problemas e inconsistências jurídicas do novo marco regulatório: a ótica dos princípios Constitucionais da livre iniciativa, da economia de mercado e do direito comercial’ in FABIO GIAMBIAGI (ed), *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* Rio de Janeiro: Elsevier (2013) 192.

APPROVAL OF DEVELOPMENT PLANS, WORKING PLANS AND THE DECLARATION OF COMMERCIALITY

ANP is responsible for approving the development and working plans, as well as the declaration of commerciality in production-sharing agreements.³⁷⁰ These competences confer on the agency the actual possibility of exerting indirect control over the production process.³⁷¹ In the case of concession contracts, this opportunity is granted first through the assessment of the working plans during the bidding process.³⁷² The working plan is a detailed list of procedures and activities that the operational companies intend to put into action in the areas they will explore. This plan will be further specified at the moment of the signature of the contract.³⁷³ In production-sharing agreements the annual working plans are prepared by the winning consortium and submitted for ANP's consideration.

At the end of the exploration phase the oil companies can either declare the commerciality of the blocks they had been exploring or return them to the Union. In case of concession contracts the companies exploring oil declare unilaterally the commerciality of the blocks.³⁷⁴ In production-sharing agreements they ought to be approved by ANP, according to article 24, III of Law 12,351. Such provision shows again the government's aim to exert more control and oversight in strategic areas. This task is perfectly legitimate and consistent with ANP's regulatory functions. Yet one limitation that the requirement entails is the excessive bureaucratisation of the approval process, since three governmental entities respectively decide on it. First, Petrobras, which is responsible for elaborating a report on the commerciality of a certain area.³⁷⁵ PPSA then deliberates on the issue, when it is submitted to the operational committee.³⁷⁶ Finally, ANP is the last entity to assess and approve the declaration of

³⁷⁰ Article 11, V and Article 24, III of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

³⁷¹ If ANP does not approve a certain working plan or the declaration of commerciality the proponent companies would have to submit new proposals or reconsider even their projects, which in most situations would affect production levels.

³⁷² Article 41, I of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997).

³⁷³ Article 43, III of *ibid.*

³⁷⁴ Article 24, paragraph 1 of *ibid.*

³⁷⁵ Article 30, III of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010)

³⁷⁶ Article 24, III of *ibid.*

commerciality. Even though each one of these three entities considers the plan from a different perspective, it is undoubtedly counterproductive to have three governmental entities deliberating on the same issue. The same procedures apply for the approval of development and working plans.

As will be further proposed and detailed in chapter 9, PPSA's functions can be perfectly eliminated, since the problems they create for a successful governance of the Brazilian oil sector far outweigh any effective contribution. In this specific case, Petrobras' propositional role when elaborating a report on the commerciality of areas and the working and development plans is essential because of its operational functions in pre-salt and strategic areas. ANP's regulatory tasks are also fundamental and cannot be eliminated. Yet the same thing cannot be said about PPSA, since its duties in the examination of the declaration of commerciality, development and working plans can perfectly be performed by ANP with a clearer purpose, a wider and more integrated sectorial approach.

5.1.3 CONTROL OVER THE REFINING OF OIL

As previously mentioned, one way for governments to assert increasing command over the production process is through the control of the refining of oil. The 2010 reform in Brazil did not modify any aspect related to this activity. Therefore, the natural conclusion would be that alterations in the regulatory framework did not affect this specific aspect.

The inference about control of refined oil should, however, be analysed and considered against the backdrop of Petrobras' strategies and actions, considering the whole productive oil chain. Since there is a natural limitation to corporate investment capacity, Petrobras as any other verticalised oil company, faces opportunity costs when investing in one level of the production chain, because financial disbursements on one specific stage mean less available funds for other segments of the supply chain. In the case of a company with severe financial limitations and overburdened with capital expenses, such as Petrobras, this trade-off between the downstream and upstream levels is increasingly acute.

The demand for refined oil had been consistently increasing in Brazil until the second half of 2014, having surpassed its supply, especially because national prices were compressed, if compared to the international market.³⁷⁷ This pricing policy had sweeping repercussions beyond the immediate short-term corporate losses.

One of its often-neglected important shortcomings was the gradual shift in Petrobras' investment priorities. The increasing demand for refined products at the downstream level, because of the subsidies, led Petrobras to progressively transfer part of its focus and funds from the more profitable upstream sector, where it holds its most significant competitive advantages, to the less promising downstream segment.³⁷⁸ This shift in priorities occurred because of the need to provide adequate levels of refined oil supply to the country. From 2011 to 2014 the company has registered an accumulated loss of \$26 million at the downstream level.³⁷⁹ Yet even more problematic is that because of this policy, other oil companies which had been investing in oil refining after the opening of the sector to private enterprises in 1995, have been closing down, since they cannot afford to compete with a dominant player consistently subsidising their products and even incurring significant losses.³⁸⁰ As a result, today Petrobras is one of the only companies refining oil in Brazil, which deviates it further from the lucrative upstream sector and intensifies the distortive and dysfunctional effects of its pricing policy in a vicious cyclical effect. As illustrated by Edmar Luiz Fagundes de Almeida: "today Petrobras has to fight a war on two fronts in the Brazilian oil sector both at the upstream and the downstream levels".³⁸¹

Another hurdle must be added to this equation. First, because the country has a diversified and flexible energy matrix, it is very difficult to forecast the actual demand for refined oil because consumers have several options. This demand predictability problem is aggravated by the fact that energy policies in the country have been extremely volatile and unpredictable, in some moments incentivising the consumption of certain fuels, such as natural

³⁷⁷ Edmar Luiz Fagundes de Almeida, 'Seminário GEE2013: Os Desafios da Energia no Brasil' (2013).

³⁷⁸ Ibid.

³⁷⁹ Amrita Sen and others, 'Brazil's Struggles' Energy Aspects - In Focus <<https://www.energyaspects.com/publications/view/brazils-struggles>> accessed 15 June 2015.

³⁸⁰ Edmar Luiz Fagundes de Almeida, 'Seminário GEE2013: Os Desafios da Energia no Brasil' (2013).

³⁸¹ Ibid.

gas (GNV) and biomass alcohol, while abandoning these same policies in other instances.³⁸²Therefore, Petrobras faces not only the problem of increasing demand at the downstream level but also the fact that the demand is volatile and unpredictable.

Hence, the national oil company's increasing capacity to control the supply of refined oil through increasing production amounts actually reduces the command it has at the upstream level, which is the company's core business and where it holds significant worldwide expertise and competitive advantage. Paradoxically and in contrast to the logic of institutional economics, which claims that firms tend to verticalise to reduce transaction costs and increase their efficiency levels,³⁸³ Petrobras' vertical structure has been significantly affecting its cost upswing because of downstream subsidies and the responsibility for matching national demand at this level.

5.1.4 CONTROL OVER THE COMMERCIALISATION OF CRUDE OIL

The new regulatory framework allowed the state to have a tighter control of the commercialisation of crude oil. According to article 45, sole paragraph of Law 12,351 and article 2 of Law 12,304, PPSA will be responsible for contracting a company to commercialise the oil assigned to the state in production-sharing contracts. Petrobras can be directly contracted for this task without organising public tenders.³⁸⁴

As already described, one of the peculiarities of the Brazilian production-sharing regime is that the profit oil is not appropriated by the state financially but via tangible crude oil. This unique feature certainly allows the state to have physical control over the commodity and therefore to strategically command its sale according to its needs. Here again the increasing control over the commercialisation of oil comes at a price, which is the creation of a significant transaction cost for the government to perform this activity. Instead of the profit oil being transferred to the state financially by the producing company, Petrobras, it is given in kind and

³⁸² Ibid.

³⁸³ Cf. Oliver E Williamson, 'Transaction cost economics: the precursors' (2008) 28 Economic Affairs 7

³⁸⁴ Article 45, Sole Paragraph of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

further sold by a firm that PPSA will hire for this task. The immediate question that arises then is what are the advantages for the government to receive this profit oil in kind? Does this benefit outweigh the implicated transaction costs in receiving the physical commodity and then commercialising it? Section 5.3 will consider these queries.

5.2 GREATER APPROPRIATION OF WEALTH COMING FROM THE EXPLORATION OF OIL ACTIVITIES

The urge to increase the amount of state appropriation of oil production's proceeds for the overall social benefit was the second justification for the 2010 legal changes. The rationale for this argument was that the discovery of the immense oil deposits in pre-salt areas presented new conditions of low risks and high gains to potential explorers, which therefore demanded higher appropriation levels than established in Law 9,478.³⁸⁵ The incumbent government claimed that this higher appropriation level would be attained through the legal framework established in Law 12,351.

Paragraphs 3 and 7 of the Exposition of Motives N. 38 – MME/MF/MDIC/MP/CCIVIL clearly set forth this concern of higher rent appropriation. Former President Lula and his Minister of Mines and Energy Edison Lobao emphasised this discourse in several other public appearances. President Dilma made similar statements in her speech after the first public tender using Law 12,351.³⁸⁶

Paradoxically as it may seem, the abovementioned Exposition of Motives claims that the new regulatory framework will allow this higher rent entitlement but does not mention how it will take place or what specific provisions or mechanisms will account for a higher share. It seems to directly associate a lower government take³⁸⁷ to the regulatory framework established

³⁸⁵ Even though government officials claim that exploration in the pre-salt area presented conditions of low risks and high gains, they remain silent about the costs involved in these activities, which are considered quite significant. This topic will be further explored in the thesis.

³⁸⁶ Juliana Braga, 'É 'bem diferente' de privatização, afirma Dilma sobre leilão do pré-sal' *O Globo* (21 October 2013) <<http://g1.globo.com/economia/noticia/2013/10/e-bem-diferente-de-privatizacao-afirma-dilma-sobre-leilao-do-pre-sal.html>> accessed 18 September 2014.

³⁸⁷ Government take is a terminology used in oil literature that designs all taxes and state appropriations of the oil production.

in Law 9.748 and a higher rent appropriation to the new one, without detailing or comparing amounts or any percentage of fiscal revenues between the two statutes.³⁸⁸ All the explanations provided in the Exposition of Motives are superficial and do not address the main issue, i.e.: how will the changes provided guarantee a higher government take in relation to Law 9,748? The extracts below, from the justifications in Exposition of Motives N. 38 – MME/MF/MDIC/MP/CCIVIL, show the maximum level of detail provided in the explanations:

“This model,³⁸⁹ in which the concessionaire faces all the exploration risks and reaps all the earned benefits, is incompatible with the existing conditions of the pre-salt area. (...) The estimated exploratory risks in these areas are significantly low, while the profitability is considerably high. This requires a regulatory framework which ensures the predominance of the national interest, through a greater control of the potential wealth by the Federal Government and a higher share of its proceeds, for an overall social benefit.

(...)

The new contractual design is necessary in a context of low geological risk, with significant rent surplus, which should be maximised by the State and reverted to the society through actions for poverty reduction and development of the education, culture, environmental sustainability, science and technology.”³⁹⁰

One of the most common criticisms for this explanation is that a simple modification of infra-legal norms could have met this objective, without the need to alter existing regulatory oil laws.³⁹¹ Actually, Law 9,478 contemplates the possibility of levying a special participation tax, which is a kind of windfall profit tax, to production volumes or profitability levels considered to

³⁸⁸ As previously explained, Law 9,478 does not apply to the pre-salt area.

³⁸⁹ The regulatory framework established in Law 9.478, where the exploration of oil and gas is to be done according to concession contracts.

³⁹⁰ Personal translation of Paragraph 7 of Interministerial Exposition of Motives N. 38 – MME/MF/MDIC/MP/CCIVIL, 31 of August 2009. Available at < http://www.planalto.gov.br/ccivil_03/projetos/expmotiv/emi/2009/38%20-%20mme%20mf%20mdic%20mp%20ccivil.htm> accessed 13 October 2013.

³⁹¹ Guilherme Dias and Alfredo Renault, ‘A concentração de recursos na União e as perdas das regiões produtoras’ in Giambiagi and Lucas (eds), *Petroleo Reforma e contrarreforma do setor petrolifero brasileiro* (Elsevier Editora Ltda 2013)153, 178.

be significant.³⁹² The threshold for its incidence varies according to the complexity involved in the location for oil extraction.³⁹³ Law No. 9,748 specifies that a presidential decree will detail the incidence procedures of the special participation in cases of significant profit or production volumes of oil. Decree No. 2,705 was enacted for this purpose and provides the details for its application. A simple change in this decree would suffice to meet the goal of increasing the government take of oil activities in Brazil. The President, without the need of altering the whole regulatory oil framework, could have done this modification. It would have avoided the submission of a bill of Law to Congress and the opening of a time-consuming debate about the distribution of royalties among federative entities.

Of course this federative debate about the distribution of state revenues is legitimate and desirable, especially in occasions where they are expected to rise significantly, such as after the discovery of new and promising reserves. Yet this need to rethink the share of federative entities of oil proceeds was never pointed out as a reason for changing the regulatory framework. Besides, if that were the case, it could have also been done in the context of an amendment of Law 9,478 and would not have necessarily required the enactment of three new statutes.

In interviews conducted by the author with thirty-four oil sector specialists between the years of 2012 and 2013, ten interviewees agreed that a simple infra-legal modification could have met the objective of increasing the government take of oil activities.³⁹⁴ There seems to be a widespread acceptance of this view among oil specialists that are not working as civil servants or in Petrobras. Only two interviewees among this group did not explicitly agree with this position. Among the group of civil servants and Petrobras employees, those that disagree with the statement, do not refute it either, but resort to arguments related to other intentions in the legal changes and wider objectives and aspirations of the statutes not necessarily linked to this

³⁹² Article 50 of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997).

³⁹³ In oil fields situated on land, in the first year, special participation payments should occur at the production volume of 450.000 cubic meters of equivalent petroleum per quarter. This amount will rise to 900.000 in areas of the continental platform in depths up to 400 meters, and to 1.350.000, for deeper extractions. In the second year of production, all these amounts will be reduced, the same occurring in the third year. From the fourth year onwards the amounts will be the same as in the third year.

³⁹⁴ See introduction for a more detailed explanation about the interviews.

specific topic. This group is understandably less vocal in expressing their opinions about the topic.

Paradoxically, as pointed out by Paulo Cesar Ribeiro Lima,³⁹⁵ it is even possible that the modifications provided by Law 12,351 decrease the government share over oil activities in Brazil. That could perfectly happen for three main reasons. First, unlike Law 9,478, Law 12,351 does not have any specific provision accounting for a higher governmental appropriation in case of significant levels of production or profitability, as the Special Participation tax.³⁹⁶ Second, the new regulatory framework does not stipulate a minimum percentage level for royalties or for cost oil recoupment, as previously mentioned. Third, investors and oil companies will most probably reveal reluctance with respect to the new Brazilian regulatory regime, therefore tending to invest less in the Brazilian oil sector after the 2010 reform.³⁹⁷ Fewer investments lead to reduced production levels and tax amounts.

The absence of a clear, straightforward and rational justification for the reasons presented in this section for changing the oil regulatory framework may give rise to two assumptions: i) other justifications explain the change; or ii) even though a rational causal link between the objectives and the legal change itself has not been provided, it exists and is plausible.

An analysis of the literature reveals, however, that the second assumption is not justifiable. First, there is a clear convergence among scholars around the conclusion that different levels of government take can be attained using the concession and production-sharing regimes and that there is no inherent superiority of one model in relation to the other in this

³⁹⁵ Paulo César Ribeiro Lima, *Pré-sal, o novo marco legal e a capitalização da Petrobras* (Synergia Editora 2011) 27.

³⁹⁶ Article 45, III of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997).

³⁹⁷ There is a vast literature in regulation showing that a higher level of state interference in regulated markets decrease “coeteris paribus” the amount of investments to that specific sector. Cf. Brian Levy and Pablo T Spiller, ‘A framework for resolving the regulatory problem’ (1996) *Regulations, institutions and commitment* 1; Stefan Voigt and Eli M Salzberger, ‘Choosing not to choose: When politicians choose to delegate powers’ (2002) 55 *Kyklos* 289.

particular aspect.³⁹⁸ Second, there is nothing special in the way the production-sharing regime is applied in Brazil according to Law 12,351 that guarantees a superior government take in relation to the concession framework used in Law 9,478.³⁹⁹ This position is predominant among specialists that have analysed the new Brazilian model.⁴⁰⁰ In a similar vein, in the interviews conducted for this thesis, all experts were unanimous in agreeing with these points. Therefore, everything seems to lead to the conclusion that the reasons for the legal change are elsewhere.

One possibility is that the motive for the reform is exclusively related to an increasing control of the production process, analysed in section 5.1. Another alternative is the existence of another explanation for the change that is not evident and could not be clearly publicised by the government. Everything seems to indicate that this latter option is what actually occurred.

One aspect of the change that has never been pointed out by proponents but has been detected by Guilherme Dias and Alfredo Renault is the concentration of financial resources in the hands of the federal government.⁴⁰¹ The regulatory framework enacted in 2010 provided for the use of a production-sharing regime in pre-salt and strategic areas. The government take in this regime takes place through the payment of royalties and of profit oil in kind. The proceeds of profit oil, after its commercialisation, in turn, will accrue to the Social Fund, where the federal government has an increasing share. The Special Participation tax, which is levied in the concession regime, according to Law 9,478, is not charged in production-sharing agreements under Law 12,351. A significant portion of the Special Participation tax is channelled to states

³⁹⁸ Cf. Guilherme Dias and Alfredo Renault, 'A concentração de recursos na União e as perdas das regiões produtoras' in Giambiagi and Lucas (eds), *Petroleo Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2013)156; and Edmar Luiz F de Almeida and Vinícius Accurso, 'Government take e Atratividade de Investimentos na Exploração e Produção de Hidrocarbonetos no Brasil' (2013).

³⁹⁹ Guilherme Dias and Alfredo Renault, 'A concentração de recursos na União e as perdas das regiões produtoras' in Giambiagi and Lucas (eds), *Petroleo Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2013)153,178.

⁴⁰⁰ Cf. Paulo César Ribeiro Lima, *Pré-sal, o novo marco legal e a capitalização da Petrobras* (Synergia Editora 2011); Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013); Carlos Jacques Viera Gomes and others, 'Avaliação da proposta para o marco regulatório do pré sal' (Centro de Estudos da Consultoria do Senado federal Textos para discussão, 2009); Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); and Luiz Cezar Quintans(ed), *Contratos de Petroleo Concessao e Partilha Propostas e Leis para o Pre-Sal* (B. Biz Editores 2011).

⁴⁰¹ Guilherme Dias and Alfredo Renault, 'A concentração de recursos na União e as perdas das regiões produtoras' in Giambiagi and Lucas (eds), *Petroleo Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2013).

and municipalities. Therefore, the non-incidence of the Special Participation tax and the financial resources from profit oil channelled to the Social Fund concentrated more resources within the federal government. Of course this rationale for changing the framework could not be openly divulged because it could lead to a political backlash of subnational entities and create or intensify federative political disputes. As already mentioned, this federative clash has already been taking place with respect to the discussion of the division of royalties between producing and non-producing states.

Other possibilities for the change in the regulatory framework include the aim to mark a clear change with respect to the previous institutional setting, because of the symbolic element of a legislation reform with the insertion of social goals. This symbolic message is particularly appealing to the working party's electorate, especially taking into account that the government of President Lula had been following an economic policy that departed from the traditional leftist agenda. This is a tendency that could have also affected other areas such as foreign policy, for example, in which President Lula's discourse is more appealing to the historic agenda of the Brazilian working party.⁴⁰²

5.3 GREATER STRATEGIC CONTROL OF OIL: WHAT FOR?

Section 5.2 concluded that nothing guarantees that the 2010 reforms will allow a greater strategic control coming from the appropriation of wealth in the exploration of oil activities. In contrast, section 5.1 demonstrated that the new framework enables in some specific instances an increasing governmental sway over the exploration, extraction and commercialisation of oil. Following on from this analysis, this section will examine how this increased control can be used and what are the possible implications of its employment.

Considering, therefore, these possibilities of greater command over the production process, the essential question to be asked is: what can this increasing strategic control be used for? There are two possibilities: i) the option of having oil inventories for emergency situations

⁴⁰² Paulo Roberto de Almeida, 'Uma política externa engajada: a diplomacia do governo Lula' (2004) 47 *Revista Brasileira de Política Internacional* 162.

and ii) the possibility of deriving some sort of geopolitical or trade advantage as a result of a supposed stricter control of the product.

The first option of having oil for emergency situations is certainly desirable and necessary, considering the essential value of oil for the economy and for the country as a whole. Yet this urge does not necessarily require the government to stock oil, hold the product in kind or control its commercialisation, as implied by the 2010 reforms. All these activities pose significant transaction costs, as already mentioned. It would be desirable to bear these expenses if their resultant outcomes more than compensated for the inevitable burden incurred. In other words, if oil for emergency situations could not be otherwise supplied at a lower cost. Nevertheless, the Brazilian Federal Constitution in its article 17, § 2, I, and Law 9,478, in its article 1, V, provide for the guarantee of oil supply in Brazil. For this specific purpose, in emergency situations the President of the Republic upon CNPE's proposal can require oil companies operating in Brazil to provide part of their production for the proper operation of the National System for Fuel Reserves.⁴⁰³ This guarantee has existed since 1995, way before the 2010 reforms. Since emergency situations are not recurrent but rather isolated and remote, it is uneconomical and unreasonable to hold inventories and create a whole new structure with all the resultant transaction costs for stocking oil in kind preparing for these infrequent and unforeseen circumstances.

The second alternative of deriving geopolitical or commercial advantages out of an increasing control over oil production is certainly desirable, especially by directing exports to markets that are geopolitically more important for the country. Yet this initiative has to be exerted cautiously, under the overarching principle that these non-commercial aspects cannot significantly affect national production levels and long-term profitability. As demonstrated in chapter 4, national oil companies such as NNPC in Nigeria and PDVSA in Venezuela have been facing excessive interference in their daily routines for the most diverse political reasons, at the expense of their operational results. Other national oil companies such as the Malaysian

⁴⁰³ Daniela Couto Martins, *A Regulação da Indústria do Petróleo: segundo o modelo constitucional brasileiro* (Fórum 2013) 197,198.

Petronas, in contrast, have been able to successively reconcile geopolitical non-commercial goals with positive corporate outcomes.⁴⁰⁴ The analysis provided in chapter 4 on national oil companies demonstrated that these non-commercial goals can be best attained when they are enduringly sustainable and resistant to short-term political urges that excessively drain corporate resources. Statoil, Aramco and Petronas, for instance, have been balancing non-commercial and commercial objectives without jeopardising corporate efficiency and performance.⁴⁰⁵

As will be described in chapter 6, an episode in 2006 involving the nationalisation of Petrobras' gas installations in Bolivia is an illustrative example of how the geopolitical concerns can put corporate priorities at risk in Brazil. On that occasion, despite the national oil company's intensified pressure on the government of Bolivia for a fair compensation, President Lula adopted a conciliatory negotiating stance. He considered the Brazilian foreign policy interests of South-American integration as a priority not to be put at risk, which prevailed over Petrobras' corporate interests.⁴⁰⁶ These actions, when exerted occasionally and for specific strategic purposes that accrue to the country's sustainable benefit are not problematic. Yet if they assume a more regular and continuous nature of exclusively short-term gains they can drain invaluable resources from the country putting at risk the sustainability of the business.

5.4 CONCLUSION

The chapter's main goal was to analyse whether the 2010 reforms provide a greater strategic control of oil, considering that this was the principal governmental justification for the change. Two main aspects were examined, taking into account what the incumbent government's understanding of the term strategic control of oil was. First, the need to improve

⁴⁰⁴ Fred von der Mehden and Al Troner, 'Petronas: a national oil company with an international vision' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

⁴⁰⁵ Donald Hertzmark, 'Pertamina: Indonesia's State-Owned Oil Company' (The Changing Role of National Oil Companies in International Energy Markets, 2007).

⁴⁰⁶ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 181.

the state's appropriation of oil production for the overall social benefit; second, the urge to provide a greater control of the potential wealth.⁴⁰⁷

Nothing guarantees that the 2010 reforms will allow a greater strategic control coming from the appropriation of wealth in the exploration of oil activities. The new framework enables in some specific instances an increasing governmental control over the exploration, extraction and commercialisation of oil. These possibilities come, however, at a price for the sector, especially in terms of drawbacks on investments, as will be demonstrated in the next chapters. Considering that there is a possibility of increasing control over the oil sector, the natural questions that follows is what it should be exerted for. The options examined in the chapter demonstrated that the only plausible alternative was the option of deriving some sort of geopolitical or non-commercial advantage of a stricter control over oil production. Yet this possibility should be exerted with extreme caution so as not to excessively affect production levels and the sector's overall profitability.

Therefore, the main conclusion is that the 2010 reform will only allow an increasing strategic control of oil in some very specific cases, at a significant cost. The government could have reached this exact same objective mitigating the pinpointed shortcomings, had it used a less intrusive regulatory model, based on a top-down approach and command and control principles. This will be one the arguments of the next chapters, especially chapter 9, which will demonstrate what modifications should be made to the current regulatory framework to minimise the shortcomings on investments, production levels, technology and innovation.

⁴⁰⁷ According to the Interministerial Exposition of Motives N. 38 – MME/MF/MDIC/MP/CCIVIL, 31 of August 2009. Available at <http://www.planalto.gov.br/ccivil_03/projetos/expmotiv/emi/2009/38%20-%20mme%20mf%20mdic%20mp%20ccivil.htm> accessed 13 October 2013.

6 - INVESTMENTS

The oil industry's upstream segment is highly capital intensive. The sector's capital expenditures (CAPEX) to sales ratio is approximately 17%, while the average percentage rate for industries in general is somewhere between 6 and 7%.⁴⁰⁸ Sectoral start-up capital requirements are normally so significant that they are considered an important industrial barrier to entry.⁴⁰⁹ Oil companies' stock exchange values, moreover, are directly dependent on the amount of proven productive reserves they own. This demands constant investments for the discovery of new production areas to replace the old and less productive locations and to cope with the depletion rates of current reserves. A standard petroleum field normally has an average life span of 15 to 20 years and an annual depletion rate that varies from less than 3%, in newer locations, to more than 10%, in more mature areas.⁴¹⁰ For a given annual depletion rate of 5%, after 10 years 50% of the current production level ought to be replaced by new ones.

Oil companies are therefore constantly exploring new production frontiers and investing in innovative technologies to gain access to them. The high risks associated with the significant investment amounts are another feature of the oil industry. Assets at the exploration and production phase are considered sector specific. Alternative uses are therefore costly and rarely possible and sunk costs, as a result, significant. High sunk costs have an adverse effect on investment decisions. Geological risks involved are equally paramount. The average exploration success rate at the upstream sector in the last 13 years has been of approximately 25%. In other words, on average three out of four exploration wells will not lead to oil discoveries in a commercially viable amount.⁴¹¹ This is one of the reasons for companies' tendency to diversify their activities as much as possible around the globe. By having a diversified international exploration portfolio, they reduce the chances of not finding oil in viable commercial amounts.

⁴⁰⁸ This refers only to Europe and the US. Cf. Nadine Bret Rouzaut and Jean Pierre Favennec, *Petóleo & Gás Natural: Como Produzir e a que Custo* (Synergia 2011) 162.

⁴⁰⁹ Helder Queiroz Pinto Jr and Mariana Iooty, 'Perspectivas de Desenvolvimento do Setor Petróleo e Gás no Brasil' (2010) 55 *Serie Eixos do Desenvolvimento Brasileiro*.

⁴¹⁰ Nadine Bret Rouzaut and Jean Pierre Favennec, *Petóleo & Gás Natural: Como Produzir e a que Custo* (Synergia 2011) 161.

⁴¹¹ *Ibid.* 162.

Technology, in turn, is one of the main investment components in the oil industry and is expected to gain even more relevance in the future. Most of the easier exploration oil fields around the globe have already been discovered and future findings are forecasted to happen in areas of more difficult access, where exploration techniques require sophisticated equipment, of higher cost. In the Brazilian pre-salt area, for example, investments in technology are significant and considered one of the main challenges for viable future production.⁴¹²

It is quite evident, therefore, why investments are so important in the upstream oil sector. The discovery of the pre-salt oil deposits has only been possible because of the continuous projects undertaken by Petrobras in offshore areas. They all involved significant investment amounts and the development of complicated technologies to extract oil at a 5km depth, beneath 2 km of thick salt layers. The prospects for developing production further in the area, moreover, involve considerable future disbursements. The Brazilian Bank for National Economic and Social Development (BNDES) estimates investments of between US\$ 264 billion and US\$ 742.5 billion are necessary in the Brazilian oil sector until the year 2027.⁴¹³ Petrobras' investment plan for the period 2012 to 2016 amounts to US\$ 237 billion and is considered to be the most ambitious corporate investment programme in the world.⁴¹⁴

One of the important rationales for creating independent and autonomous regulatory agencies and delegating to them certain competences that affect market decisions is the assurance that these entities will not suffer political pressure to unduly interfere in business activities.⁴¹⁵ This confers more predictability, certainty and credibility to the sector, fostering, as a consequence, investments to the regulated industry. When referring to the delegation process from governmental branches to agencies, Paulo Correa et al. suggest "The degree of delegation

⁴¹² Helder Queiroz Pinto Jr and Mariana Iooty, 'Perspectivas de Desenvolvimento do Setor Petróleo e Gás no Brasil' (2010) 55 Serie Eixos do Desenvolvimento Brasileiro.

⁴¹³ Edmar Luiz de Almeida and Vinícius Accurso, 'Government take e Atratividade de Investimentos na Exploração e Produção de Hidrocarbonetos no Brasil' Discussion Paper 02/2013 - Grupo de Economia da Energia
<http://www.gee.ie.ufrj.br/index.php/component/cck/?task=download&file=textos_discussao_arquivo&id=452> 3.

⁴¹⁴ Christopher Garman and Robert Johnston, 'Petróleo: o Brasil no contexto de um panorama global em transformacao' in Fabio Giambiagi (ed), *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier 2013) 265.

⁴¹⁵ This is one among several of the objectives. Another important goal in creating regulatory agencies is to foster competition.

reflects the degree to which the executive, the legislature, or both, seek to bind their hands in order to acquire credibility”.⁴¹⁶ Neo-institutionalists, in particular, contend that regulatory frameworks should be sufficiently predictable, stable and protected from governmental and private entities’ interference so as to incentivise investments in institutional settings that naturally tend to be risky and prone to political pressures.⁴¹⁷

This rationale has certainly been present in the Brazilian oil sector. As discussed in chapter 3, the Brazilian literature recognises that one of the main goals for the creation of regulatory agencies in the country was to provide a reliable and unequivocal commitment to investors that politics would not interfere with regulated business sectors. This is commonly referred to as the “Credible Commitment Hypothesis”.⁴¹⁸ As argued in Part I of the thesis, the 1995 Brazilian regulatory framework has been successful in this respect. In the author’s interviews for this thesis, all of the thirty-four interviewees concurred with this point.

This encouraging scenario, however, will inevitably change. There are several elements in the 2010 Brazilian regulatory framework that will discourage investments in the oil industry. The following sections will examine each one of them sequentially. First, however, the analysis will turn to the main factors that affect investments in the oil sector.

6.1 INVESTMENTS IN THE OIL SECTOR

There is extensive economic intellectual production on investment decisions and their main determinants. The intention here is not to traverse this vast literature. This section will focus specifically on the studies that analyse the main factors influencing investment decisions in the oil sector.

⁴¹⁶ Paulo Correa and others, ‘Regulatory governance in Brazilian infrastructure industries’ (2008) 48 *The Quarterly Review of Economics and Finance* 202.

⁴¹⁷ Mariana Batista Batista, ‘Mensurando A Independência Das Agências Regulatórias Brasileiras’ (2011) *Planejamento e Políticas Públicas* 213

⁴¹⁸ Mariana Mota Prado, ‘Implementing independent regulatory agencies in Brazil: The contrasting experiences in the electricity and telecommunications sectors’ (2012) 6 *Regulation & Governance* 300.

6.1.1 INSTITUTIONAL ENVIRONMENT AND INVESTMENTS IN THE BRAZILIAN OIL SECTOR

As previously stated, neo-institutional scholars consider that certainty, predictability and the existence of independent institutions managing public functions that directly affect corporate yield return are essential factors to foster investments in utility and strategic industries. Based on this overall understanding, several emerging countries have been engaged in institutional reforms of these sectors from the 1990's onwards. The reforms normally included the privatisation of state-owned companies, the enactment of new legal regulatory frameworks, the creation of independent regulatory agencies and competition advocacy.

One would therefore normally expect the Brazilian oil industry, as a regulated industry, to exhibit these same features and institutional attributes. Yet Lourdes Casanova et al present arguments against this standpoint and the neo-institutional theoretical underpinnings. Based on a case study in the Brazilian oil sector and interviews with high-ranking executives and top-ranking specialists in government agencies and trade associations, they argue that corporate strategic decisions are not affected by institutional factors in the oil sector.⁴¹⁹ According to them: "the premises of Hitt & Dacin (2000) and North (2009), according to whom the institutional differences between countries influence firms' strategies, do not apply to the oil industry."⁴²⁰

When explaining their conclusion, Casanova et al contend that the oil industry is globalised and contingent on several geopolitical factors. The urge to replace reserves and the paramount required investments in that endeavour force firms to perform internationally and to consider all risk elements and opportunities around the world. Within this setting, institutional considerations are deemed less important. They particularly allude to the fact that most oil and gas reserves are located in countries with low levels of institutional development

⁴¹⁹ Luiz Marcelo Martins Almeida, Luiz Alberto Nascimento Campos filho and Lourdes Casanova, 'The Brazilian Institutional Environment: The Impact on Companies' Strategies in the Oil and Gas Sector' (2011) Faculty and Research Working Paper - INSEAD.

⁴²⁰ Ibid., 27,28.

in the Middle East and they still receive considerable investments from international oil companies.⁴²¹

Several other studies, however, present different views. As discussed in chapter 4, when comparing National Oil Companies (NOCs) to privately owned International Oil Companies (IOCs), Hartley and Medlock show econometric evidence pointing out that the former are less revenue efficient than the latter.⁴²² The authors mainly give institutional justifications for the disparity. They claim that NOCs tend to overemploy at higher wages and to sell oil products to consumers at subsidised prices. These practices considerably affect their efficiency and are derived from the need to rally political support from a broad constituency. Shleifer and Vishny, similarly, resort to institutional considerations to explain state-owned enterprises' pricing policies.⁴²³ These practices range from pricing below marginal cost (predatory pricing), to gain political support, to the formation of monopoly, for extracting additional rent.

Other studies also take into account how corporate and institutional settings affect oil companies' strategies and performances. Paul Stevens and the Baker Institute of Policy allude to NOCs' conflicting objectives between commercial and non-commercial goals and how this divergence can affect their operational results.⁴²⁴ Victor, Hults and Thurber, in turn, provide a thorough study of 15 of the most important NOCs around the world, attempting to understand the main reason for variations in their performances and strategies. Among the conclusions presented, two are particularly important for this discussion.⁴²⁵ First, NOCs perform worse than IOCs and the most relevant determinant for achievement among NOCs are the goals that governments establish for them. Secondly, the consistency and convergence of the relationships between NOCs and their respective governments are also relevant explanatory performance

⁴²¹ Ibid.

⁴²² Stacy L Eller, Peter R Hartley and Kenneth B Medlock, 'Empirical evidence on the operational efficiency of National Oil Companies' (2011) 40 *Empirical Economics* 623.

⁴²³ Andrei Shleifer and Robert W Vishny, 'Politicians and firms' (1994) *The Quarterly Journal of Economics* 995.

⁴²⁴ Paul Stevens, 'National oil companies: good or bad?' National oil companies workshop: Current roles and future prospects <<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.197.8929&rep=rep1&type=pdf>> accessed 13 May 2014.

⁴²⁵ David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011).

factors. NOCs in countries with unstable and erratic links with their governments perform worse, according to the authors. These are again examples of institutional factors directly affecting companies' performance and strategies.

It is true that these studies are primarily dealing with NOCs, which are normally more sensitive to institutional changes compared to IOCs, since they are at least partially, or entirely state-owned companies and therefore prone to closer ties with the government and more susceptible to political modifications. Yet NOCs are unequivocally important players in the industry and relevant actors in most national institutional governance settings. It is quite improbable that any institutional context with relevant consequences on NOCs would not at least indirectly affect IOCs' performance and strategies.⁴²⁶

Rather than downplaying the importance of institutional factors such as Casanova et al, the interviews for the thesis reveal that they are one among many of the factors to take into account when considering investing in a certain country. Since the risks of operating in the upstream of the oil industry are significant, the relevance of institutional risks tends to be diluted and less apparent if compared to others. Most interviewees for this thesis pointed out that geological risks are predominant in oil companies' investment decisions. They all stressed, however, that institutional risks were always taken into account and stated that Brazil is considered quite developed in institutional terms, especially if compared to other places around the globe that hold significant oil reserves.⁴²⁷

The opinion of Mauro de Andrade is relevant here. In an interview with the author he claimed that a general assumption about Brazil's institutional advantages, if compared to other oil producing countries, ought to be nuanced and considered with care, on a case-by-case basis, considering also the specific applicable conditions to the oil sector.⁴²⁸ He gave the example of two African countries to illustrate his point: Nigeria and Angola. One would argue, at first

⁴²⁶ Ibid.

⁴²⁷ The same conclusion is reached by Luiz Marcelo Martins Almeida, Luiz Alberto Nascimento Campos filho and Lourdes Casanova, 'The Brazilian Institutional Environment: The Impact on Companies' Strategies in the Oil and Gas Sector' (2011) Faculty and Research Working Paper - INSEAD.

⁴²⁸ Interview with Mauro de Andrade, Vice-President of Statoil (Rio de Janeiro, 08 August 2013).

glance, that Brazil would hold a significant institutional advantage over both countries in terms of general investment destination. When analysing the oil sector, however, the conclusion would be that while a great preference exists comparing Brazil to Nigeria in this respect, the same isn't true with regards to Angola. According to him, this latter country confers a relatively stable and predictable environment for oil companies, despite its overall institutional deficiencies.

His view is actually similar to Patrick Heller's analysis, which demonstrates that the government in Angola has been successful in creating a very investor friendly and attractive environment for oil companies, overcoming some of the major institutional setbacks in the country.⁴²⁹ Patrick Heller claims that one of the most important reasons for this accomplishment is the close existing ties between the National Oil Company and its group of well-prepared technocrats with the ruling elite, which grants autonomy for the company to conduct its daily operational business, oriented by commercial strategies.⁴³⁰ Even though rent seeking exists in the country, the government has not allowed it to affect the composition of the NOC's (Sonangol) technocratic staff and its main corporate decisions.⁴³¹

6.1.2 MACRO INSTITUTIONAL AND MICRO INSTITUTIONAL ASPECTS

Statoil's Vice-President's statements and Patrick Heller's study are very careful to identify two types of institutional settings, both of which affect companies' strategies and performance, in line with the institutional theoretical framework. The first one, at the macro institutional stage, applies at the aggregate level of institutions, taking into account, primarily, country risk, political stability and macro governance interplay. The second, at the micro institutional level, is principally concerned with the conditions that affect a specific industry, the applicable contracts, market structure, its competitive determinants, regulations and

⁴²⁹ Patrick Heller, 'Angola's Sonangol: Dexterous Right Hand of the State' in Victor, Hults and Thurber (eds), *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2012).

⁴³⁰ Ibid.

⁴³¹ Of course such policy might have a socially detrimental impact on the country which were not specifically taken into account in Patrick Heller's analysis.

governance mechanisms among sectorial agencies. Of course these two levels interact to a certain degree and are affected by one another.

The first type of analysis at the macro level is mainly based on the studies of North,⁴³² while the second primarily takes into account Williamson's perspective.⁴³³ Williamson also extends the analytical framework to reach individuals of specific organisations. Institutional influences would therefore apply in different layers, according to the diverse analytical dimensions, exerting influence on one another. Scott, in turn, distinguishes these two approaches as the followers of historical institutionalism, in the first camp, and rational choice theorists, in the second.⁴³⁴ While historical institutionalists are basically concerned with the macro perspective, identifying evolutionary aspects of institutions and how they affect individual preferences, rational choice scholars take these individual choices as givens and examine how institutions are formed to solve collective action dilemmas resulting from individual predilections. While preferences for the first group are endogenous, influenced and formed by historical contexts, for the second theorists they are exogenous and predefined.

Casanova et al's analysis does not appear to distinguish between these two dimensions of institutional risks, focusing, instead, only on the macro perspective. This partially explains their conclusion about corporate strategic decisions not being affected by institutional factors. While macro institutional elements may not play a relevant role for corporate strategies in Brazil, as suggested by the authors, at the micro level the situation is most certainly different.

It is symptomatic that despite reaching the conclusion that institutional differences between countries do not apply to the oil industry, Casanova et al. state that:

“all the respondents drawn from the E&P industry and two of those from government organizations (together 6/16 of the sample) stated that the ending

⁴³² Douglass C North, *Institutions, institutional change and economic performance* (Cambridge university press 1990).

⁴³³ Oliver E Williamson, 'Hierarchies, markets and power in the economy: an economic perspective' (1995) 4 *Industrial and Corporate Change* 21 cited in Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 36.

⁴³⁴ W Richard Scott, *Institutions and organizations* (Sage 2001).

of the upstream monopoly in 1997 and the creation of the National Petroleum Agency and clear rules were the main factors for the increased investment in the sector.”⁴³⁵

These legal oil sector changes are a clear example of micro institutional factors influencing corporate decisions in the Brazilian oil sector.

In the interviews conducted for this thesis, all the interviewees questioned about institutional and regulatory risk for investments in the country, with the exception of Statoil’s Vice-President, perceived it to mean macro institutional risk.⁴³⁶ Only after further enquiries and explanations did they express their considerations about micro perspectives. Since Casanova et al’s interviews were conducted via questionnaires, it is quite possible that they did not manage to carefully explain or detail the difference between macro and micro institutional settings to their interviewees.

Furthermore, as previously mentioned, the oil industry is considerably globalised. One of the reasons for this international dimension is exactly the need to diversify investment portfolios to reduce risk, as also noticed by Casanova et al.,⁴³⁷ Felipe,⁴³⁸ Thurber and Hults⁴³⁹ and all interviewees for this thesis working in exploration areas. Because of these strategies, the industry has become less vulnerable to institutional risks. This does not mean, however, that they are not important. It just means that the strategy undertaken by oil companies has progressively reduced these risks quite effectively over time. Lourdes et al.’s static analysis, based on a single case study in a country considered macro institutionally stable, such as Brazil, missed this point. This inaccuracy could have been avoided in a dynamic and wider enquiry

⁴³⁵ Luiz Marcelo Martins Almeida, Luiz Alberto Nascimento Campos filho and Lourdes Casanova, ‘The Brazilian Institutional Environment: The Impact on Companies’ Strategies in the Oil and Gas Sector’ (2011) Faculty and Research Working Paper - INSEAD.

⁴³⁶ Not all interviewees were asked about this question, since some of them were specialised in other areas and did not hold knowledge in this specific topic.

⁴³⁷ Luiz Marcelo Martins Almeida, Luiz Alberto Nascimento Campos filho and Lourdes Casanova, ‘The Brazilian Institutional Environment: The Impact on Companies’ Strategies in the Oil and Gas Sector’ (2011) Faculty and Research Working Paper - INSEAD.

⁴³⁸ Ednilson Silva Felipe, ‘Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)’ (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 27.

⁴³⁹ Mark Thurber and David R Hults, ‘Management & Strategy-Risk Attitudes Shape National Oil Company Strategies’ (2012) World Oil 97.

about institutional aspects that have historically influenced corporate strategies in several countries' oil sectors.

It is useful to allude here to Ednilson Felipe's work, which also clearly recognises how institutional elements have shaped Petrobras' strategies in Brazil in different periods.⁴⁴⁰ He examines how the company has strategically adapted since its foundation, in 1953, taking into account the divergent views of its stakeholders. Based on the findings of Alveal,⁴⁴¹ Felipe shows that despite this flexibility, Petrobras has been able to create a long-term strategic corporate project, which has been consistently followed in a very rational manner. He stresses the importance of the company's versatility when confronted with different institutional settings and how it has been able to adapt successfully at different moments, exerting political pressure and influence on critical occasions. Felipe resorts to Williamson,⁴⁴² Spiller and Liao⁴⁴³ to illustrate that firms are not only influenced by institutional settings in a passive and reactive manner, but they also tend to pro-actively attempt to change the environment to their own best interests.

Guilherme Dias opposes Felipe's viewpoint, claiming that the government's influence over Petrobras, as main shareholder, has been the main performance and strategic determinant, rather than the firm's ability to implement a corporate long-term strategic project.⁴⁴⁴ He therefore rejects the view that the company's success in implementing corporate strategies was the main reason for its performance results, since these internal factors mainly depend on the government's decision, as main shareholder.

⁴⁴⁰ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010).

⁴⁴¹ Edelmira del Carmen Alveal Contreras, *Os desbravadores: a Petrobrás ea construção do Brasil industrial* (Relume Dumará 1993).

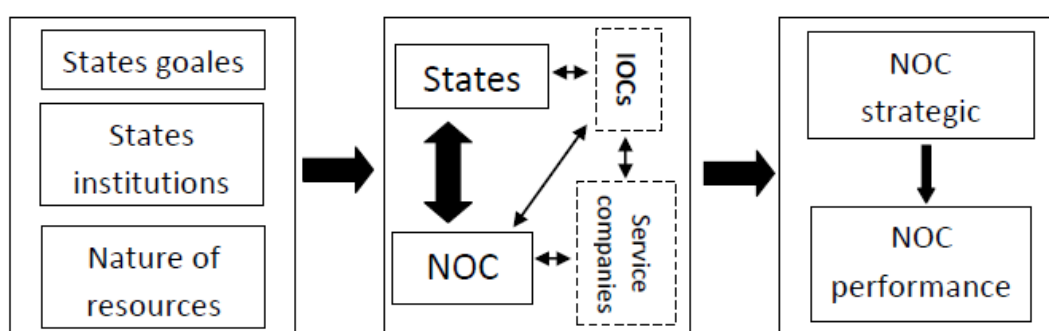
⁴⁴² Oliver E Williamson, 'Hierarchies, markets and power in the economy: an economic perspective' (1995) 4 *Industrial and Corporate Change* 21, cited in Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 36.

⁴⁴³ Pablo T Spiller and Sanny Liao, 'Buy, Lobby or Sue: Interest Groups' Participation in Policy Making-A Selective Survey' (2006) referred in Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 17.

⁴⁴⁴ Guilherme Gomes Dias, 'Mudança Institucional e Desenvolvimento: O Caso da Indústria do Petróleo no Brasil' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013).

A more balanced position would attempt to avoid this excessive polarisation between the influence of a corporate technocracy and the government, as the respective understandings of Felipe and Dias. It would be more realistic to consider, instead, several vectors of influence on Petrobras' performance and strategy coming internally from the company and also from the government. Even these vectors, however, have their own subdivisions, since the government and the company cannot be envisaged as a whole unified, homogeneous and coherent entity. A quite comprehensive explanatory model to examine strategy and performance in the oil sector is presented by Victor et al. in the figure below.⁴⁴⁵

Figure 1: Institutional model in the Oil Sector



Source: Victor DG, Hults DR and Thurber MC, Oil and governance: state-owned enterprises and the world energy supply (Cambridge University Press 2011), 888.

According to Victor et al's diagram, state goals, state institutions and the nature of resources, in the left hand box, directly impact on the format of a country's oil sector and its main governance mechanisms between the NOC, IOCs, the government and service companies, contained in the middle box. The interplay between these actors will, in turn, define the companies' strategic choices and their performance, in the box at the right. In other words, governance mechanisms between main sectorial players influence and determine oil companies' strategies and performances.

⁴⁴⁵ Victor DG, Hults DR and Thurber MC, Oil and governance: state-owned enterprises and the world energy supply (Cambridge University Press 2011), 888.

In contrast to this more comprehensive analytical framework, Felipe's position focuses excessively on the firm, while Guilherme Dias' focuses on the government, as if it were totally separated from the company, when actually it is not. Besides, the fact that the government is Petrobras' main shareholder and has the final word in corporate decisions does not mean that it cannot be influenced by the company's employees and its specific ethos and corporate culture, which could be perfectly reflected on a rational corporate plan, as argued by Felipe.

What is important to take into account at this point, however, is that institutional factors are important elements in an oil company's strategy and performance. Since decisions about investments are an essential component of any company's strategy and performance, investments are particularly reactive to institutional settings.

The following sections will now consider the aspects in the 2010 Brazilian regulatory framework that will affect investment decisions in the Brazilian oil sector. The first element to be analysed in section 6.2 are the governance mechanisms among the existent entities in the oil sector. Section 6.3 will then turn to Petrobras' operational exclusivity. Finally, section 6.5 will examine the positive aspects of the regulatory framework.

6.2 GOVERNANCE MECHANISMS IN THE BRAZILIAN OIL SECTOR

The Brazilian oil industry's main institutions and their respective competences have already been described in chapter 2. This section will analyse the interplay among these entities, their formal and informal institutional relationships and interconnections and how they are likely to affect investment decisions in the sector.

The regulatory framework established from 1995 to 2010 had some basic features that led to a transparent, predictable and balanced governance setting, with effective controlling mechanisms between the different component entities. The Brazilian institutional design during that period provided for functional separation between the regulatory, policy formulation and operational roles, which were assigned to different entities accordingly. This functional demarcation between distinct bodies had the advantage of permitting institutional checks and

balances between them and provided greater assurance that policies would be implemented without undue governmental and private parties' interference.

The Legislative branch was responsible for approving laws that would guide policy formulation in the sector and the allocated budget for its implementation. The ministries of the Executive branch held planning and formulation functions, while the regulatory agency, ANP, would be responsible for sectorial regulation, monitoring and oversight, maintaining independence from governmental and corporate influence. Petrobras held operational functions jointly with other private oil companies, which were all overseen by ANP. These roles, in turn, were subject to legislative control and monitoring, tasks performed by this branch with the support of the Federal Government's National Accounting Tribunal (TCU). Whenever cases of normative infringement were detected they could be brought to courts, which would therefore perform the essential normative and legal oversight functions.

This structure worked very much in accordance with the Norwegian oil sector's framework, as discussed in chapter 4, and has been recognised by specialists for its suitability in terms of institutional design.⁴⁴⁶ In spite of the cited advantages of the legally defined institutional governance framework, one should argue whether it actually worked in practice. Laws and regulations can be very rationally envisioned and designed but their actual effectiveness presupposes adequate implementation and enforcement procedures.⁴⁴⁷ Otherwise they can become "like a beautiful musical instrument that is rarely played", a problem quite frequent in Latin American countries.⁴⁴⁸ With this goal in mind, the governance interplay among institutions will be analysed in the following sections starting first with the landscape before the 2010 modifications and moving then to the governance setting after that year.

⁴⁴⁶ Cf. Nadeja M Victor, 'On measuring the performance of national oil companies (NOCs)' (Program on Energy and Sustainable Development: Working Paper # 64, 2007); David R. Hults, Mark C. Thurber and David G. Victor, *Oil and governance : state-owned enterprises and the world energy supply* (Cambridge University Press 2012); Luiz Cezar Quintans(ed), *Contratos de Petroleo Concessao e Partilha Propostas e Leis para o Pre-Sal* (B. Biz Editores 2011); and Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011).

⁴⁴⁷ Paulo Correa and others, 'Regulatory governance in Brazilian infrastructure industries' (2008) 48 *The Quarterly Review of Economics and Finance* 202.

⁴⁴⁸ Jorge Guira, *Mercosur*, vol 18 (Kluwer Law International 2003) 8.

In spite of the 2010 regulatory modifications, the basic institutional setting of the Brazilian oil sector was established in the 90's, with the 1995 constitutional amendment and the enactment of Law 9,478. Hence, the 2010 regulatory framework reform did not revoke or annul the previous one, but has rather modified it, maintaining its basic institutions.

Any legal modification establishing new roles, competences and functions among regulatory entities inevitably brings uncertainty to the business environment that can potentially affect investment decisions. Yet there are certain elements of the 2010 reform that raise even greater concerns beyond the mere apprehension about institutional change. There are governance aspects established in the new 2010 provisions that impact negatively on investments because of the very nature of the stipulated conditions, the content of their provisions and how they effectively come into force. The aim of this section is to take these elements into account, examining their repercussions.

Within this overall setting, the governance interplay among institutions will be analysed in four stages in the following sections. The first will take into account the interaction between the Executive branch and ANP. The second will analyse the interplay between ANP and Petrobras and the third between the Executive branch and Petrobras. The final section will examine PPSA's interface with all other relevant entities of the oil sector. Even though these interactions seem at first glance to ignore the relationships with the Legislative and Judicial branches, that does not happen since the analysis takes into account the influence of laws on the current governance setting, considering also their enforcement and litigation aspects.

6.2.1 INTERFACE BETWEEN THE EXECUTIVE BRANCH AND ANP

The analysis in chapter 2 discussed that one of the problems of the Brazilian Regulatory Framework from 1995 to 2003 was ANP's tendency to engage in formulation and planning functions, at the expense of the Ministry of Mines and Energy (MME) and the National Council of Energy Policy (CNPE). This is one first aspect to be considered as a dysfunctional application of the legally established governance model in Brazil. One of the shortcomings of this setting is that regulatory agencies are ideally not supposed to perform these functions because they lack

legitimacy. They have not been democratically elected for these roles. Regulatory agencies are required to act with independence from governmental and private parties' interference, implementing, monitoring and overseeing the policies designed by the Executive branch. There are two possible shortcomings that can arise from regulatory agencies performing planning functions, as in the case just described.

The first is the formulation of excessively technocratic sectorial policies, disconnected from stakeholders' needs and demands, for lack of linkages and communication channels with these groups and with politicians and ministries of the Executive branch, which have legitimate mandates to represent them. The second, in a diametrically different scenario, arises in situations of excessively high levels of interconnection between stakeholders and the regulatory agency. Such agents in this case actually intensify their clout within the agency, mitigating the previously mentioned problem, but causing, instead, a significant reduction of its autonomy, potentially leading to capture and corruption.

The dichotomy between these two extreme positions is one of the main quandaries of regulation theory.⁴⁴⁹ It actually poses a significant dilemma to policy makers, since the very instruments that mitigate stakeholders' lack of participation are the same ones that might lead to capture and corruption.⁴⁵⁰ Tackling this dilemma therefore presupposes considering how to promote collaborative and legitimate regulatory policies closely connected to stakeholders, avoiding at the same time the risk of capture and corruption.

Ayres and Braithwaite contend that one of the ways to mitigate this problem is by empowering "public interest groups".⁴⁵¹ The authors advocate that this is an essential step for a "responsive regulation", blending state and private regulations and encouraging collaboration between the different stakeholders.⁴⁵²

⁴⁴⁹ Ian Ayres and John Braithwaite, *Responsive regulation: transcending the deregulation debate* (Oxford University Press 1992).

⁴⁵⁰ Ibid.

⁴⁵¹ See discussions in Section 3.4.1.

⁴⁵² Ian Ayres and John Braithwaite, *Responsive regulation: transcending the deregulation debate* (Oxford University Press 1992).

Even though in Brazil there hasn't been any initiative of empowerment of public interest groups along the lines proposed by Ayres and Braithwaite towards "Responsive Regulation", there have been signs that from 1995 to 2003 ANP has been quite successful in avoiding the two problems cited above. Several scholars and specialists deem this agency to have suffered more political interference than others, yet capture and political subordination of ANP are not mentioned as a problem in Brazil. Edmar Luiz Fagundes de Almeida is of the opinion that ANP has the necessary autonomy to perform its functions.⁴⁵³ Other specialists in the field share the same view.⁴⁵⁴ Furthermore, in spite of the need to increase the engagement levels of certain stakeholders within the agency, such as consumers, for example, the interconnection between ANP and the oil industry is intense and relatively straightforward, since Petrobras is the dominant player in the country in all production stages and has facilitated access to the regulator.⁴⁵⁵

Given that the two-abovementioned problems of ANP's formulation policy proactivity between 1995 and 2003 have been avoided in Brazil, how has this fact specifically affected investment decisions in the Brazilian oil sector? The influence has been quite minimal. The vast majority of scholars and specialists consider the Brazilian regulatory framework to have been successful in attracting investment to this sector.⁴⁵⁶ All the interviewees for this thesis concurred in this point. Lourdes Casanova et al reach the same conclusion in interviews with

⁴⁵³ Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013) 135,137.

⁴⁵⁴ Cf. Interview with Olavo Bentes David, Deputy Attorney General of the National Petroleum Agency (ANP) (Rio de Janeiro, 24 July 2013); and Mariana Batista Batista, 'Mensurando A Independência Das Agências Regulatórias Brasileiras' (2011) Planejamento e Políticas Públicas 213.

⁴⁵⁵ This does not mean that the relationship between ANP and Petrobras does not have conflicts, as the next sections will show.

⁴⁵⁶ Cf. Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); Adilson De Oliveira, 'Oil and governance: state-owned enterprises and the world energy supply' in David Victor, David Hults and Thurber (eds), *Oil and Governance* (Cambridge University Press 2012); Walter De Vito and Richard Hochstetler, 'Perspectivas para os investimentos petrolíferos no Brasil' in Giambiagi and Velloso Lucas (eds), *Petróleo-Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2012); Luiz Paulo Velloso Lucas, 'A derrota de um modelo de sucesso' in Giambiagi (ed), *Petróleo-Reforma e Contrarreforma do setor petrolífero brasileiro* (Elsevier 2012); Oxford Analytica, 'The Impact of Pre-Salt: A Long-Term Perspective' (A Report Prepared for PETROBRAS, 2010).

high-ranking executives and specialists in government agencies and trade associations of the Brazilian oil sector.⁴⁵⁷

The next immediate question that arises then is why hasn't ANP's proactivity in policy planning functions affected investment decisions? That could have been expected, since the agency had been deviating from its essentially regulatory functions, which could have led to uncertainty and a higher risk of political interference.

Three responses can be pointed out. The first and most immediate one is that ANP has actually acquired the credentials of a trustworthy and technically competent entity. As stated by Olavo Bentes David, ANP's Deputy Attorney General, in an interview with the author: "Brazil has today two institutions of technical excellence operating in the oil sector: Petrobras and ANP."⁴⁵⁸

The second reason is an immediate consequence of the first. Because of ANP's high technical standards, expertise and professionalism it has been able to adequately incorporate main policy functions among its tasks in a very impartial and proficient manner, safeguarding it from political interests that do not take into account the ultimate development of the Brazilian oil sector. In other words, the policy functions incorporated in ANP's agenda have been performed in coherence with the main statutory goals of the Brazilian oil policy. When ANP for example changed the public tender proceedings to insert local content clauses, in principle an action within the policy design realm, the main goal was to foster the Brazilian local industry and not to favour some specific political interest group.⁴⁵⁹ This objective of developing the national industry of suppliers is clearly stated in Law 9,478. Several scholars claim that ANP assumed policy formulation functions because it was actually better prepared to perform these

⁴⁵⁷ Luiz Marcelo Martins Almeida, Luiz Alberto Nascimento Campos filho and Lourdes Casanova, 'The Brazilian Institutional Environment: The Impact on Companies' Strategies in the Oil and Gas Sector' (2011) Faculty and Research Working Paper - INSEAD.

⁴⁵⁸ Interview with Olavo Bentes David, Deputy Attorney General of the National Petroleum Agency (ANP) (Rio de Janeiro, 24 July 2013).

⁴⁵⁹ Local content policies are policies that favour the acquisition of national goods by requiring that a certain percentage of the company's purchase should be made in Brazil. This topic will be further explored in the next chapters.

functions than the Ministry of Mines and Energy and CNPE. They posit that ANP simply filled a functional lacuna because of the urge to undertake these activities.⁴⁶⁰

The third explanation is that oil investors envisage Brazil as an institutionally developed country, with a credible and dynamic oil sector, where rules tend to be followed, contracts are adequately enforced and the risks of nationalisations are slim. These advantages are intensified taking into account the comparison with other places around the globe that offer investment prospects in the same area. In other words, the opportunity cost of investing in the Brazilian oil sector is not significant because compared to other oil producing countries in the world it is considered an attractive place in terms of institutional and regulatory risks.

From 2003 onwards, when the government of President Lula took office, ANP's engagement in formulation and planning functions was halted.⁴⁶¹ President Lula made several speeches after his inauguration in January 2003 against the excessive powers granted to regulatory agencies during President Cardoso's term. In one of his public statements he referred to regulatory agencies as an "outsourcing of the country's management".⁴⁶² Yet what started as a fierce opposition was progressively mitigated in the following months. This oscillation might have resulted from an internal division within the government, especially between the Civil House and Ministry of Finance. While the former was more critical about those entities' excessive proactivity, the latter revealed a rather lenient approach towards them, fearing the negative consequences of an increasing governmental interference in this area.⁴⁶³

In spite of these alternations, since 2003 the Ministry of Mines and Energy (MME) has been better equipped, with the establishment of specific careers, an increase in its budget and

⁴⁶⁰ Cf. Bernardo Mueller and Carlos Pereira, 'Credibility and the design of regulatory agencies in Brazil' (2002) 22 Brazilian Journal of Political Economy 65; Helder Queiroz Pinto Jr, 'Institutional Designs and Regulatory Reforms in the Energy Industries' (2004) 2 Oil, Gas & Energy Law Journal (OGEL); and Edson Nunes and others, *Agências reguladoras e reforma do Estado no Brasil: inovação e continuidade no sistema político-institucional* (Garamond Universitária 2007).

⁴⁶¹ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010).

⁴⁶² Edson Nunes and others, *Agências reguladoras e reforma do Estado no Brasil: inovação e continuidade no sistema político-institucional* (Garamond Universitária 2007) 255

⁴⁶³ Ibid. 258.

the creation of the Secretariat of Petroleum and Gas.⁴⁶⁴ This Secretariat was created to bolster planning functions in the areas of oil and gas in the Ministry, which had been hitherto excessively focused on the electrical segment. According to Felipe, MME actually started taking over, with these actions, the policy planning space that had been formerly occupied by ANP.⁴⁶⁵ This new stance became evident in 2004 with the sixth bidding round, when MME changed ANP's decision with respect to the offered blocks in the public tender. The episode affected the Agency's image and actually reaffirmed Lula's government's intention to leave essential planning and formulation functions with institutions directly linked to the Presidency such as MME and CNPE. Felipe claims that it represented an inflection point in ANP's former proactive stance at the expense of MME and CNPE.⁴⁶⁶

In another illustrative case, President Lula actively interfered in the agencies' financial autonomy when he vetoed a bill proposal that forbade the federal government to modify their budgetary allocations coming from fees collections.⁴⁶⁷ As already analysed in chapters 3 and 4, the control of regulatory agencies' finances limits their independence. One way of circumventing such limitations is by allowing them to have some degree of financial autonomy through the collection of fees, for example. Yet in Brazil, this financial autonomy is considerably diminished because the President can restrain agencies' financial resources through presidential decrees. The bill proposal that President Lula vetoed was one unsuccessful attempt to solve this problem.

In 2010, the enactment of the three laws that modified the legal framework of the Brazilian oil sector - Law 12,351, Law 12,304 and Law 12,276 - consolidated the tendency inaugurated since 2003 of revamping policy formulation and planning functions of entities directly linked to the President. While it is laudable to transfer functions essentially related to policy formulation from ANP to entities directly linked to the President, such as MME and CNPE,

⁴⁶⁴ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 107.

⁴⁶⁵ Ibid.

⁴⁶⁶ Ibid.

⁴⁶⁷ Ibid. 107.

there is also a risk that the agency's diminished political clout might reduce its regulatory capacity, impacting on its effectiveness. This topic is analysed throughout the next sections.

6.2.2 INTERFACE BETWEEN THE EXECUTIVE BRANCH AND PETROBRAS

The analysis here can be subdivided in two periods: from 1995 to 2003 and from that year onwards. While in the first term there has been a tendency of declining governmental influence in Petrobras, the trend shifts in the second period and its influence progressively increases.

During the first period, the government was particularly concerned in creating the appropriate conditions for Petrobras to be able to compete with private oil companies. This naturally involved reducing its influence in the company, a stricter adherence to corporate commercial objectives and the establishment of profound managerial modifications in the corporation. Dias argues that these changes were fundamental for the company's positive results in the following years. According to him, they were the natural corollaries of all the modifications in the oil regulatory framework launched with the 1995 Constitutional amendment, allowing for private oil companies to explore oil in Brazil, and followed by the enactment of Law 9,478.⁴⁶⁸

Dias places emphasis on normative changes, especially legal ones, as the main performance catalysers, while Felipe, in contrast, argues for the importance of Petrobras' corporate adaptability whenever confronted with different institutional settings, as a core explanatory variable for the company's positive performance from 1995 to 2010.⁴⁶⁹ Dias, for example, cites the importance of Decree 2,745 for Petrobras to contract services and purchase goods and the provisions in Law 9,478, which allowed it to form joint ventures without Congress' prior approval, as main performance boosters. Felipe, in turn, stresses Petrobras'

⁴⁶⁸ Guilherme Gomes Dias, 'Mudança Institucional e Desenvolvimento: O Caso da Indústria do Petróleo no Brasil' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013).

⁴⁶⁹ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010).

corporate culture, its adaptability and effectiveness in exerting political pressure to the firm's best interest as the main determinants of the positive corporate outcomes.

The antagonism between these viewpoints seems again to arise from an excessively polarised and exclusionary analytical stance between internal and external corporate factors impacting on Petrobras. While Dias takes into account institutional influences at the aggregate level, based on the studies of Douglass North, Felipe concentrates on the micro institutional realm, taking into account Williamson's understanding that firms pro-actively endeavour to change institutional settings to their own advantage.⁴⁷⁰

These standpoints need not be in opposition however. They actually complement each other and are variations of the same institutional theoretical framework. Yet one limitation in both models is that they equally tend to consider their basic analytical units, the government and Petrobras, as homogeneous, uniform and coherent entities, without acknowledging their important subdivisions and factions. This shortcoming becomes evident when both authors analyse the possibility of Petrobras' privatisation in the first years of President Cardoso's term, in the early 90s. While Felipe attributes the decision not to privatise the company to Petrobras' influence on public policies,⁴⁷¹ Dias argues for the government's perception that the privatisation of a monopolised sector would just transfer the monopoly to private hands.⁴⁷² The debate on Petrobras' privatisation involved several actors and vectors of influence in the government and in Petrobras. Therefore, it seems reductionist to attribute the decision of not privatising the company to one unique preponderant factor, as the two authors tend to do.

In spite of these considerations, the normative changes alluded to by Dias and Petrobras' corporate culture and managerial transformations, described by Felipe, both led the company to

⁴⁷⁰ Oliver E Williamson, 'Hierarchies, markets and power in the economy: an economic perspective' (1995) 4 *Industrial and Corporate Change* 21, referred to in Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 36.

⁴⁷¹ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 72.

⁴⁷² Guilherme Gomes Dias, 'Mudança Institucional e Desenvolvimento: O Caso da Indústria do Petróleo no Brasil' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013) 130.

progressively adopt features of a standard private oil company, with the incorporation of performance indicators, tradable shares and corporate governance standards and a consequent decrease of the government's influence over it. As discussed in chapter 4, several national oil companies such as Statoil, Aramco and CNOOC have incorporated corporate efficiency standards and performance benchmarks similar to private oil companies. The practices include the creation of independent corporate boards of directors to improve transparency, accountability and performance standards and also IPOs, partial privatisations and commercial bonds issuance. These initiatives tend to improve public reporting, transparency, accounting and corporate governance standards. Moreover, they bring increasing international financial scrutiny to the firm, improving the incentives for efficiency.⁴⁷³

In 2003, with the inauguration of President Lula, the situation changes. Petrobras starts to be increasingly used as an instrument of public policy implementation and the government's influence on the firm escalates accordingly. This tendency became quite evident when Bolivia nationalised Petrobras' gas installations in the country, in 2006. Even though the company intensified the pressure on the government of Bolivia for fair compensation, President Lula adopted a conciliatory negotiating posture, considering the Brazilian foreign policy interests of South-American integration as a priority not to be put at risk. This appeasing stance acted against Petrobras' interests.⁴⁷⁴

Petrobras also progressively regains the policy formulation functions that it used to have before 1995, when it had exclusivity for exploring oil in Brazil.⁴⁷⁵ Edmar Luiz Fagundes de Almeida in an interview on 5 November 2012 with Francisco Ebeling Barros explicitly mentions that strategic oil policy decisions in Brazil are taken "almost directly by Petrobras".⁴⁷⁶ One of the

⁴⁷³ Cf. Section 4.1.1.

⁴⁷⁴ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 181.

⁴⁷⁵ Interview with Edmar Luiz Fagundes de Almeida in Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013) 135-137.

⁴⁷⁶ Personal translation from: *ibid.*

consequences of the increasing use of the company for public policy purposes is its progressive politicisation, due to the importance it assumes within the government.

As analysed in chapter 4, international governance literature emphasises national oil companies' (NOC) tendency to get involved with politics, sometimes taking advantage of governments to their own benefit.⁴⁷⁷ Some NOCs actually become so powerful that they are often referred to as a "state within a state".⁴⁷⁸ This excessive influence can be dangerous, especially if NOCs assume planning functions at the expense of other bodies of the executive and legislative branches, which may enjoy a more legitimate democratic basis.

In the Brazilian case, Petrobras' excessive influence on public policy design is even more troublesome. Differently from most countries, where NOCs are fully state-owned enterprises and normally linked to the Executive branch, Petrobras is a mixed state company regulated by private laws, with significant private capital and without any formal connection to the governmental structure.⁴⁷⁹ Since the Brazilian national oil company has historically assumed planning and formulation functions in the Brazilian oil sector, one faces the bizarre situation whereby private investors could potentially have been performing typical governmental tasks.

Of course, the government is still the company's controlling shareholder with majority decision-making power and, therefore, private capital's influence on final decisions is naturally nuanced and considered by governmental board representatives before being approved. Yet according to corporate governance principles and corporate laws, minority shareholders hold fundamental rights that guarantee them a reasonable voice and adequate deliberation channels within their companies. Besides, according to these same norms, all shareholders must vote in accordance with the corporation's interests, which, in turn, should never damage minority

⁴⁷⁷ Paul Stevens, 'National oil companies: good or bad?' National oil companies workshop: Current roles and future prospects
<<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.197.8929&rep=rep1&type=pdf>> accessed 13 May 2014.

⁴⁷⁸ Ibid. 10.

⁴⁷⁹ Petrobras is a state controlled company whose governmental shares amount to 55,6 % of the voting shares. Petrobras' website <<http://www.petrobras.com.br/rs2009/pt/relatorio-de-sustentabilidade/apresentacao-forma-de-gestao-e-transparencia/perfil/estrutura-societaria/>> accessed on 5 May 2013.

shareholder's interests. Article 115 of Law 6,404, which regulates corporations and joint stock companies in Brazil, specifically provides that:

"The shareholder shall exercise the right to vote in the corporation's interest; the right to vote shall be deemed abusive if it is exercised with the intent to cause damage to the corporation or to other shareholders, or of obtaining an advantage for the shareholder or for a third party to which neither is entitled, and which results or may result in damage to the corporation or to other shareholders."⁴⁸⁰

It is therefore problematic from a corporate governance perspective for a corporation such as Petrobras, which has as one of its duties the protection of corporate interests,⁴⁸¹ to exert typical governmental functions. It becomes even more troublesome if these tasks involve policy design and planning roles that affect important sectors of the Brazilian economy, as is the case with the oil industry here considered.

As discussed in chapter 3, one of the most studied topics in regulation is the problem of capture, also referred to as "capture theory" in the literature, which claims that industries tend to control the regulator to their own best interests.⁴⁸² In the case of Petrobras' tendency to exert planning and policy design functions for the oil sector, the situation is arguably worse for it is deciding about essential policy issues that go beyond regulatory aspects. Policymaking can actually shape the very format of regulation. Several specialists consider that not even regulatory agencies should be involved in formulation and planning functions, which, because of their importance, should be exclusively restricted to entities that are part of the direct executive and legislative branches.⁴⁸³

⁴⁸⁰ Law no. 6.404 of December 15, 1976, translation prepared by CVM available at: <http://www.cvm.gov.br/ingl/regu/Law6404r.ASP>.

⁴⁸¹ Article 1 of Petrobras' Bylaws.

⁴⁸² See discussions in section 3.2.4.

⁴⁸³ Cf. Organisation de coopération et de développement économiques (OECD), 'Brazil strengthening governance for growth' (2008); and Edson Nunes and others, *Agências reguladoras e reforma do Estado no Brasil: inovação e continuidade no sistema político-institucional* (Garamond Universitária 2007).

The government's increasing sway in Petrobras from 2003 onwards is also reflected in Petrobras' pricing policies. As previously analysed, the maintenance of downstream prices below international levels to tame inflation reduces Petrobras' profitability and is one of the main causes of the company's share drop until 2013.⁴⁸⁴ Corporate governance problems within Petrobras are the main reason behind this dysfunctional and distortive pricing policy.

Another area where similar situations of conflict of interest can arise within Petrobras' Board is taxes. The Ministry of Finance is responsible for tax collection in Brazil and has been carefully engaged from 1994 onwards in maintaining a consistent primary surplus. Since Petrobras is the main oil company operating in Brazil it obviously suffers most of the tax burden in the sector. Within this setting, Petrobras' Board members from the Ministry of Finance could be tempted to favour projects that lead to a higher tax collection in their deliberations, instead of prioritising Petrobras' corporate strategies.⁴⁸⁵

The government's influence over Petrobras is one of the most serious governance issues in the Brazilian oil sector for investment purposes. The negative effects of the Brazilian NOC's pricing policies, which have already considerably affected its share prices and finances, are an important source of concern for investors and Petrobras' minority shareholders.⁴⁸⁶ The minority shareholder representative, Silvio Sinedino, mentioned in an interview that he would fight for "a more independent Petrobras from the government" and explicitly pointed to the pricing policy by saying that "the government cannot kill its 'Goose that lays golden eggs'".⁴⁸⁷

⁴⁸⁴ Cf. Ana Siqueira, 'O que aconteceu com a Petrobras?' in Giambiagi (ed), *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro Rio de Janeiro: Elsevier* (Elsevier 2013) and also section 6.5.

⁴⁸⁵ A similar situation of conflict of interest exists in Mexico, with its national oil company PEMEX, where Hacienda, the Mexican Ministry of Finances, holds a seat on the board. Ognen Stojanovski shows that Hacienda's main concern about PEMEX is whether it is respecting its annual budget and therefore ignores other main relevant strategic variables such as the use of the most effective technology or if it has a coherent and well-elaborated long-term expansion plan. Cf. Ognen Stojanovski, 'Handcuffed: an assessment of Pemex's performance and strategy' in *Oil and Governance State-owned Enterprises and the World Energy Supply* (2012) 296, 297.

⁴⁸⁶ Ana Siqueira, 'O que aconteceu com a Petrobras?' in Giambiagi (ed), *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro Rio de Janeiro: Elsevier* (Elsevier 2013).

⁴⁸⁷ Personal translation from: Marta Nogueira, 'Funcionário eleito para conselho defende Petrobras independente' *Valor Econômico* (Rio de Janeiro).

6.2.3 INTERFACE BETWEEN ANP AND PETROBRAS

The interconnections between ANP and Petrobras can also be divided into two periods: from the agency's creation, in 1997, until 2003, and from that year onwards. The first period was a time in which the government of President Fernando Henrique Cardoso established the regulatory agencies, with the main goal of ensuring that potential investors would be granted the necessary autonomy and would have a professional, specialised and qualified staff.

Competition emulation was a main aspect of the Brazilian regulatory reforms of that time, a period that comprised a wider economic and socio-political project of democratisation, political and economic liberalisation and decentralisation of social networks.⁴⁸⁸ Competition concerns were particularly troublesome in the oil sector because they required curbing Petrobras' influence in the sector and also diminishing the government's sway in the company. This initiative would evidently involve political costs, since the corporation was efficient, productive, profitable and had been a constant source of pride for Brazilians throughout its history.⁴⁸⁹

Therefore, ANP's initial challenge was to form a structure capable of regulating and monitoring Petrobras, the powerful Brazilian national oil company, which had held a monopoly until 1995.⁴⁹⁰ David Zylberstajn, the first Director General of ANP, in a statement to the newspaper "Folha de Sao Paulo" illustrates such concern: "The national oil company will be treated just like any other company that operates in the sector".⁴⁹¹

Brazil faced the same challenge as Norway in the 1970s, with the creation of its regulatory agency, the Norwegian Petroleum Directorate (NPD). One of NPD's main hindrances to institutional recognition was its difficulty in forming a specialised and technically qualified

⁴⁸⁸ Fernando Henrique Cardoso and Mariana Magalhaes, 'Democracy as a starting point' (2001) 12 *Journal of Democracy* 5,14.

⁴⁸⁹ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010).

⁴⁹⁰ Ibid.

⁴⁹¹ Personal translation from Folha de São Paulo. 18 de janeiro de 1998, cited in *ibid.*, 110.

staff. Another difficulty was to obtain all the relevant technical information from Statoil and from the Ministry of Petroleum and Energy (MPE) to perform its functions.⁴⁹²

Similarly, in Brazil, one of ANP's main concerns in fostering a competitive environment in the sector was to have access to important data and reduce the information asymmetries between itself and Petrobras, on the one side, and amongst the national oil company and all other potential entrant oil corporations, on the other. Utility and energy industries quite frequently reveal information asymmetries between regulator and regulated entities.⁴⁹³ The latter holds significantly more information about the sector, while the former is supposed to use this exact same information to exert its regulatory activities, controlling and monitoring it. The problem is worse in transitional industries, with a former monopolistic structure, as in Brazil.⁴⁹⁴ Two challenges arise in these cases. First, to promote a cooperative stance between regulator and regulated entities, ensuring that all relevant information will be provided to the regulator while avoiding, at the same time, the problem of "capture".⁴⁹⁵ Second, to maintain competitive conditions in the market, in spite of the previous monopolist's natural advantage, compared to potential competing firms. According to Peter Cameron⁴⁹⁶ and Daniela Couto,⁴⁹⁷ the joint establishment of antitrust and regulatory policies in the most coordinated and harmonised way as possible is an essential step in these transitional industries.

This initial phase of ANP's consolidation as a credible regulatory agency also coincided with a posture of decreasing governmental influence in Petrobras and of reducing clout of this

⁴⁹² See discussions in chapter 4.

⁴⁹³ Cf. Helder Q Pinto Jr and Melissa Cristina Pinto Pires, 'Assimetria de informações e problemas regulatórios' (Agência Nacional do Petróleo, Nota Técnica, 2000); Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010); Daniela Couto Martins (2013); Peter D Cameron, *Competition in energy markets: law and regulation in the European Union* (Oxford University Press 2002).

⁴⁹⁴ Prior to 1995 Petrobras was the only company authorised to hold activities in the Brazilian upstream oil sector.

⁴⁹⁵ Daniela Couto Martins, *A Regulação da Indústria do Petróleo: segundo o modelo constitucional brasileiro* (Fórum 2013).

⁴⁹⁶ Peter D Cameron, *Competition in energy markets: law and regulation in the European Union* (Oxford University Press 2002) 3, 35.

⁴⁹⁷ Daniela Couto Martins, *A Regulação da Indústria do Petróleo: segundo o modelo constitucional brasileiro* (Fórum 2013) 101, 143.

company, in turn, in the Brazilian oil sector as a whole.⁴⁹⁸ From 1997 to 2002, the Federal government's participation in Petrobras was progressively reduced. Despite still maintaining voting power control, with more than 50% of voting shares,⁴⁹⁹ it passed from 51.5% to 32.6% in that period.⁵⁰⁰ Other actions were taken to bring Petrobras closer to a joint stock company such as: enactment of new by-laws, establishment of corporate governance guidelines, best practice codes and the approval of normative frameworks for the Board of Directors and its Committees.⁵⁰¹

Several initiatives were similarly undertaken to “level the playing field” between Petrobras and potential entrant companies in two different ways. First, through actions to ease access to prospective competitors in the Brazilian market. Second, by carefully tailoring Petrobras to its new functions as a competitor of other private firms.

Actions in the first domain include the provisions of Law 9,478 related to the sharing of information about the Brazilian basins. Within this setting, article 22, § 1 of Law 9,478 required Petrobras to share with ANP all its data on Brazilian sedimentary basins and all other activities of research, exploitation and production of oil developed during the period of its exclusive operation in the oil sector (before 1995). Article 8, XII, in turn, provided that ANP should annually convey and divulge data about the national natural gas and petroleum reserves in Brazil. Finally, article 65 of Law 9,478 required Petrobras to constitute subsidiary corporate entities to build and operate its ducts, maritime terminals and vessels for oil transportation. The provision sought to facilitate market access to entrant companies by ensuring that they would contract these services with a subsidiary company, which did not compete with them in the

⁴⁹⁸ Ednilson Silva Felipe, ‘Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)’ (Dphil thesis, Universidade Federal do Rio de Janeiro 2010).

⁴⁹⁹ Brazilian shares are subdivided into ordinary shares and preferential shares. The former give the owner voting rights while the latter do not. The government in this period just referred maintained a majority of ordinary shares, which gave it voting control.

⁵⁰⁰ Ednilson Silva Felipe, ‘Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)’ (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 135.

⁵⁰¹ Ibid. 133.

same market.⁵⁰² This partitioning of activities also reduces the incentives for firms to engage in cross subsidies, in which excessive profits in one area, where it faces less competition, can leverage lower prices in other markets, where competition is higher. Such practices tend to occur in vertically integrated market industries, where each level of the supply chain faces different competition conditions.⁵⁰³

The initiatives in the second field aimed at giving more managerial and financial autonomy and flexibility to Petrobras so it could compete with private firms without having to comply with excessively bureaucratic rules and proceedings.⁵⁰⁴ Two changes were particularly relevant in this area. The first was the possibility of contracting services and buying products using a special statute with simplified proceedings, Decree 2,745, without having to comply with Law 8,666. Law 8,666 applies to all Brazilian state entities for contracting services and buying products. It establishes a set of detailed rules and proceedings to be followed that sometimes can lead to excessive bureaucracy and, eventually, to delays. Even though the Federal Government's National Accounting Tribunal (TCU) has legally questioned Petrobras' use of Decree 2,745 instead of Law 8,666, the decisions at the Supreme Court have been favourable to the Decree's validity.⁵⁰⁵ The second change was the possibility granted in Law 9,478 for Petrobras to form joint ventures with private international companies without the requirement of Congress' prior approval.⁵⁰⁶ This modification proved essential for Petrobras to negotiate its strategic alliances with other companies, avoiding the risk of political interference or of lengthy deliberations.

⁵⁰² Daniela Couto Martins, *A Regulação da Indústria do Petróleo: segundo o modelo constitucional brasileiro* (Fórum 2013) 188.

⁵⁰³ Cf. Robert Baldwin, Martin Cave and Martin Lodge, *Understanding regulation : theory, strategy, and practice* (2nd ed. / Robert Baldwin, Martin Cave, Martin Lodge. edn, Oxford University Press 2012); and Daniela Couto Martins, *A Regulação da Indústria do Petróleo: segundo o modelo constitucional brasileiro* (Fórum 2013).

⁵⁰⁴ Guilherme Gomes Dias, 'Mudança Institucional e Desenvolvimento: O Caso da Indústria do Petróleo no Brasil' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013), 133.

⁵⁰⁵ Cf. Petrobras v Tribunal de Contas da Uniao MS28744; Petrobras v Tribunal de Contas da Uniao MS-ED 25986; Petrobras v Tribunal de Contas da Uniao MS-MC 26783; Petrobras v Tribunal de Contas da Uniao MS 27232; Petrobras v Tribunal de Contas da Uniao MS 29326. All available at: <http://www.stf.jus.br/portal/jurisprudencia/pesquisarJurisprudencia.asp> accessed 22 May 2015.

⁵⁰⁶ Guilherme Gomes Dias, 'Mudança Institucional e Desenvolvimento: O Caso da Indústria do Petróleo no Brasil' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013) 136.

The increasing political clout granted to ANP until 2003 and Petrobras' declining influence within the government and in public policy formulation did not influence, however, specific legal disputes between these entities. Felipe shows that Petrobras has always succeeded whenever its interests have clashed with ANP's in this period.⁵⁰⁷ The disputes between these two entities were more intense in the natural gas sector, where Petrobras did not hold a dominant position and ANP had the goal of establishing competitive conditions upfront, avoiding any risk of one single firm's future dominance.⁵⁰⁸ Sebastiao do Rego Barros, ANP's Director-General, in a statement when leaving office in 2005 is illustrative of the concern about Petrobras' political influence: "The doubt about Petrobras' role – is it a company or is it the government? – is one of the factors that hinders the establishment of competitive conditions in the Brazilian oil sector".⁵⁰⁹

From the year 2003 onwards, ANP's influence is progressively diminished and its roles gradually questioned by the incumbent government. Petrobras' influence, in turn, is considerably revamped.⁵¹⁰ Another legal dispute between these two entities happened at the moment of the eighth bidding round in 2007. On that occasion, one of the clauses inserted in the public tender, known as the "competitive clause", imposed a maximum number of blocks that each company could win. Because of its dominant position in Brazil and its historical prevalence in bidding offers, Petrobras was particularly affected by this provision. Felipe even considers that Petrobras was actually the specific target of the "competitive clause".⁵¹¹ The bidding round was suspended because of a court order that considered it to be anticompetitive. ANP appealed to the Supreme Court, which decided the case in its favour. Despite this result, the bidding

⁵⁰⁷ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 110,112.

⁵⁰⁸ Ibid.

⁵⁰⁹ Personal translation from O Estado de São Paulo, 'A Petrobrás é empresa ou é governo?' *O Estado de São Paulo* (15 January 2005) cited in Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 112.

⁵¹⁰ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 26.

⁵¹¹ Ibid. 112.

round was annulled afterwards because of the discovery of the pre-salt oil deposits in 2008 and the government's priority in analysing the convenience of changing the regulatory framework.

Petrobras' escalating political clout, its increasing use as a policy formulator and implementer, together with ANP's reducing influence, can have negative repercussions for companies investing in the Brazilian oil sector and also in those considering investing in Petrobras, or even forming joint ventures with the company. The signal that this setting can send to potential investors is that the regulator has fewer conditions to control the company, which holds an undeniable dominant position in areas governed by concession contracts and exclusive operational rights in regions under production-sharing contracts, established in Law 12,351. The situation is worsened given that the disputes between the two entities have been frequently resolved favourably to Petrobras, as discussed by Felipe.⁵¹² The regulator's decreasing influence is also particularly problematic in view of the agency problems analysed in the next section and the significant information asymmetries that exist in the Brazilian oil sector, which might signal to regulated companies that the regulatory agency is losing the capacity to impose effective sanctions for deviant firms. Ayres and Braithwaite mention that:

“What may predict cooperative, compliant outcomes is whether regulatory agencies are perceived by industry as benign big guns. That is, if the agency is perceived as cooperative even though it may be quite adversarial; if it is perceived as willing and able to repay uncooperativeness with awesome sanctioning even though it is not, then firms will cooperate and comply.”⁵¹³

Yet it is relevant here to clearly differentiate between ANP's decreasing political influence and interaction with the government from its regulatory capacity. While it is essentially valid to keep regulatory agencies away from policy formulation functions and political influence, guaranteeing their independence, it is equally important to ensure that they have the adequate tools and mechanisms in place to provide for effective regulation and

⁵¹² Ibid. 110,112.

⁵¹³ Ian Ayres and John Braithwaite, *Responsive regulation : transcending the deregulation debate* (Oxford University Press 1992) 45.

enforcement procedures. To use Ayres and Braithwaite's metaphor they should have "benign big guns".⁵¹⁴ This separation between political influence and regulatory capacity represents a great challenge to regulatory agencies since these two dimensions are frequently linked. There are signs, from what was described above, that ANP's loss of political influence within the government has also led to a decrease in its regulatory capacity towards Petrobras, the industry's main player. Sergio Abranches, for example, considers that Petrobras still holds significant regulatory power in Brazil, which explains why investor companies entering the Brazilian market tend to form joint ventures with the company instead of competing with it.⁵¹⁵

Because of Petrobras' importance and MME's and CNPE's historical lack of political clout in the sector, especially until 2003, the most important interplay to be analysed in the Brazilian oil industry is actually between ANP and Petrobras. Normally regulatory agencies are created to be shielded against capture and political influence. Capture usually occurs whenever the agency takes its decisions guided by the interest of regulated parties, while the political influence situation arises whenever the agency strictly follows the political convenience of the government. As paradoxical as it might seem, in the Brazilian institutional setting these two problems of capture and political influence sometimes tend to be transferred to the relationship of ANP with Petrobras. In other words, since Petrobras is a state-controlled company with significant powers in the sector and the entities of the Executive branch are rather weak, it is quite natural for the government's influence over ANP to come not directly from the Ministries or entities from the Executive, as normally occurs in text book theoretical models, but directly from Petrobras. Furthermore, since this company holds a significant dominant position in almost all stages of the production chain, it also presents the highest risks of capturing the regulatory agency. Within this setting, governance problems that tend to occur in the interplay among regulatory institutions such as capture and political interference have also a tendency to be internalised within Petrobras' corporate structure. This is why it is essential to consider, in our specific case, not just the governance institutional structure of the Brazilian oil sector, but

⁵¹⁴ Ibid. See discussions in Section 3.4.

⁵¹⁵ Edson Nunes and others, *Agências reguladoras e reforma do Estado no Brasil: inovação e continuidade no sistema político-institucional* (Garamond Universitária 2007) 206.

also Petrobras' actual corporate governance setting, to where several institutional disputes tend to be transferred.

The interactions between ANP and Petrobras are expected to significantly increase in the future, in view of the escalating activities in which the national oil company is engaged in, because of the size of the discovered pre-salt deposits and the company's operational exclusivity in the area. The 2010 legal changes significantly increase Petrobras' importance, placing it as an essential tool of public policy implementation, while reducing, in turn, ANP's roles, especially at the policy planning level. The essential question to be answered is whether the changes will reduce ANP's actual regulatory capacity. The most problematic issue in this respect are the information asymmetries between ANP and Petrobras. If they were already considerable before the 2010 reforms, they can be significantly worsened by the operational exclusivity because the Brazilian national oil company will face less scrutiny coming from other oil companies, which could contribute to curbing this informational imbalance, bringing important aspects to ANP's knowledge.

If the past disputes between these two entities, as previously described, mostly favoured Petrobras, a recent case, however, had a different outcome, actually showing that ANP seems resolved to effectively perform its regulatory activities, even resorting to litigation, if necessary. In an administrative decision against Petrobras, Petrogal and BG, ANP refused to grant them permission to divide the block of Lula in two smaller ones: Lula and Cernambi. By splitting the block in two, the companies would avoid paying the Special Participation tax, which is levied on high volumes of production, according to Decree N. 2.705. The group initiated arbitration proceedings at the International Chamber of Commerce (ICC), questioning ANP's decision, but the agency filed a case in court seeking the annulment of ICC's jurisdiction over the issue. The Federal Judge of Rio de Janeiro, Raffaele Pirro, decided the case favourably to ANP and ordered the suspension of the proceedings.⁵¹⁶ Even though the case will probably be appealed, it shows

⁵¹⁶ Marta Nogueira, 'Petrobras Sofre Nova Derrota contra ANP' *Valor Economico* (12 May 2014) <<http://www.valor.com.br/empresas/3543764/petrobras-sofre-nova-derrota-contra-anp#ixzz31VerBrEF>> accessed 28 May 2014.

ANP's determination in effectively pursuing its regulatory function, even if it means confronting powerful groups, litigating against them.

Another issue to take into account is that by presenting the case to the International Chamber of Commerce, Petrobras seems to have followed its commercial goals, leaving aside one of the Ministry of Finance's priorities, which is tax collection, as already mentioned as one of the areas where corporate governance problems come into play.

In another area where corporate governance issues are particularly troublesome - pricing policies - there has been no compromise after the 2010 reforms between the conflicting interests of the Ministry of Finances, Guido Mantega, and the company's CEO, Gracas Foster, who supported an immediate oil price increase bringing it closer to international levels. While the appointment of Gracas Foster to the position of CEO gave some hope to investors as to a change in pricing policies, since she was close to the President and seemed determined to perform this task, recent developments showed that she has been unsuccessful.⁵¹⁷ Gracas Foster had been advocating the establishment of a clear formula to calculate downstream oil prices, which would gradually bring them closer to international levels, aiming at solving the previously mentioned distortions. Yet the Minister of Finance fiercely resisted pricing practices similar to international levels and the use of any publicly available formula.⁵¹⁸ Gracas Foster's resolve in changing this situation seemed evident when she started publicising the internal division inside the company in this respect to the press. After a series of news reports covering this clash, in a meeting of the Board on 29 November 2013, the position of the Ministry of Finance prevailed.⁵¹⁹

⁵¹⁷ Denise Luna, 'Namoro do mercado com Graça esmorece' *Folha de São Paulo* (Rio de Janeiro) <<http://www1.folha.uol.com.br/mercado/2014/01/1392236-namoro-do-mercado-com-graca-esmorece.shtml>> accessed 28 May 2014.

⁵¹⁸ Cláudia Schüffner, 'Mantega 'vence' Graça no reajuste da gasolina' *Valor Econômico* (Rio de Janeiro) <<http://www.valor.com.br/brasil/3358736/mantega-vence-graca-no-reajuste-da-gasolina#ixzz2mM95wFdk>> accessed 12 May 2014.

⁵¹⁹ The international oil price slump in the second half of 2014 inverted the situation, since national oil prices were maintained at their same levels and remained above foreign levels for the first months of 2015.

6.2.4 INTERFACE BETWEEN PPSA AND ENTITIES OF THE BRAZILIAN OIL SECTOR

As already described in chapter two, Law 12,304 authorised the Executive branch to create Pre-Sal Petroleo S.A. (PPSA), a wholly state-owned enterprise responsible for monitoring the production-sharing contracts in pre-salt layers and areas deemed strategic. PPSA was officially created in 2013, by Decree 8,063, which detailed furthermore its competences.

The creation of this new entity in the Brazilian oil industry and the shift in roles of the existing ones, as previously mentioned, inevitably adds elements of uncertainty to the institutional governance structure in the sector.⁵²⁰ One first aspect that has been worrying potential investors, is, therefore, the unpredictability with respect to PPSA.⁵²¹ This uncertainty about such an important agent within the new regulatory framework inevitably adds risk to companies considering driving their capital to Brazilian pre-salt ventures. The following aspects related to the entity's functions add even further concerns for future investments in the country's oil sector.

6.2.4.1 PPSA'S PRESENCE IN OPERATIONAL COMMITTEES

PPSA has significant relevance in operational committees, which should be formed by all winning consortia operating in pre-salt layers and areas deemed strategic.⁵²² The most important decisions of Consortia operating in blocks auctioned under Law 12,351 will have to be submitted to the Operational Committee, which will represent the interests of all companies in the winning consortium of a certain block in pre-salt and strategic areas. Yet 50% of the committee's votes belong to PPSA, which will therefore have the final say in all important operational decisions, even though it is not required to contribute capital of any kind.⁵²³ It will also indicate the Committee's President, who will hold the prerogative of qualified voting.⁵²⁴ Petrobras, in turn, which is the exclusive operator in the region, will have at least a 30% voting

⁵²⁰ Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013).

⁵²¹ Cf. Interview with Joao de Lucca, President of the Brazilian Petroleum Institute (IBP) (Rio de Janeiro, 05 August 2013); Interview with Armando Guedes, Former President of Petrobras (Rio de Janeiro, 21 July 2012); Interview with Mauro de Andrade, Vice-President of Statoil (Rio de Janeiro, 08 August 2013).

⁵²² Article 19 of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

⁵²³ Article 23, sole paragraph of *ibid.*

⁵²⁴ *Ibid.*

share, since this is the minimum required percentage for its participation in pre-salt and strategic domains, according to Law 10,351.

This situation creates two kinds of agency problems: one between the operator (Petrobras) and members of the operational committee⁵²⁵ and another one between the effective agents in the case, with a final say on most important decisions, PPSA, and all investors (Petrobras included), the principals on this specific occasion.

The first agency problem takes place because Petrobras as exclusive operator in pre-salt and strategic regions will be acting on the consortium's behalf. Companies considering investing in Brazilian pre-salt layers will be more reluctant to do so if they don't have the possibility to act in operational activities.⁵²⁶ Of course it is always positive to have Petrobras as a partner, operating in an area where it has significant know-how and experience. However, this company's exclusive mandatory operation will most certainly prove detrimental to another firm's investment decisions because of the difficulty to have access to relevant information coming from the daily routine of the activities.⁵²⁷

Petrobras, the agent, will have access to all daily operational activities having a natural incentive to decide all these functional routine issues maximising its own corporate interests, even if at the expense of the consortium, considered the principals in this case. Furthermore, the fact that Petrobras has a high 30% participation at the operational committee will give it significant leverage to use all data knowledge to its own benefit, not necessarily divulging it, not even to PPSA, responsible for monitoring production-sharing contracts. There have been examples in the past, where Petrobras made decisions in its own corporate interests, ignoring environmental determinations because of the impact of the investments on their costs, as demonstrated by Carlos Jacques et al.⁵²⁸

⁵²⁵Carlos Jacques Viera Gomes and others, 'Avaliação da proposta para o marco regulatório do pré sal' (Centro de Estudos da Consultoria do Senado federal Textos para discussão, 2009).

⁵²⁶ Ibid.

⁵²⁷ Ibid.

⁵²⁸ Ibid.

The second agency problem happens because PPSA with its minimum 50% share and appointment of the operational committee's president will be able to deliberate in several situations on the other member's behalf, especially in cases in which the approval quorum is established in low percentages (anything above 50%, for example). This agency situation is very peculiar because normally the agents take decisions having more information than the principals, maximising, as result, their own benefits at the expense of investors. The situation in our case is the opposite, since PPSA holds less information than one of the main investors, Petrobras (with at least 30%), which has extensive knowledge on the Brazilian sedimentary basin and operational exclusivity in pre-salt and strategic regions.

Most principal-agent problems are considerably reduced by diminishing information asymmetries, which normally occur via increased sharing of information from agents to principals. Yet in our case increased sharing is required from principals to agents. What this means is that Petrobras will have a natural incentive to provide all necessary data to PPSA to reduce agency problems that might adversely affect it in PPSA's deliberations. Yet Petrobras does not have any incentive to divulge any other information that would negatively affect other investors in the consortium, especially if the concealment would benefit it, or even PPSA. This wouldn't be necessarily a problem if those other investors' interests were sufficiently aligned with Petrobras' or with PPSA's, because agency dilemmas would be reduced in this case. Yet there is no evidence or indication that this will necessarily happen.

Therefore, while there are elements that lead to the decrease in agency problems between PPSA and Petrobras, nothing guarantees that these same problems between the Brazilian National Oil Company and other investors will have a solution. Petrobras could, for example, perfectly hold back information about the commerciality of a certain pre-salt block because it intends to concentrate efforts on a commercially more attractive location, such as in the areas where it operates according to the onerous relinquishment regime, without paying royalties or Special Participation taxes.⁵²⁹ Such decision could be disastrous for international oil

⁵²⁹ See discussions in previous chapters.

companies acting as investors on the ignored block, while for PPSA's interests and the government it might be more rational to do so, especially in a context of limited resources for capital disbursements.

During the interviews conducted for this thesis, all interviewees not working in governmental institutions⁵³⁰ revealed concerns related to these aspects and how they would affect the attractiveness of the Brazilian pre-salt basin. Flavio Ofugi, Shell's Director of Government Relations and Regulatory Affairs specifically mentioned the uncertainty regarding PPSA's composition, its structural organisation and decision-making process, as issues that hinder an appropriate assessment of the investment risks involved in areas governed by Law 12,351. Joao de Luca, President of the Brazilian Institute of Petroleum, Gas and Biofuels (IBP),⁵³¹ contended, similarly, that PPSA's presence in the operational committee as it stands will certainly deter investors.

Before the enactment of Law 12,351, IBP actually presented its views on the drawbacks of PPSA's excessive powers in operational committees and lack of financial contribution. It claimed that the situation could lead PPSA to take important decisions without duly considering all technical aspects potentially affecting companies in the consortium.⁵³² Statoil's Vice-President and the Superintendent of the National Organisation of the Petroleum Industry (ONIP),⁵³³ Alfredo Renault, also expressed concerns about these aspects in interviews with the author. Alfredo Renault was quite vocal in this respect, referring to it as "utterly senseless, probably only existent in Brazil". Walter De Vitto and Richard Lee Hochstetler refer to PPSA's

⁵³⁰ 12 interviewees out of 34. Some interviewees did not express their opinion about this point because their expertise was in a totally diverse area.

⁵³¹ IBP is an organisation without any political links with the main mission of developing the Brazilian industry of Petroleum, Gas and Biofuels.

⁵³² Luiz Cezar Quintans (ed), *Contratos de Petroleo Concessao e Partilha Propostas e Leis para o Pre-Sal* (B. Biz Editores 2011) 23, 24.

⁵³³ ONIP is a non-governmental organisation which acts as an articulation forum between oil companies, the government and the supplier's oil industry.

preponderance within the governance structure established in operational committee's according to Law 12,351 as the worst aspect of the 2010 oil legal reforms.⁵³⁴

6.2.4.2 PPSA AND CONTRACTUAL LIABILITY

Contractual liability is another area that considerably affects investment decisions because of moral hazard problems. As previously discussed, PPSA does not participate financially in the consortia investing in regions under Law 12,351. Yet it has majority-voting power in the operational committee, indicates its president and is responsible for managing the production-sharing agreements on behalf of the government. PPSA will therefore have decisive voice in the consortium's decisions. However, in spite of these roles and according to Article 8, paragraph 2 of Law 12,351, PPSA it is not legally liable for potential contractual damages affecting operational activities. The provision states that:

“Paragraph 2. The public enterprise mentioned in paragraph 1 of this article shall not undertake the risks and shall not bear the costs derived from the activities of exploration, evaluation, development production and decommissioning of exploration and production installations, arising out of production share contracts.”

Yet the other companies that are part of the consortium can be held liable for damages relating to decisions on which they might not have had the final say, considering PPSA's decision-making power.⁵³⁵ It is therefore evident that this article actually leads to a seriously distortive situation in which those who have majority deliberation power are not liable, while those that lack it face the consequences in their place.

According to economic theory, situations of moral hazard take place when one party engages in risky events because of the existence of a safeguard that protects it from hazards incurred by another party. In these cases, there is a natural incentive for the protected agent to

⁵³⁴ Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013) 309.

⁵³⁵ Eduardo Augusto Guimaraes, 'Uma avaliação da política de conteúdo local na cadeia do petróleo e gás' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013)346.

increasingly engage in riskier activities while the other agent bears the effects of his irresponsible behaviour. In the case here mentioned PPSA has all the incentives not to take the appropriate legal precautions in its contractual relationships with third parties, since it can actually transfer this burden to its partner companies, which are part of the contract.

This serious liability imbalance acts as an evident deterrent to potential investor companies. Moreover, it is contrary to the logic of several public private partnerships around the world, including in Brazil, where the risks of ventures are shared accordingly between the parties to foster investments in risk-prone sectors.

Other questions add further concerns to these already highly contentious issues in the Brazilian oil sector. PPSA will be interacting with a whole set of consolidated institutions such as Petrobras and ANP, with a long history of political links and relationships within the government. Petrobras is particularly known for its significant influence in the sector, close interconnection with high-ranking governmental officials and for even conducting in some instances strategic planning and policy formulation roles, as previously shown.⁵³⁶ The company's predominance in the sector has been significantly enhanced with the inauguration of President Lula and followed thereafter by his party successor, President Dilma.⁵³⁷

Petrobras' historical tendency to exert significant influence on main national oil policies,⁵³⁸ and PPSA's preponderance in operational committee's according to Law 12,351 therefore demand a careful analysis of the interplay between these two companies, which jointly hold at least 80 % of the operational committee's seats.⁵³⁹ In other words, they will together have the vast majority and an effective possibility of deciding everything in this forum, at the expense of minority investors.

⁵³⁶ Felipe ES, 'Mudanças Institucionais E Estratégicas Empresariais: A Trajetória EO Crescimento Da Petrobras a Partir Da Sua Atuação No Novo Ambiente Competitivo (1997-2010)' Rio de Janeiro

⁵³⁷ See chapter 6.

⁵³⁸ Felipe ES, 'Mudanças Institucionais E Estratégicas Empresariais: A Trajetória EO Crescimento Da Petrobras a Partir Da Sua Atuação No Novo Ambiente Competitivo (1997-2010)' Rio de Janeiro.

⁵³⁹ According to Articles 10, III, (c) and 23 of Law 12,351, Petrobras will hold a minimum 30% share of the Operational Committee and PPSA 50%.

6.2.4.3 INTERFACE BETWEEN PPSA AND PETROBRAS

Petrobras is a dominant company in the oil sector, having direct close connections with the Presidency of the Republic and the powerful economic ministries.⁵⁴⁰ It also holds operational exclusivity in pre-salt and strategic areas and some of its current or former staff might actually migrate to the recently created PPSA. Against this backdrop, one should enquire whether this newly created state enterprise will have effective conditions to formulate an independent, grounded and fair position at the Operational Committee taking into account its role as the Federal Union's representative.⁵⁴¹

One inevitable and significant risk that arises in this context, from the viewpoint of investor companies, is Petrobras' possible influence over PPSA in all its deliberations, leading these two companies to undertake common and jointly decided strategies at the Operational Committee. This risk is increased further in view of the previously analysed agency problems. As mentioned, while there are incentives for diminishing agency problems between PPSA and Petrobras, the same does not happen between the Brazilian national oil company and other investors.

It is not difficult to imagine situations in which PPSA's and Petrobras' interests might be aligned at the expense of other consortium investors. Suppose, for example, that international oil companies are considering drilling ten wells in a certain pre-salt area to explore oil that has already been declared commercially viable. As previously explained, these companies have a natural incentive to inflate their costs, since they will be compensated for part of these expenses, which are considered cost oil, according to production-sharing agreements in force in the pre-salt basin. PPSA, as the Federal Union's representative in the consortium, is responsible for surveillance and monitoring of the costs and therefore will tend to oppose increasing expenses. Petrobras, in turn, if guided solely by its corporate interests, would normally tend to be aligned with international oil companies' position. However, since the company is the only

⁵⁴⁰ Felipe ES, 'Mudanças Institucionais E Estratégicas Empresariais: A Trajetória EO Crescimento Da Petrobras a Partir Da Sua Atuação No Novo Ambiente Competitivo (1997-2010)' Rio de Janeiro.

⁵⁴¹ The Union is a legal entity of public Law vested with the Brazilian State's sovereignty. Cf. Alexandre De Moraes, *Direito constitucional* (Editora Atlas 2002) 269.

operator in the vast pre-salt domains, it naturally faces significant opportunity costs in all its ventures in the area. In other words, any decision of drilling one additional well in one particular area of the pre-salt region will have to be carefully considered by the company, because it would reflect on an increasing difficulty in doing so in other areas, in view of the company's severe investment limitations as exclusive operator in a vast domain. Such restrictions are increasingly acute because of the company's current problematic financial situation.

What this means is that Petrobras would reveal a tendency to maintain a rather resistant stance towards increasing and concentrating capital expenditures in one specific area of the pre-salt region, if compared to other companies with investments in just one block. Because of the imperative of maintaining several projects in the pre-salt region and in the condition of exclusive operator facing investment constraints, Petrobras would probably display a tendency to scatter its capital expenses as much as possible among its several projects in the region. This tendency is reinforced by the requirement of submitting to ANP the development and working plans, which both set minimal targets to be fulfilled in each field.⁵⁴² Within this setting, Petrobras and PPSA would both be reluctant to increase capital expenses, most probably to the detriment of other investors acting in only one project in the pre-salt region. In our particular case, both companies could take advantage of their dominance at the operational committee to decide that they will only drill two wells, instead of ten, as initially sought. From the point of view of other oil companies this decision could mean a lower oil production, and, consequently, reduced expected profits. This apparently private loss, moreover, also has a social dimension, since the public will not be enjoying the full benefits of the more efficient outcome.

Another similar situation could easily arise in straddling of petroleum reservoirs, where a single petroleum deposit extends into the production area of another block in the adjacent area. In these cases, Article 33 of Law 12,351, according to the industrial best practices, provides for unitization procedures for oil production to take place. In most unitization

⁵⁴² Article 24, III and IV of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

contracts the parties of the different exploration blocks agree to the best form of joint exploitation of the adjacent area, minimising their costs.⁵⁴³ The contracts will then detail how the oil is to be extracted and how the proceeds are to be divided accordingly between the different parties. Normally it makes more sense to have only one well in these cases, to share the costs and share the profits between the two groups operating in each block. In the situation of two different blocks located within the pre-salt basin, one would have the bizarre circumstance whereby PPSA and Petrobras as main representatives of the two different operational committees would be at the two ends of the negotiating table, representing different consortia. They would then be able to decide an agreement that best fits their interests even if at the expense of a certain group of investor companies on one of the sides of the negotiating table as their partners. Here again is a clear example of an undeniable incentive for the two state companies to coordinate their position at the expense of investor companies.

Of course these examples do not mean that Petrobras and PPSA's tendency in having convergent and aligned interests and in voting similarly at the operational committee would necessarily lead to worse deliberations for the country. The exact opposite might happen in some situations. Beyond these considerations, however, the point to be stressed here is the negative effect that this specific governance setting will have on companies considering investing in areas under Law 12,351. This is an essential aspect to be considered in view of the urge to develop projects in the Brazilian pre-salt basin and Petrobras' limitations to undertake the necessary investments in this vast domain on its own.

6.2.4.4 INTERFACE BETWEEN ANP AND PPSA

Regarding ANPs interaction with PPSA, the issue of a potential influence of the former on the latter raises far fewer risks and concerns from an investment oriented standpoint, since ANP is not part of operational committees formed for oil exploration in the pre-salt basin. One aspect that might raise concerns, however, is the blurred and overlapping competences between these two institutions.

⁵⁴³ Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 127.

As mentioned by Bruno Queiroz Cunha and Delia Rodrigo, this is a problem that affects the Brazilian regulatory regime as a whole.⁵⁴⁴ The situation is aggravated further because of the lack of institutional coordination and leadership on issues related to regulatory governance in Brazil.⁵⁴⁵ In the oil sector, as previously mentioned, there has been some advance in this respect, compared to the situation before the 2010 reforms. There has actually been a clearer functional demarcation among CNPE, the Ministry of Mines and Energy and ANP. Yet the creation of PPSA has not contributed to this enhanced definition of roles, rather complicating it, instead.

Within this frame, the first doubt that arises is whether PPSA can actually be regulated by ANP. Article 7 of Law 9,478 mentions that ANP is the regulatory agency of the oil and gas industry, which, in principle, would comprise PPSA, as a state-owned enterprise operating in this industry. Yet article 17 of Law 12,304, which authorises the creation of PPSA, remains silent with respect to ANP's regulatory roles over this company. The omission contrasts with clear references about the Ministry of Mines and Energy (MME) supervisory roles and the General Comptroller's Office and the Union's General Accounting Tribunal surveillance and oversight functions over PPSA.⁵⁴⁶

Olavo Bentes David, ANP's Deputy Attorney General, in an interview with the author expressed that the dominant view within ANP's Attorney's Office is that the agency has effective powers to regulate PPSA, since it is an entity of the oil industry. According to him the following case could be a practical example of a situation that would require ANP to perform its regulatory tasks over PPSA:

"If PPSA as part of the Operational Committee of a consortium, for example, approves a development plan that ANP deems inconsistent with the industry's best

⁵⁴⁴ Bruno Q Cunha and Delia Rodrigo, 'Regulatory Governance in Brazil: Inconsistent Coordination, Institutional Fragmentation and Halfway Reforms' 4th Biennial Conference of the ECPR Standing Group for Regulatory Governance <I paper dell'Osservatorio>, Osservatorio sull'Analisi di Impatto della Regolazione, www.osservatorioair.it> accessed 20 May 2015.

⁵⁴⁵ Ibid.

⁵⁴⁶ Article 17 of Law 12,304.

practices and norms it will require it to be amended. And if it is not amended the contract can be rescinded.”⁵⁴⁷

He recognised, however, that this position was not unanimous within the government, since some consider that PPSA cannot be regulated by ANP. This confusion could be potentially damaging to investors, since they would not be able to adequately know if a certain deliberation coming from PPSA could be revised by ANP or not, as in the example cited above. This lack of transparency and legal certainty could undermine possible assessments about the attractiveness of investment opportunities in the pre-salt basin.

A second aspect that adds confusion in the competences of these two entities is the enforcement of local content rules. Article 4 (c) of Law 12,304 states that PPSA is responsible for this role but ANP had been holding these functions hitherto.⁵⁴⁸ Some legal experts consider this provision void, since PPSA as a corporation cannot exert typical policing powers, which require Law enforcement, such as in the case of local content rules.⁵⁴⁹

When asked about the blurred and overlapping competences between PPSA and ANP, Olavo Bentes David considered them to be very few and quite minor. He then added that the functional overlaps should not be too problematic from an investor’s perspective, in view of the credibility that ANP has acquired since its inauguration in 1997. ANP’s Deputy Attorney General then added that the market basically considers ANP a trustworthy institution with high levels of transparency, independence, technical expertise and largely guided by meritocratic principles.

Even though Olavo Bentes David’s opinion is technically correct about ANP’s qualities and their positive impact with respect to investors’ perception, it is relevant to eliminate these overlapping legal competences. If these potential legal incompatibilities are not removed there is always the risk that they might be questioned at some moment, causing further uncertainty.

⁵⁴⁷ Interview with Olavo Bentes David, Deputy Attorney General of the National Petroleum Agency (ANP) (Rio de Janeiro, 24 July 2013).

⁵⁴⁸ Local content policies are policies that favour the acquisition of national goods by requiring that a certain percentage of the company’s purchase should be made in Brazil.

⁵⁴⁹ Luiz Cezar Quintans(ed), *Contratos de Petroleo Concessao e Partilha Propostas e Leis para o Pre-Sal* (B. Biz Editores 2011).

The issue related to local content enforcement is more complicated and might reveal significant shortcomings from an investor's perspective. As will be further seen, the development of a national industry of suppliers at the upstream oil sector is a government priority since the enactment of the 2010 oil laws. It is also an area that has been highly contentious and criticised in academia, the industry and even within the government, in a subtler form. It is therefore an intrinsically polemical topic. Because ANP is a regulatory agency, which is supposed to act with autonomy from the government and private parties, it would be better to have this contentious issue under its exclusive responsibility.

One risk that might exist in having PPSA enforcing local content policies is that it might reveal an excessively stringent stance, under the government's influence, since it is a totally state-owned enterprise, the government appoints all its directors and board members and they can be sacked at any moment. The same could happen with Petrobras, which is a state-controlled company, and as the exclusive operator in pre-salt and strategic areas will be the main agent in the implementation of local content policies. Considering that these two state companies jointly hold at least 80% of the Operational Committee and there is an underlying tendency for their strategies to converge in this forum, as previously described, there is a considerable risk that local content purchases might be conducted in a detrimental manner to international oil companies investing in regions governed by Law 12,351.

6.3 PETROBRAS' OPERATIONAL EXCLUSIVITY

Petrobras' operational exclusivity in pre-salt domains and strategic areas is set out in Article 4 of Law 12,351, which reads as follows:

"Article 4. Petrobras shall be the operator of all blocks contracted under the production-sharing regime, being, for this reason, entitled to minimum interest in the consortium provided for in article 20."⁵⁵⁰

⁵⁵⁰ Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

As previously stated, despite not allowing other oil companies to operate in pre-salt and strategic domains, Law 12,351 permits consortia of investors to be formed, as long as Petrobras holds a minimum 30% participation of any group.⁵⁵¹

Petrobras' operational exclusivity is one of the most criticised points of the 2010 regulatory framework and certainly has drawbacks that will affect more than one variable analysed in this thesis. This section will particularly focus on the effect the exclusivity will have on investments.

Before providing this analysis, however, it is important to understand the context in which this operational exclusivity has been enacted, what were the perceptions towards investments at the time and how they have shaped the legal provisions. This study is relevant to more thoroughly assess possible future effects on investments.

6.3.1 THE OPERATIONAL EXCLUSIVITY IN CONTEXT

As discussed in Part I, the opening of the Brazilian oil sector to international investors and the operation of foreign firms occurred between the years of 1995 and 1997. According to Tolmasquim and Pinto Junior the drivers of institutional change in the oil sector can be subdivided into four distinct groups, according to their political, macroeconomic, sectoral and international dimensions.⁵⁵²

Based on this typology, they claim that the overall acceptance of neoliberal ideas in Brazil acted as the main political driver of the 1995-1997 regulatory framework reform. With respect to macroeconomics, they point to the lack of investments in the oil sector as the leading factor for the changes. The authors consider then the low technological standards of the Brazilian oil industry and the depressed oil prices as the sectoral drivers of change. Finally,

⁵⁵¹ Article 10 (c) of *ibid.*

⁵⁵² Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 2.

concerning international aspects, they cite the oil companies' high competition for investments in countries with reserves as the most influential element of the 1995-1997 reform.⁵⁵³

Building on this characterisation, Francisco Barros analyses the drivers of change in the 2010 regulatory reform. He considers the 2000 oil price rise and Petrobras' appropriation of technological improvements in deep-water exploration as the sectoral factors of change.⁵⁵⁴ The favourable conditions for investment in oil production and the project of using the pre-salt area as an essential instrument for socio-economic development are the macroeconomic elements. The global difficulty in the discovery of new oil reserves was the international driver of change, while the predominance of ideas for socio-economic development via state interventionism acted as the political motive for the modification.

This classification is interesting because it sets out the two contrasting realities of the 1995 to 1997 and the 2010 regulatory frameworks. While the first was enacted in a context of low prices, investment urge and political ideologies of less state intervention, the exact opposite factors influenced the enactment of the second regulatory framework.

While in the 1995 regulatory framework there was a compelling need to attract investments because of Petrobras' financial difficulties and the background of state incapacity to undertake them, in view of the large public deficits, the situation in 2010 was considerably better. While the state had been running primary public surpluses for the preceding five years, Petrobras' finances were also comparably superior to the situation in 1995. At the moment of enactment of the 2010 Regulatory Framework, there was an overall optimistic perception about the future of the upstream Brazilian oil industry. The predominant view was that new worldwide massive oil field discoveries were dwindling and that the recently discovered pre-salt deposits were probably one of the last fields of the sort. The discussions over the new

⁵⁵³Ibid., referred in Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013), 91.

⁵⁵⁴ Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013).

framework and its enactment were therefore based on this overall perception that the Brazilian oil sector was undergoing an especially favourable moment.⁵⁵⁵

6.3.2 OPERATIONAL EXCLUSIVITY AND RESOURCE NATIONALISM

Influenced by this setting, the 2010 regulatory framework contained considerable interventionist provisions, which has led some scholars such as Munir Maniruzzaman⁵⁵⁶ and Marilda Rosado de Sá Ribeiro⁵⁵⁷ to question whether Brazil would be resorting, like some neighbouring countries, such as Venezuela, Bolivia and Argentina, to what is labelled in the literature as resource nationalism.⁵⁵⁸ According to Maniruzzaman:

“Resource nationalism has historically proved to be a cyclical phenomenon, and it is not new. In various geopolitical contexts and situations, it has tended to assert the nation state’s sovereign authority over the upstream (and often even downstream) activities of International Oil Companies (“IOCs”) in the petroleum industry. The spectre of resource nationalism has often appeared with resource scarcity (whether manipulated or not) and the consequent increasing energy prices in the world market”⁵⁵⁹

In some countries resource nationalism is radically manifested through unilateral contract modifications or even expropriation of facilities. This phenomenon has been studied in Economics by Raymond Vernon and is known as “obsolescing bargain”.⁵⁶⁰ It consists of the host governments’ increased bargaining power in oil contracts once petroleum is found and

⁵⁵⁵ Cf. Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013); and Francisco Ebeling Barros, ‘A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo’ (Dphil thesis, Universidade Federal do Rio de Janeiro 2013).

⁵⁵⁶ Munir Maniruzzaman, ‘The Issue of Resource Nationalism: Risk Engineering and Dispute Management in the Oil and Gas Industry’ (2009) 5 Texas Journal of Oil, Gas & Energy Law 79.

⁵⁵⁷ Marilda Rosado de Sá Ribeiro, ‘Sovereignty over Natural Resources Investment Law and Expropriation: The case of Bolivia and Brazil☆’ (2009) 2 Journal of world energy law and business 129.

⁵⁵⁸ Munir Maniruzzaman, ‘The Issue of Resource Nationalism: Risk Engineering and Dispute Management in the Oil and Gas Industry’ (2009) 5 Texas Journal of Oil, Gas & Energy Law 79.

⁵⁵⁹ Ibid. 80.

⁵⁶⁰ Raymond Vernon, ‘Sovereignty at Bay: the multinational spread of Us enterprises’ (1971) 13 The International Executive 1.

investments sunk in the development phase. This larger bargaining power explains some governments' radical moves to ascertain increasing dominance over resources.

In other countries movements are subtler and generally take the form of increasing power of National Oil Companies (NOCs) at the expense of International Oil Companies (IOCs), which are restricted in their further access of petroleum reserves. Ross McCracken, summarises this new reality well and how it creates new relationships between NOCs and IOCs: "Squeezed between the twin pressures of resource nationalism and the state-sponsored NOCs of energy-hungry nations, IOCs are being locked out of the easier-to-exploit resources because NOCs can do it themselves, particularly with service companies that have technology to hire".⁵⁶¹

In Brazil, Resource Nationalism took place through increasing governmental interventionism in the oil sector, especially through greater power given to the two state-owned companies operating in the oil sector: Petrobras and PPSA.⁵⁶² Petrobras' growing clout over oil operations derives mainly from the exclusive operational clause in the pre-salt basin and strategic areas. The next sections will examine the impacts of the exclusivity on Petrobras.

6.3.3 HOW THE OPERATIONAL EXCLUSIVITY IMPACTS ON PETROBRAS

Normally exclusive operational rights would be considered an extreme corporate advantage, allowing firms to extract extensive benefits for lack of competition. It will be argued, however, that the operational exclusivity granted to Petrobras through Article 4 of Law 12,351 will have significant drawbacks for the company.

There is substantial evidence that Petrobras is in a difficult financial situation. Part of this is caused by the company's investment levels in the last few years and part is the result of its pricing policies. The company is facing serious financial problems to cope with its existing projects, of which those in pre-salt areas consist a major portion. Petrobras' business plan for

⁵⁶¹ Ross McCracken, 'IOCs, NOCs Facing Off Over Scarcer Resources' <<https://archive.is/R2fSI#selection-885.0-892.0>> accessed 25 May 2015.

⁵⁶² Walter De Vitto and Richard Hochstetler, 'Perspectivas para os investimentos petrolíferos no Brasil' in Giambiagi and Velloso Lucas (eds), *Petróleo-Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2012).

2014 to 2018 announces investments of US\$ 220.6 billion. Exploration and production accounts for US\$ 153.9 billion, with 60% going to the pre-salt region.⁵⁶³

In an event organised by the Brazilian government in 2013 in London for potential investors - Brazil Infrastructure Forum - Petrobras' financial situation was one of the recurrent issues raised by attendees to the panellists. When specifically questioned about the company's difficult financial situation because of excessively high capital expenditures (CAPEX) in view of the necessary disbursements for the pre-salt area, government officials and Petrobras' representatives answered that the situation was temporary and would be reverted in the future.⁵⁶⁴

Yet that has still not happened as of April 2015. Rather the opposite, the corporation's ratings have been downgraded by Moody's precisely because "the company is likely to take longer than previously expected to achieve planned leverage reductions that are needed for a material improvement in its financial profile".⁵⁶⁵ Petrobras' high debts are a serious source of concern. Its level of net debt-ebitda⁵⁶⁶ ratio of 3.05 was particularly worrisome and considered high for the market in October 2013.⁵⁶⁷ On 19 May 2015 the indicator reached the level of 4.22.⁵⁶⁸ The company's lack of short-term earnings actually forces it to raise debt even further to continue its ambitious investment plan.

Petrobras' pricing policy, in turn, is affected by the company's corporate governance problems, as already discussed. Its board of directors has ten members. The government appoints seven representatives. The minority common stock shareholders and the preferred stockholders have one representative each and the decisions are taken according to a simple

⁵⁶³ Cf. Petrobras' website: <http://www.petrobras.com.br/pt/quem-somos/estrategia/plano-de-negocios-e-gestao/> (last visited April 24th 2015); and Amrita Sen and others, 'Brazil's Struggles' Energy Aspects - In Focus <<https://www.energyaspects.com/publications/view/brazils-struggles>> accessed 15 June 2015.

⁵⁶⁴ Magda Chambriard, Marco Antonio Martins de Almeida and Helder Queiroz, 'Brazil Infrastructure Forum' (2013).

⁵⁶⁵ Moody's Investor Services, available at: https://www.moody.com/research/Moodys-downgrades-Petrobras-ratings-to-Ba2-maintains-review-for-downgrade--PR_319021 accessed 24 April 2015.

⁵⁶⁶ Earnings before interests, taxes, depreciation and amortization.

⁵⁶⁷ Cf. Cláudia Schuffner, 'Petrobras busca mecanismo de reajuste depois de trimestre ruim' *Valor Econômico* (28 October 2013) <<http://www.valor.com.br/empresas/3318172/petrobras-busca-mecanismo-de-reajuste-depois-de-trimestre-ruim#ixzz2k4HlRmJL>> accessed 25 May 2015.

⁵⁶⁸ Aline Cury Zampieri, 'Ibovespa cai com pressão de Petrobras, Vale, bancos e siderurgia' *Valor Econômico* <<http://www.valor.com.br/financas/4056272/ibovespa-cai-com-pressao-de-petrobras-vale-bancos-e-siderurgia>> accessed 25 May 2015.

majority.⁵⁶⁹ Petrobras' Board had been constantly postponing its price increases until the second half of 2014, under the influence of their governmental representatives concerned about inflation levels in the country.

National oil prices have, in turn, been persistently below the international level in Brazil until their collapse in the second half of 2014, significantly affecting corporate earnings. Petrobras' downstream sector has accumulated a \$ 26 billion loss from 2011 until 2014.⁵⁷⁰ These low prices have led to an increase in downstream demand. As discussed in previous chapters, Petrobras is a vertically integrated company, having operations from the upstream to the downstream sectors. One of its main bottlenecks is at the refinery level. The company has been therefore required to import more expensive refined oil to sell it internally at a lower price, until last year's oil price plunge. The corporate losses varied according to the international oil price hikes, which meant that despite its oil reserves, Petrobras was negatively affected by oil price increases.

In spite of all these problems, because of the operational exclusivity provisions Petrobras is obliged to participate in all pre-salt basin and strategic areas' ventures, irrespectively of the winning consortium and of its own corporate possibilities. Even if the company does not hold conditions to be operationally responsible for certain activities it will still need to undertake them because it is the only company allowed to do so. The operational exclusivity granted to Petrobras in the vast pre-salt layers therefore restrains its own capabilities of rationally exploring all its investment possibilities and deciding the best options for the company. It limits corporate strategy choices and imposes on only one company the burden of being responsible for all the country's future oil supply coming from the pre-Salt basin, following the government's auction schedule and not its own capabilities and strategies.

Even worse, it opens the possibility for the government to offer a certain block to be auctioned and for a consortium of companies to win it, against Petrobras' interests, forcing the Brazilian NOC to begin operations in spite of its reluctance in doing so. In principle one would

⁵⁶⁹ Article 31, paragraph 4 of Petrobras' By laws, available at Petrobras' website <<http://www.investidorpetrobras.com.br/en/governance/petrobras-by-laws/>> accessed 5 May 2013).

⁵⁷⁰ Amrita Sen and others, 'Brazil's Struggles' Energy Aspects - In Focus <<https://www.energyaspects.com/publications/view/brazils-struggles>> accessed 15 June 2015.

think that this situation is improbable, since any company considering investing in the pre-salt area would have approached Petrobras and thoroughly examined its real capacity in maintaining operations in the region. The government, in turn, would not organise a bidding round without being totally certain that Petrobras will be able to cope with the projects.

Yet some countries such as China are in significant need of oil for their national development projects and have considerable amounts of available funding through their national oil companies for this purpose. It is arguable that one of China's important concerns is to have access to oil reserves in a sufficient amount for the future,⁵⁷¹ rather than examining the detailed operational conditions of their partners, which could always be resolved via additional funding. Of course this reasoning does not apply indefinitely and irrespectively of the company with which China is considering doing business with. Yet Petrobras is already an established company in the world market and certainly wouldn't represent an excessive risk in this sense for Chinese companies considering gaining access to significant oil reserves for their future development plans.⁵⁷²

This gives rise to the risk of the Brazilian government organising an auction according to Law 12,351, without being certain about Petrobras' ability to cope with the resulting operations, since oil companies establishing excessively ambitious commitments and conditions, at the expense of the Brazilian NOC's operational capacities to implement them, could win the tender. It also raises another kind of problem addressed in chapter 8: the state's considerable loss of strategic control over oil policies. In other words, because of the operational exclusivity, one of the essential aspects of oil policy, which is control over the blocks to be auctioned, will probably no longer essentially depend on policy considerations about the desirable and adequate supply of oil to the country. Instead, it will most certainly vary according to Petrobras' actual exploration possibilities, considering that the government will have to take this into account before organising a public tender.

⁵⁷¹ Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013) 312.

⁵⁷² The recent scandals involving Petrobras certainly affected the company's image but, considering the enterprise's history and comparing it with other national oil companies, it is still considered by investors a solid enterprise for investment purposes.

In the interviews conducted for this thesis, all the thirty-four interviewees except for two, who worked at the Ministry of Mines and Energy (MME), expressed concerns about the operational exclusivity. The common view was that Petrobras did not have the operational capacity to solely undertake all the exploration and production activities in the immense pre-salt basin. Joao de Luca, President of the Brazilian Petroleum Institute (IBP), was even more emphatic. According to him: "It's not just Petrobras, no oil company in the world holds conditions to exclusively operate in the gigantic dimensions of the pre-salt basin".⁵⁷³ He argued that the most immediate consequence of the operational exclusivity would be a decrease in the exploration pace in the area.⁵⁷⁴ All the interviewees not working in governmental agencies specifically stated that one of the reasons for the suspension of oil auctions since 2008 was that Petrobras was not yet prepared to begin operations because of its financial problems.

The suspension of oil auctions for five years certainly had negative consequences because oil companies with investments in Brazil started to leave the country and their cost for coming back is higher.⁵⁷⁵ Moreover, from 2008 to 2014, the period of time during which the Brazilian oil bidding rounds have been suspended, the oil market has changed. New discoveries have taken place, new technologies developed (including fossil-fuel replacement) and the use of shale oil and gas has grown steadily until mid 2014. As claimed by Amrita Sen in an interview with the author, "the attractiveness of the Brazilian Pre-Salt area has certainly decreased over this period".⁵⁷⁶

Petrobras' operational exclusivity also explains its international divestment programme, since the company has to concentrate its corporate efforts on the pre-salt basin, raising funds to cope with the heavy investment burdens in the region. Such requirement has led it to abandon international projects that could be commercially attractive.

Therefore, from what was set out above, the operational exclusivity will significantly restrain Petrobras' corporate strategies while also limiting one of the government's essential oil

⁵⁷³ Interview with Joao de Lucca, President of the Brazilian Petroleum Institute (IBP) (Rio de Janeiro, 05 August 2013).

⁵⁷⁴ Ibid.

⁵⁷⁵ Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013) 197.

⁵⁷⁶ Interview with Amrita Sen, Chief Oil Analyst in Energy Aspects (London, 07 February 2014).

policy aspects, which is the plain control over the bidding process.⁵⁷⁷ Far from a blessing, the exclusivity is rather a curse, fettering state and company together to the disadvantage of both. From the perspective of an investor in Petrobras the exclusiveness means the loss of plain and ample control over the definition of the best corporate strategies. It opens, moreover, an avenue for greater governmental influence in the company, which is an aspect always feared by investors.

It is evident that Petrobras needs other partner oil companies to share the burdens of its ambitious investment plans in pre-salt layers. If investment prospects for a firm with financial and governance problems are already risky, the drawbacks of the operational exclusivity increase it furthermore because of the negative impacts on Petrobras.

6.4 POSITIVE ASPECTS OF THE 2010 REFORM IN TERMS OF INVESTMENT

Despite aforementioned problems, there are some elements of the 2010 reform that might have positive consequences for investors.⁵⁷⁸ Three main aspects can be identified.

The first one is the clearer definition of tasks between governmental bodies, with the concentration of policy and formulation functions in entities directly linked to the Presidency (MME and CNPE), leaving typical regulatory functions with the ANP. This clearer demarcation of competence contributes to higher levels of transparency and accountability. It also reduces the chances of one specific entity assuming functions which had not been assigned to it because of legal loopholes or regulatory lacunas.

As previously mentioned, that is what exactly happened in Brazil with ANP, from 1997 until 2003. By ensuring that typical entities of the Executive branch will be conducting policy formulation and planning functions, the 2010 reform also gives more legitimacy to public policies, since institutions that received a mandate from the population for these roles will conduct them.

⁵⁷⁷ This point will be further examined in more detail.

⁵⁷⁸ Amrita Sen and others, 'Brazil's Struggles' Energy Aspects - In Focus <<https://www.energyaspects.com/publications/view/brazils-struggles>> accessed 15 June 2015.

The second aspect that has a positive impact on investments is the maintenance of the previous rules under Law 9,478 in areas not considered strategic and outside the pre-salt region, as well as all the resultant contracts that have been signed using this statute. The situation for investors would have been considerably worse had the government revoked Law 9,478 and not respected the existing contracts signed under its concession regime.

Finally, the third positive element is that the government has been giving signs that it has acknowledged certain drawbacks of the current regulations and has attempted to partially redress some of them in the Tender Protocol of the First Production-sharing Bidding Round divulged on 9 September 2013. The Protocol also included the draft of the production-sharing and the consortium contracts. The former was signed between the winner consortium members and the Ministry of Mines and Energy, while the latter had PPSA and the winning group as signatory parties.

These documents included some favourable provisions to potential investors, which partially offset the previously mentioned problems, increasing, therefore, the public tender's attractiveness. All the interviewees for this thesis who analysed the documents, except for one, expressed this view.⁵⁷⁹ Flavio Rodrigues was particularly vocal in this respect, stating that he had noted a real effort to remedy some detrimental effects brought by the 2010 oil regulations.⁵⁸⁰ Joao de Lucca followed suit, claiming even that the government was convinced of certain deficiencies of the 2010 framework, but could not change them because of the high political costs involved in the modifications and the implicit recognition of their mistake that the action would imply.⁵⁸¹ The political shortcomings would be particularly severe, according to him, in view of the proximity of the 2014 presidential elections.

The first aspect of the draft that acts in investors' favour is clause 33.5 of the draft contract between MME and the consortium members. The clause allows ANP to suspend the contractual timeframe for oil exploration in case of delays resulting from licensing procedures

⁵⁷⁹ Nine out of ten interviewees that had analysed the Tender Protocol at the time of their interviews.

⁵⁸⁰ Interview with Flavio Ofugi Rodrigues, Vice-President of Shell Brasil (Rio de Janeiro, 22 July 2013).

⁵⁸¹ Interview with Joao de Lucca, President of the Brazilian Petroleum Institute (IBP) (Rio de Janeiro, 05 August 2013).

conducted by Brazilian environmental authorities.⁵⁸² The provision is important in Brazil, since environmental authorisations in the country can be lengthy. It would be, therefore, unfair as well as burdensome not to allow contracted parties to be compensated for such delays. This positive aspect comes, however, with a caveat in the following clause that detrimentally affects investments. Clause 33.5.1 states that consortium members will not be compensated in cases of rejected environmental licences based on changes in the rules and criteria used by the competent authorities after the signature of the contract.⁵⁸³

The remaining favourable provisions for investments are in the consortium draft contract, which contains the most significant changes. Clause 6.3 allows members to audit all documentation and books of the operator related to the activities carried out on their behalf. This initiative is clearly aimed at reducing the previously mentioned information asymmetry between the operator, Petrobras, and other consortium parties.

The rules of the consortium with respect to deliberations have also significantly endeavoured to reduce PPSA's influence in the decision-making process, another previously analysed significant shortcoming. The establishment of approval procedures and thresholds that vary according to the strategic importance and stage of the issue under consideration allows consortium members to have a greater voice in deliberations, especially at the exploration phase, when their risks tend to be higher.⁵⁸⁴ According to the draft contract, PPSA will actually not interfere in deliberations taking place in this stage before the submission of the "Discovery Evaluation Plan". From that moment on, however, its influence in the decision-making process increases throughout most of the development and exploration phases.

Within this deliberation structure, the required approval thresholds on issues that PPSA holds voting rights were set in high percentages, varying from 82.5% to 91%. In contrast, a low quorum percentage of 32.5% was established for decisions where the state-owned company

⁵⁸² Clause 33.5 of the Draft Production-sharing Contract. Available at <http://www.brasil-rounds.gov.br/round_p1/ingles_P1/edital.asp> accessed 4th of June 2014.

⁵⁸³ Clause 33.5.1 of the Draft Production-sharing Contract. Available at <http://www.brasil-rounds.gov.br/round_p1/ingles_P1/edital.asp> accessed 4 June 2014.

⁵⁸⁴ Interview with Flavio Ofugi Rodrigues, Vice-President of Shell Brasil (Rio de Janeiro, 22 July 2013).

does not vote. The discrepancy actually reveals a governmental attempt to counterbalance PPSA's excessive influence in the operational committee, partially offsetting the previously mentioned agency problems derived from its high 50% voting share. It also reinforces Joao de Lucca's point of view about the government's acknowledgement of the deficiencies of the 2010 reforms and its incapacity to change it in view of the significant political costs in doing so.

Two relevant considerations arise from the establishment of the high quorum rates in issues under PPSA's deliberation scope. The first and most evident one is the considerable reduction of the company's decision-making capacity, which despite holding 50% of the voting shares, cannot approve deliberations by itself. Secondly, the risk of decisional deadlock is significantly increased, since the attainment of the minimum approval percentage is not necessarily guaranteed. This risk increases proportionally to the number of consortium members and inversely to the variance of their respective shares. This happens because transaction costs are significantly higher and the probability of reaching a common understanding also substantially greater the larger the number of actors involved in the issue under consideration. In other words, it is easier for four firms holding respectively 40%, 30%, 15% and 15% each (a low number of companies with a reasonable variance) to reach a 50% approval threshold, than for 50 corporations (a high number) holding 2% share each (low variance). Therefore, one can argue that if the high established thresholds significantly mitigate agency problems between PPSA and consortium members, it comes at the cost of the decision-making process, raising the risk of deliberation stalemates.

From a governance contractual standpoint, it is actually illogical and counterintuitive to confer high voting shares to an entity in a deliberative forum, while requiring at the same time an increased quorum for its deliberations. It would be easier to simply reduce the participation of this member and thereby avoid the possibility of decisional deadlocks. One can therefore infer that this odd situation was the result of a deliberate governmental intention to contractually remedy with high approval thresholds a legally defined situation in which PPSA's high shares would have evident drawbacks from an investor's perspective.

One final aspect that significantly increased the contract's attractiveness for investing companies is clause 1.21.4 of Annex XI, which spells out the rules for declaration of commerciality. A relevant risk for consortium companies pointed out by Flavio Rodrigues in an interview with the author is that Petrobras might wish to postpone the declaration of commerciality of certain areas because of its financial limitations or even for the urge in prioritising other areas where it already operates with high profitability. This risk is certainly not negligible because of the Brazilian National Oil Company's financial problems and its high opportunity costs, as sole operator in the vast domains of the Brazilian pre-salt area, as previously mentioned. This delay could certainly detrimentally affect other consortium members that are expecting a speedy return on their invested capital and also the government, which in theory should be interested in increasing production levels. By allowing members in the consortium qualified as "Level A operators" to declare commerciality of exploration areas jointly with PPSA, even against Petrobras' evaluation, the contract considerably reduces this risk.⁵⁸⁵ The consortium members will no longer depend exclusively on Petrobras' decisions for the important deliberation about the commerciality of blocks, as could have been the case because of this company's status as exclusive operator.⁵⁸⁶

Therefore, everything seems to indicate that the Brazilian government has recognised and acknowledged certain drawbacks of the 2010 regulatory framework and has attempted to remedy them through the Tender Protocol. This initiative is certainly commendable. Nevertheless, it is inevitably bounded by the oil sector's legal provisions and therefore operates within certain limits and constraints. In other words, the Tender Protocol and its contracts can certainly increase the attractiveness of investing in pre-salt layers and strategic areas of the Brazilian oil sector, but it has to maintain strict adherence to the legal framework and, therefore, operates with restrained leeway and limited room to manoeuvre. This limitation becomes evident in the draft consortium clauses that increase the deliberation quorum to

⁵⁸⁵ According to the Tender Protocol, companies will be qualified according to levels, based on the points they get according to several qualification criteria. Companies that score the highest according to those criteria are considered Level A operators.

⁵⁸⁶ The clause also establishes that Petrobras can declare on its own the commerciality of blocks.

mitigate PPSA's preponderance in the Operational Committee but at the same time increases the likelihood of decisional deadlocks, as previously explained.

6.5 CONCLUSION

Investment is an essential variable in the oil sector. It is even more important in the vast pre-salt domains, where the technological requirements are high and extremely sophisticated. The Brazilian National Oil Company, Petrobras, is currently facing severe financial limitations to undertake these disbursements. Other oil companies will therefore have to be significantly engaged in the endeavour, which reinforces further the importance of attracting investments in Brazil. Such imperative is clearly fundamental and goes hand in hand with the country's wider goal of increasing the national investment rate, to which the oil sector is supposed to act as a fundamental catalyst.⁵⁸⁷

This section analysed some important drawbacks of the current Brazilian oil regulatory framework that affect investment decisions. Petrobras' operational exclusivity was characterised as a major shortcoming, in view of the company's evident operational and financial limitations. The governance architecture established in the 2010 framework can also deter investments in several ways, giving rise to agency problems among entities and moral hazard situations because of contractual legal liabilities.

The governance setting established in operational committees is particularly worrying for potential investors because of their lack of voice in important decisions. As mentioned by Statoil's vice-president, Mauro Andrade, in an interview with the author: "we need to know if we will be able to be de facto partners with an effective say in all operational decisions or if we will simply be writing blank cheques". There are credible preliminary indications that investors are likely to be writing blank cheques, with minor roles in operational committees.⁵⁸⁸

⁵⁸⁷ Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013) 206.

⁵⁸⁸ Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013) 307.

It is telling, in this sense, that the first bidding round in the pre-salt region using the 2010 regulatory framework, which is considered the most attractive oil region in Brazil in the last decades, had only 11 interested companies. Government officials were expecting at least 40 registered companies, as revealed in their press statements.⁵⁸⁹

The presence of two Chinese NOCs is also telling, since they are not particularly concerned about the profitability and return of investments, but rather on the safe access to future oil deposits.⁵⁹⁰ Lin Boqiang, Chief of the Chinese Energy Research Centre, in an interview to the Brazilian newspaper *Folha de Sao Paulo*, explicitly mentions Chinese NOCs' priority. According to him, despite the uncertainties and problems in the first Brazilian production-sharing bidding round, the demand for oil in China is so intense that these companies do not have a choice and will participate anyway.⁵⁹¹

Brazilian regulations could be, therefore, creating a situation of adverse selection, whereby mainly risk-indifferent companies would be interested in investing in pre-salt layers and regions deemed strategic. Nevertheless, Shell and Total were also part of the winning consortium, with a 20% share each. These firms are naturally more sensitive to profitability and risk, if compared to Chinese NOCs', which are mainly concerned about access to hydrocarbon reservoirs. The presence of these private oil companies could be signalling, on the contrary, that adverse selection is not taking place. One cannot be totally sure, however, about the exact conditions established for Shell and Total to participate in the consortium, since only an extract of the contract is publicly available. They could have been offered special and advantageous contractual conditions of adherence, in an effort to increase the consortium's diversity. Government officials have constantly and insistently praised this diversity as the Tender's main achievement.

⁵⁸⁹ O Estado de Sao Paulo, 'Produção no pré-sal está abaixo da expectativa' *O Estado de Sao Paulo* <<http://economia.estadao.com.br/noticias/geral,producao-no-pre-sal-esta-abaixo-da-expectativa-imp-1116078>> accessed 11th of June 2014.

⁵⁹⁰ Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013) 213.

⁵⁹¹ Marcelo Ninio, 'Empresa chinesa no consórcio de Libra é alvo de ampla investigação por corrupção' *Folha de Sao Paulo* (Beijing) <<http://www1.folha.uol.com.br/mercado/2013/10/1360771-empresa-chinesa-no-consorcio-de-libra-e-alvo-de-ampla-investigacao-por-corrupcao.shtml>> accessed 11th of June 2014.

Most importantly, however, the public tender had only one offer and the amount of profit oil to the government was established at the minimal stipulated level. This result contrasted with the global context of escalating oil investment volumes across different countries in 2014,⁵⁹² which would normally lead to expectations of a public tender with several offers and a final profit oil result substantially higher than the initially indicated amount in the Tender Protocol. In spite of the government's effort to show that the bidding round has been a success, it is difficult to understand the underlying reasons.

Such outcome is even more troublesome considering that from 2008 until 2013, five years lapsed without any bidding round in the Brazilian oil sector because the government had been discussing the new framework and preparing Petrobras to be able to explore the extensive pre-salt basins.⁵⁹³ During this period, companies that were present in Brazil left the country to invest elsewhere, as mentioned by Flavio Rodrigues⁵⁹⁴ and Joao de Lucca⁵⁹⁵ in interviews with the author. They also acknowledged that the cost of coming back for these enterprises is significantly higher.

It is therefore evident that Brazil has to urgently tackle some of the hindrances analysed here to foster the essential required investments in the country's oil sector. As mentioned by Vitto and Hochstetler "it is quite ironic that the new regulatory framework severely restrains private parties' participation in the upstream petroleum sector in a moment that requires an exponential rise of the investment levels".⁵⁹⁶

There are some credible indications that the government of President Lula overestimated the attractiveness of the Brazilian pre-Salt oil discoveries and their capacity to draw investments when proposing the 2010 changes. Little attention was given to the careful

⁵⁹² International Energy Agency (IEA), 'Special Report World Energy Investment Outlook' (2014) 52.

⁵⁹³ Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013).

⁵⁹⁴ Interview with Flavio Ofugi Rodrigues, Vice-President of Shell Brasil (Rio de Janeiro, 22 July 2013).

⁵⁹⁵ Interview with Joao de Lucca, President of the Brazilian Petroleum Institute (IBP) (Rio de Janeiro, 05 August 2013).

⁵⁹⁶ Personal translation from Walter De Vitto and Richard Hochstetler, 'Perspectivas para os investimentos petrolíferos no Brasil' in Giambiagi and Velloso Lucas (eds), *Petróleo-Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2012) 309.

examination of how the framework would affect investors, under the assumption that the favourable geological conditions would be sufficiently attractive in themselves. Even though the 2010 reforms have brought some minor advancements and there have been some signs that the government has been recently attempting to mitigate some of the problems here examined, that is evidently not enough. The current regulatory framework has to urgently eliminate the mentioned investment hurdles to the benefit of the Brazilian oil sector and the country as a whole.

This chapter analyses the current regulatory framework's effect on production at the upstream level of the Brazilian oil sector.⁵⁹⁷ This was the segment mostly affected by the legal changes since the enactment of the 1988 Constitution, as previously discussed. The goal here is not to make forecasts about future production levels, providing a static input-output estimate, based on industrial capacity and performance probabilities. Several trustworthy entities already competently perform this task.⁵⁹⁸ Rather, the objective here is to provide an assessment of how the regulatory framework affects production, stressing those elements that foster or dampen it. The evidence presented here is essentially circumstantial, while the examination will take into account not only statutes and subsidiary legislation, but also norms, governance structures, interactions among entities and their informal interplay. This approach is based on the understanding that the "(...) assessments of regulatory governance need to go beyond formal attributes and to deal with actual functioning and effectiveness of rules."⁵⁹⁹

Of course, several other factors inevitably affect and explain oil production in diverse ways and different intensities. Detailing all these elements would certainly go beyond the scope of this thesis. Moreover, it would add so many variables to the study that its explanatory power would be considerably reduced. Using a standard Latin terminology in economics, one needs to make "ceteris paribus" assumptions⁶⁰⁰ to be able to draw consistent conclusions. The focus here will therefore be on the institutional aspects introduced by the 2010 reforms, acknowledging that other factors also come into play. The limitation of the analytical scope does not by any means affect the validity of the conclusions and their importance. Rather, the factors pointed out in the thesis will serve as essential starting points for public policy proposals aimed at incentivising production levels. In other words, the institutional setting might not be a definitive

⁵⁹⁷ The upstream sector comprises all the activities of exploration and production.

⁵⁹⁸ Cf. International Energy Agency: <<http://www.iea.org>> accessed 27 April 2015; and Energy Aspects: <<https://www.energyaspects.com>>, accessed 27 April 2015.

⁵⁹⁹ Paulo Correa and others, 'Regulatory governance in Brazilian infrastructure industries' (2008) 48 The Quarterly Review of Economics and Finance 202.

⁶⁰⁰ Assumptions that all other variables are kept constant, except the one being analysed.

determinant of production levels but it certainly boosts or deters it. That is the reason it is important to detect these catalysts or deterrent factors.

The main argument presented is that the current regulatory framework will adversely affect production levels in Brazil because of four of its aspects: the operational exclusivity, the consequent lack of competition it entails, the local content rules and pricing policies. Much of the theoretical framework used in the section comes from institutional economics, which primarily takes into account how firms and economic agents react and build their strategies according to the institutional environment in which they operate.⁶⁰¹ The central idea is that the institutional context shapes the country's oil sector and its governance design, which, in turn, influences companies' strategies and their performance.⁶⁰² As the 2010 reform provided significant alterations in the Brazilian oil sector, creating new entities, contractual conditions and regulations, it will most certainly impact on firms' behaviour and will, therefore, form an important explanatory component for the resultant production levels.

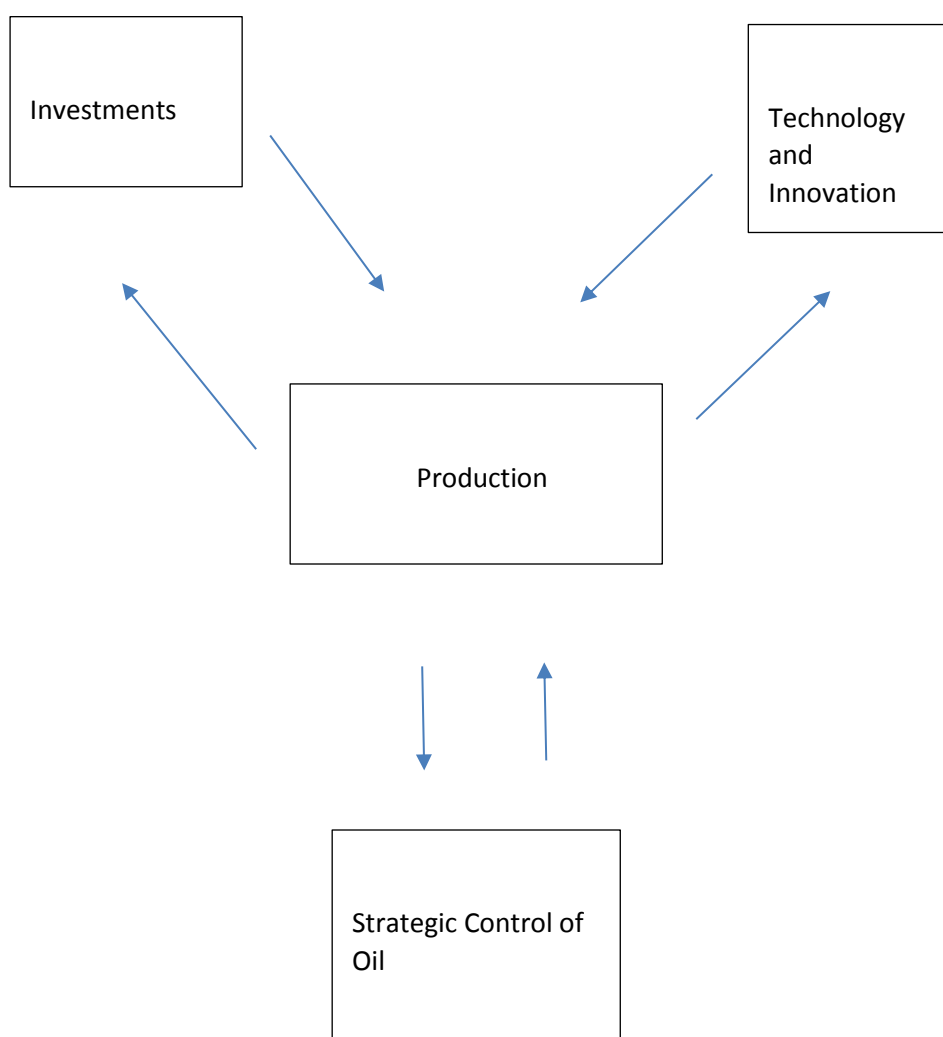
7.1 PRODUCTION IN THE OIL SECTOR

Production is a central variable in the oil sector, since it is undeniably linked to all other parameters considered in regulatory frameworks. Production influences and in turn is influenced by all the variables analysed in the thesis. Hence, investment, technology and innovation tend to increase production levels, while, on the other hand, they also face favourable prospects in sectors where the production perspectives are promising and valuable. The last studied variable - strategic value of oil, similarly, gains relevance whenever the production projections are favourable, while the higher the strategic importance attached to oil, the more its production levels will be incentivised. The following diagram summarises the two-way relationships between the studied variables and production:

⁶⁰¹ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 275.

⁶⁰² David G Victor, David R Hulst and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 888.

Figure 2: Interdependency of studied variables



Source: Self-elaboration.

The diagram therefore shows the interdependency of all these variables and their links to production levels. It underlines the importance of considering their joint interplay in a comprehensive manner. The transformation of oil, a finite resource, into enduring assets of long-lasting social benefits requires a holistic approach towards these key variables. Regulatory frameworks should ideally have this conversion as an essential objective to be achieved.⁶⁰³ In an interview with the author, Henrique Rzazinski, energy consultant and former BMG employee, alluded to the case of Norway, pointing out how the country successfully used its finite fossil

⁶⁰³ Interview with Henrique Rzazinski, Energy consultant and former BMG employee (Rio de Janeiro, 08 July 2013).

fuel wealth to transform it into a thriving technologically intensive industry, which nowadays exports services and products all over the world.⁶⁰⁴

Production should therefore be considered not merely as an end in itself, but as an essential variable that influences several others. An understanding of this multiple dependency among the studied parameters is fundamental for maximising the elements that foster them altogether, minimising, in turn, their potential inconsistencies.

A regulatory framework that jointly advances all the studied variables mitigates the risk of having what has been called a “resource curse, also known as “paradox of the plenty theory”.⁶⁰⁵ As already mentioned, the theory claims that an excessive dependency on export revenues of one single valuable natural resource commodity can deter the development of the country’s industries, infrastructure and social standards. This phenomenon has several explanatory factors, one of the most important is the so-called “Dutch Disease”.⁶⁰⁶ The “Dutch Disease” results from the appreciation of the country’s exchange rate because of the commodity’s exports. A higher exchange rate boosts imports, at the expense of local industries.⁶⁰⁷ By ensuring that production will not be the only reason of concern but an essential element to be considered conjointly with investment, strategic control of the product, technology and innovation, the risk of having a resource curse is lessened. This mitigation results from fostering several aspects that can leverage other sectors of the economy, which would reduce, in turn, the economy’s dependence on one single exportable commodity. Moreover, soaring investments and high technological and innovation standards in the oil sector can have significant spill-over and multiplier effects throughout the economy, mitigating further the one-product dependency, encouraging economic diversification instead. The oil and

⁶⁰⁴ Ibid.

⁶⁰⁵ Macartan Humphreys, Jeffrey Sachs and Joseph E Stiglitz, *Escaping the resource curse* (Cambridge University Press 2007).

⁶⁰⁶ According to Humphrey, Sachs and Stiglitz, other explanatory factors are: unequal expertise between governments and private investor companies that explore the natural resource, volatility of the income resultant from its exploration, insufficient investment in education, weak and unaccountable states. Cf. Ibid.

⁶⁰⁷ The term refers to the poor performance of the Dutch manufacturing sector in the 1970s as a direct consequence of the evaluation of the exchange rate because of exports of natural gas coming from the North Sea. Cf. Ibid. 5, 6.

gas sector has one of the longest and most intensive industrial chains.⁶⁰⁸ Long supply chains reveal greater propensity for creating economic multiplier effects.

Within this overall setting, the following discussion will examine the elements of the current regulatory framework that affect oil production in Brazil, citing, whenever appropriate, the possible repercussions in other areas. The first section will analyse Petrobras' operational exclusivity. The second will consider local content policies. The last two sections will examine in turn Petrobras' monopolistic condition and its pricing policies and their respective effects on production.

7.2 PETROBRAS' OPERATIONAL EXCLUSIVITY

The operational exclusivity has four different direct effects in terms of production and one indirect one, resulting from the lack of competition it entails. The four direct outcomes will be considered in this section, while the indirect one will be analysed separately in section 6.4.

The first direct effect results from the evident constraint in having only one firm explore an enormous area of 149,000 square kilometres, with hydrocarbon deposits found in depths between 5,000 and 7,000 metres, beneath thick layers of 2,000 metres of salt.⁶⁰⁹ Such limitation is even more acute for Petrobras, which is facing financial problems, as already discussed, and a recent corruption scandal.

The second one takes place because the requirement to develop this large area in view of the firm's financial limitations leads it to redeploy resources from current operational and productive domains to pre-salt reservoirs for future extraction. This transference would not be a problem in production terms if other oil companies could take over these on-going exploration blocks in regions not governed by Law 12,351. There is no evidence, however, that this is happening. The production figures show that there has actually been a slight drop in oil

⁶⁰⁸ Nadine Bret Rouzaut and Jean Pierre Favennec, *Petóleo & Gás Natural: Como Produzir e a que Custo* (Synergia 2011).

⁶⁰⁹ Oxford Analytica, 'The Impact of Pre-Salt: A Long-Term Perspective' (A Report Prepared for PETROBRAS, 2010) 4.

extraction at the Campos Basin⁶¹⁰ from approximately 2.2 mb/d in 2011 to roughly 2.1 mb/d in 2012.⁶¹¹ According to the World Energy Outlook 2013:

“The challenge that is felt most strongly by Petrobras, Brazil’s dominant upstream player, has been that while the enormous Santos pre-salt projects are in their heaviest investment period, the Campos basin is facing its own problems, including declining production from some of the more mature fields.”⁶¹²

In January 2013 ANP expressed concern about the continuous production decrease at the Campos Basin and demanded formal explanations from Petrobras. The Agency’s Director-General, Magda Chambriard, publicly stated that the company should make an “additional effort” to drill more wells.⁶¹³ Petrobras claimed that maintenance requirements of important platforms had led to the reduction of the production levels.⁶¹⁴ Yet its CEO, Graca Foster, later recognised that planning and investment problems related to the purchase of important equipment were affecting the production decline at the Campos Basin.⁶¹⁵

Therefore, there are indications that the Brazilian National Oil Company has been progressively shifting focus from the Campos Basin to the Santos Basin, located in the pre-salt reservoir, where the operational exclusivity applies. This rearrangement of priorities could explain the substantial drop in production in the first area, which has not been compensated by rises in the second one. Such resource redeployment could be one of the reasons for the fall in the company’s annual output in the past two years, with reduction rates of 2% in 2012 and

⁶¹⁰ Even though the Campos Basin is located in pre-salt basins, Law 12,351 and the production-sharing regime do not apply to the current production areas, since they have been contracted using the concession regime under Law 9,478.

⁶¹¹ International Energy Agency (IEA), ‘World Energy Outlook 2013’ (2013) 316.

⁶¹² Ibid. 316.

⁶¹³ Sergio Torres, ‘ANP examina queda na produção da Petrobrás’ *O Estado de São Paulo* (9 January 2013) <<http://economia.estadao.com.br/noticias/geral,anp-examina-queda-na-producao-da-petrobras-imp-982112>> accessed 23 June 2014.

⁶¹⁴ Ibid.

⁶¹⁵ Do Rio e de São Paulo, ‘Investimento alto e produção baixa pressionam resultados’ *Valor Econômico* (26 November 2013) <<http://www.valor.com.br/empresas/3351340/investimento-alto-e-producao-baixa-pressionam-resultados>> accessed 23 June of 2013.

1.6% in 2013.⁶¹⁶ Of course, several blocks in the Santos Basin are not yet fully operational and its production levels are expected to substantially increase in the future. Moreover, Campos Basin's blocks are more mature fields with lower productivity rates. Nevertheless, the main point here is that if there hadn't been an operational exclusivity, other oil companies could most certainly be operating in pre-salt domains, mitigating Petrobras' redeployment of resources from the Campos Basin.

The third effect of the operational exclusivity results from the impossibility of adequately exploring all the different areas, with their geological and logistical peculiarities, for lack of access to a wide array of technologies and expertise. Companies using other technologies and methods, in the absence of the exclusivity operational clause, could explore some domains that are not considered operationally viable to Petrobras. Joao de Lucca in an interview with the author explained that on some occasions certain blocks might not interest Petrobras but other companies may deem its exploration viable through the use of different techniques and know-how.⁶¹⁷

Finally, the fourth and final direct effect of Petrobras' exclusivity on production has already taken place through the interruption of public tenders, in 2008, when the initial discussions about a change in the Brazilian oil regulatory framework were launched. This interruption will have an inevitable impact in terms of production, since the regular rounds that had been taking place since 1999 were discontinued for five years. Initially, the public tenders were halted because of the discussions over the bill proposals and the alleged need to reformulate the oil exploration regime. However, after the approval of the new regulations, in 2010, there was no reason for not organising bidding rounds. The government only finally restarted the tenders in 2013.

It can be shown that Petrobras' exclusivity is inextricably linked with this long interruption of public tenders. Two main reasons explain the delay in organising new oil

⁶¹⁶ <http://www.petrobras.com/en/magazine/post/2013-net-income-of-r-23-57-billion.htm/> accessed 18 August 2014.

⁶¹⁷ Interview with Joao de Lucca, President of the Brazilian Petroleum Institute (IBP) (Rio de Janeiro, 05 August 2013).

auctions in Brazil. The first is Petrobras' incapacity to cope with additional expenditures, since it already has the most ambitious investment plan in the world among NOCs for the period 2012-2016. Because of the exclusivity, any bidding round in the pre-salt area would impose even higher investment costs and expenses on an already overburdened company.

The second reason is the priority given to the policy of developing a solid Brazilian industry of oil equipment, which supersedes the goal of increasing production levels or discovering new production frontiers. In other words, the incumbent government's priority has been to allow the Brazilian oil supply industry time to develop its capacity so it can adequately match the high demand that will naturally arise from the exploration of the Brazilian pre-salt basins.⁶¹⁸ This demand will be particularly propelled by local content policies adopted in Brazil.⁶¹⁹

Evidence that this second point is a plausible explanation for the public tender's five-year interruption is the fact that the government could have organised bidding rounds in areas not located in pre-salt reservoirs and not deemed strategic. For these locations, the already existent Law 9,478 would apply. But the government decided not to have public tenders in the oil sector. It could also have started bidding procedures in 2010, after the approval of the new oil regulations. This again did not happen and they were only resumed in 2013.

This long interruption will most certainly affect production prospects in the country. Had the bidding rounds not been suspended, Brazil would probably be producing in the near future a considerably higher volume of oil, and, consequently, be reaping the resultant benefits from the higher outcome via taxes, jobs and investments. Armando Guedes⁶²⁰ and Flavio Rodrigues⁶²¹ mentioned in interviews with the author that Brazil lost a significant window of opportunity with the halt of public tenders in 2008.

⁶¹⁸ Cf. Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013) 265; and Interview with Flavio Ofugi Rodrigues, Vice-President of Shell Brasil (Rio de Janeiro, 22 July 2013).

⁶¹⁹ See discussion below.

⁶²⁰ Interview with Armando Guedes, Former President of Petrobras (Rio de Janeiro, 21 July 2012).

⁶²¹ Interview with Flavio Ofugi Rodrigues, Vice-President of Shell Brasil (Rio de Janeiro, 22 July 2013).

Besides the evident fact of foregone income, the oil market in 2008 was also considerably more favourable for Brazil than it currently is. As previously stated, new discoveries have occurred since then and the oil price has plummeted. Technological developments have led to increasing fossil fuel replacement and the use of shale oil and gas has significantly expanded worldwide. Several specialists consider that the attractiveness of the Brazilian pre-salt area has considerably decreased since 2008.⁶²²

7.3 LOCAL CONTENT POLICIES IN THE OIL INDUSTRY

7.3.1 HISTORY AND RATIONALE

Local content policies are policies that favour the acquisition of national goods. They aim at developing the national industry of suppliers of goods and services through the concession of stimuli.⁶²³ The incentives can take diverse formats such as import tax levies on foreign competitors or the requirement that a certain percentage of expenditures be of national content. The principle underlying the policy is that the development of the national industry would not occur if left exclusively to normal market dynamics.⁶²⁴ The implicit logic is that a short-term inefficiency will be provisionally tolerated for attaining a more desirable long-lasting goal that more than compensates for it in the future. According to Silvana Tordo “Local content policies are in essence a trade-off between short-term efficiency and long-term economic development”⁶²⁵.

Theorists also stress the relevant task that leading economic sectors perform in stimulating industrial development in other segments through the creation of economic

⁶²² Cf. Interview with Amrita Sen, Chief Oil Analyst in Energy Aspects (London, 07 February 2014); Interview with Joao de Lucca, President of the Brazilian Petroleum Institute (IBP) (Rio de Janeiro, 05 August 2013); Interview with Armando Guedes, Former President of Petrobras (Rio de Janeiro, 21 July 2012); and Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013).

⁶²³ Luiz Cezar P Quintans, *Direito do petróleo: conteúdo local: a evolução do modelo de contrato e o conteúdo local nas atividades de E&P no Brasil* (Freitas Bastos Editora 2010) 4.

⁶²⁴ Eduardo Augusto Guimaraes, ‘Política de Conteúdo Local na Cadeia de Petróleo e Gás: Uma visão sobre a evolução do instrumento e a percepção das empresas investidoras e produtoras de bens’ (A Indústria e o Brasil, 2012) 15.

⁶²⁵ Silvana Tordo, *National oil companies and value creation* (World Bank Publications 2011) 9.

linkages.⁶²⁶ The use of the oil sector as an industrial catalyst of economic linkages has taken place in Norway, for example.⁶²⁷ It has also shaped the design of national content policies in Brazil.⁶²⁸

Despite the validity of local content policies and their effectiveness when adequately designed and enforced,⁶²⁹ they encompass a significant risk that the provisional stimuli of the targeted sector should become permanent, as a result of political pressure from influential interest groups. The enduring maintenance of supposedly provisional industrial protections is a recurrent trait of Brazilian economic history.⁶³⁰ National content policies should essentially be temporary, otherwise they become a distortive and perverse mechanism of rent transfer.⁶³¹ In the oil sector, this momentary nature is even more compelling because oil is essentially a non-renewable finite resource. Its industry of suppliers is, therefore, also provisional, unless it diversifies activities towards other sectors. Another possible alternative to mitigate this interim nature, extending the duration of the suppliers of the oil industry is to export to places that have newly discovered areas of high productive potential. As previously demonstrated, that is what happened in Norway. Yet this action requires the oil supply industry to be internationally competitive and is another important reason for national content policies to contemplate a phasing-out strategy and the eventual goal of bringing competitiveness to the targeted sectors.

⁶²⁶ Cf. Paul Stevens, 'National oil companies: good or bad?' National oil companies workshop: Current roles and future prospects <<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.197.8929&rep=rep1&type=pdf>> accessed 13 May 2014; Macartan Humphreys, Jeffrey Sachs and Joseph E Stiglitz, *Escaping the resource curse* (Cambridge University Press 2007) Albert O Hirschman, *Essays in trespassing: Economics to politics and beyond* (CUP Archive 1981).

⁶²⁷ Oystein Noreng, 'Brazil and Norway- Offshore Petroleum Experiences and Lessons' (2009) 35 *Journal of Energy and Development* 79.

⁶²⁸ Ibid.

⁶²⁹ David G Victor, David R Hults and Mark C Thurber, *Oil and governance: state-owned enterprises and the world energy supply* (Cambridge University Press 2011) 894, 895.

⁶³⁰ Cf. Tainara Machado, 'Falta de clareza inibe investimentos, diz economista' *Valor Econômico* (Sao Paulo, 11 November 2013) <<http://www.valor.com.br/brasil/3334052/falta-de-clareza-inibe-investimentos-diz-economista>> accessed 15 July 2014 Edmar Lisboa Bacha and Monica Baumgarten De Bolle, *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013); and Tainara Machado, 'Falta de clareza inibe investimentos, diz economista' *Valor Econômico* (Sao Paulo, 11 November 2013) <<http://www.valor.com.br/brasil/3334052/falta-de-clareza-inibe-investimentos-diz-economista>> accessed 15 July 2014.

⁶³¹ Cf. Walter De Vitto and Richard Hochstetler, 'Perspectivas para os investimentos petrolíferos no Brasil' in Giambiagi and Velloso Lucas (eds), *Petróleo-Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2012); and Silvana Tordo, *National oil companies and value creation* (World Bank Publications 2011) 10.

Local content policies can aim to achieve several goals. Eduardo Augusto Guimaraes distinguishes between two general categories: i) short-term macroeconomic goals linked to increasing employment rates; and ii) specific targets of longer maturity directed to the development of particular economic segments.⁶³² He claims that policy strategies should be designed according to their respective targets. Therefore, in the first case, the policy's scope should have a wider ambit, with additional incentives towards labour intensive sectors. The opposite occurs in the second instance, where focus on specific segments is imperative for its success. The enlargement of the policy scope in this second case will only unnecessarily burden companies required to adhere to local content requirements, increasing economic inefficiency and putting the main target at risk.

Guimaraes shows that lack of policy focus in local content policies can significantly undermine them and lead to significant shortcomings.⁶³³ If the government wishes, for example, to develop the subsea and engineering industries in the oil sector it should require firms to maintain certain percentage levels of purchase on those specific categories of goods and services and not a general rate applied to all their acquisitions. Guimaraes also stresses the importance of providing initiatives that foster the productivity of the targeted supply sector such as training and capacity building programmes, incentive actions, as he labels it, instead of only requiring mandatory purchasing commitments from buyers.⁶³⁴

Local content policies have been applied in the Brazilian oil sector since the 1970s. They were at that time established in accordance to Petrobras' purchasing policy because of its production exclusivity.⁶³⁵ In 1995, the exclusivity was revoked through a constitutional amendment and private oil companies were allowed to operate at the upstream level. National content policies, consequently, could no longer solely rely on Petrobras' acquisition policy. Therefore, from that moment until 2003, the policy was essentially conducted via local

⁶³² Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013) 336.

⁶³³ Ibid.

⁶³⁴ Ibid. 338.

⁶³⁵ Ibid.

commitment requirements, which were included as one of the public tenders' selection criteria.⁶³⁶ These conditions were then established in contracts signed between the winning consortium of companies and the Federal Government through obligations of acquiring a certain percentage of goods and services considered of national origin.

Non-compliance fines, in turn, were stipulated in ANP's administrative rules (Portarias). In spite of these penalties, the methodology to assess national content of goods and services had not been legally defined or described in regulations and contracts of any kind.⁶³⁷ This created a great deal of uncertainty for companies attempting to comply with the requirements and also posed difficulties for the government in enforcing them.⁶³⁸

The procedures were modified in 2003, when mandatory minimal local content thresholds were introduced, with the possibility of bids for additional proposal commitments at the moment of public tenders. The government did not publicise any assessment, report or study to justify the established minimal thresholds.⁶³⁹ Here again, the terms were then fixed between the signatory parties.

In that same year, Decree no. 4925 created the PROMINP (Programme to promote the national oil and natural gas industry), which had the main goal of increasing the share of the national industry of suppliers. One of PROMINP's projects was the creation of a Booklet (Cartilha), establishing a methodology to assess the national content of goods and services in the oil sector. The assignment was concluded in 2004 and in the following year the 7th Bidding Round provided for the mandatory use of the Booklet's methodology. Another innovation in that same round was the establishment of maximum percentage amounts for local content offers.⁶⁴⁰

⁶³⁶ Luiz Cezar P Quintans, 'Direito do petróleo: conteúdo local: a evolução do modelo de contrato eo conteúdo local nas atividades de E&P no Brasil' (2010).

⁶³⁷ Ibid. 75.

⁶³⁸ Ibid.

⁶³⁹ Ibid. 83.

⁶⁴⁰ Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013) 335.

National content policies changed once again in the oil sector in 2010, with the enactment of Law 12,351. The statute excluded local content requirements as a bidding criterion. Instead, minimum mandatory threshold levels were introduced. These would be defined according to each public tender in its protocol provisions. Since the development of a robust local industry of oil equipment is among one of the goals established for the enactment of Law 12,351,⁶⁴¹ local content requirements are expected to become increasingly high. In the first bidding round in pre-salt areas the required percentages were between 55 and 59% at the development phase and 37% at the exploration phase.

Apart from the mandatory minimum thresholds, another change brought by Law 12,351 was the reintroduction of the model existent before 1995, whereby national content policy was essentially dependent on Petrobras' purchases.⁶⁴² The company's operational exclusivity in pre-salt layers and areas deemed strategic is the main reason for that.

7.3.2 POSSIBLE EFFECTS OF LOCAL CONTENT POLICIES IN TERMS OF PRODUCTION

The current local content policy will have a detrimental effect on the country's production levels at the upstream sector and will affect Petrobras more intensively because of its exclusivity. The outcome will result from two complementary effects taking place in the context of an escalation of the demand for products in the oil industry, resulting from the progressive exploration of the pre-salt basin.

The first one is the increase in companies' costs because of the requirement of buying certain percentages of national goods, which are in most segments more expensive than their foreign competitors, or of inferior quality.⁶⁴³ The second is a delay in the supply of machinery

⁶⁴¹ See discussions in chapter 6.

⁶⁴² Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013) 347.

⁶⁴³ Cf. Eloi Fernandez and Bruno Musso, 'Oportunidades e Desafios da Agenda de Competitividade para Construção de uma Política Industrial na Área de Petróleo: Propostas para um Novo Ciclo de Desenvolvimento Industrial' Estudos e Pesquisas No. 384 Instituto Nacional de Altos Estudos; Jose Renato Ferreira de Almeida, 'Conclusões e Recomendações de Política' (Estudo da Competitividade da Indústria Brasileira de Bens e Serviços do Setor de P&G, 2007); Roberta Paduan, 'O Maior Desafio do País' *Exame* (27 June 2012) <<http://exame.abril.com.br/revista-exame/edicoes/1019/noticias/pre-sal-o-maior-desafio-do-brasil>> accessed 15 June 2015 and Eduardo Augusto Guimaraes, 'Uma avaliacao da

and equipment because of the lack of productive capacity of some of the national industry's sectors or even because several local companies are newcomers, inexperienced or not sufficiently established in the market.⁶⁴⁴

The impact of the national content policy on production levels has been assessed in a study conducted by the consultant company McKinsey, in which two diverse estimated outcome scenarios for oil in 2020 are respectively associated with two different local content requirement levels in Brazil. In the first case, maintaining the current rules, the oil production would be of 4.4 million of barrels a day in 2020, while in the second case, of more permissive and less restrictive national content conditions, the forecast would rise to 5.4 million barrels a day.⁶⁴⁵

Edmar Luiz Fagundes de Almeida similarly considers that there is an inherent trade-off between local content requirements and production levels. He claims that companies and the government will need to engage in discussions with respect to the repercussions and consequences of this trade-off.⁶⁴⁶ The debate is particularly important in view of the expected rising demand resulting from Petrobras' massive investment programme for the 2012 – 2016 period, considered the most ambitious in the world, with disbursements amounting to US\$ 237 billion.⁶⁴⁷

Taking into account these investments, Eduardo Augusto Guimaraes calculated Petrobras' expected annual expenditures in Brazil, applying the average local content

politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013).

⁶⁴⁴ Cf. Eloi Fernandez and Bruno Musso, 'Oportunidades e Desafios da Agenda de Competitividade para Construção de uma Política Industrial na Área de Petróleo: Propostas para um Novo Ciclo de Desenvolvimento Industrial' Estudos e Pesquisas No. 384 Instituto Nacional de Altos Estudos; Jose Renato Ferreira de Almeida, 'Conclusões e Recomendações de Política' (Estudo da Competitividade da Indústria Brasileira de Bens e Serviços do Setor de P&G, 2007); Roberta Paduan, 'O Maior Desafio do País' Exame (27 June 2012) <<http://exame.abril.com.br/revista-exame/edicoes/1019/noticias/pre-sal-o-maior-desafio-do-brasil>> accessed 15 June 2015 and Eduardo Augusto Guimaraes, 'Uma avaliação da política de conteúdo local na cadeia do petróleo e gás' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013)

⁶⁴⁵ Roberta Paduan, 'O Maior Desafio do País' Exame (27 June 2012) <<http://exame.abril.com.br/revista-exame/edicoes/1019/noticias/pre-sal-o-maior-desafio-do-brasil>> accessed 15 June 2015 46.

⁶⁴⁶ Edmar Luiz Fagundes de Almeida, 'Seminário GEE2013: Os Desafios da Energia no Brasil' (2013).

⁶⁴⁷ Christopher Garman and Robert Johnston, 'Petróleo: o Brasil no contexto de um panorama global em transformação' in Giambiagi (ed), *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier 2013) 265.

percentage requirements of the last bidding rounds. He concluded that the national industry will need its supply capabilities to annually be somewhere in between US\$16.5 and US\$ 18.5 billion to cope with the Brazilian National Oil Company's local acquisitions in the next years. He claims that Brazilian producers are not prepared to match such amounts.⁶⁴⁸ In line with this argument, the World Energy Outlook predicts shortages in the supply of subsea equipment, support vessels and FPSOs⁶⁴⁹ in Brazil given the amount of future estimated expenditures at the pre-salt basin.⁶⁵⁰

Numerous delays in projects and equipment purchase are already taking place in Brazil, while complaints about the surcharge of Brazilian suppliers equally abound.⁶⁵¹ Analysts expect the situation to worsen in the future with the steep forecasted upsurge in demand coming from the exploration of the pre-salt basin.⁶⁵² Even Petrobras has been having problems in coping with its local content commitments and has been fined by ANP in 2011 for non-compliance in five of its 44 assessed blocks.⁶⁵³

The imposition of fines on Petrobras is emblematic, since the company has historically been a pivotal implementer of local content policies and a focal point for the government to guarantee their success. It also engenders concerns about their actual feasibility, since the non-compliance of this key policy implementer entity might implicate that they should be reconsidered.

Petrobras' position with respect to local content policies reveals its dilemmas as a partially state-owned enterprise. If on the one hand it is in the government's interest to strictly

⁶⁴⁸ Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013).

⁶⁴⁹ Floating production, storage and offloading.

⁶⁵⁰ International Energy Agency (IEA), 'World Energy Outlook 2013' (2013) 374.

⁶⁵¹ Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013) 148.

⁶⁵² Cf. Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013) 347; Helder Queiroz Pinto Jr and Mariana Iooty, 'Perspectivas de Desenvolvimento do Setor Petróleo e Gás no Brasil' (2010) 55 *Serie Eixos do Desenvolvimento Brasileiro* 27; and Jose Renato Ferreira de Almeida, 'Conclusoes e Recomendacoes de Politica' (Estudo da Competitividade da Industria Brasileira de Bens e Servicos do Setor de P&G, 2007).

⁶⁵³ Roberta Paduan, 'O Maior Desafio do Pais' *Exame* (27 June 2012) <<http://exame.abril.com.br/revista-exame/edicoes/1019/noticias/pre-sal-o-maior-desafio-do-brasil>> accessed 15 June 2015.

encourage these policies, on the other hand, this comes at a cost for the company, as previously demonstrated. This cost is expected to increase further as the exploration of pre-salt basin intensifies.

The dual instructions coming from the Presidency of the Republic and the company's CEO are symptomatic of Petrobras' ambiguities as a partially state-owned company. In February 2012, for example, President Dilma gave explicit instructions for Petrobras' CEO, Gracas Foster, to prioritise local content policies at a time when the company was facing problems complying with its commitments.⁶⁵⁴ The episode shows not only the degree of presidential interference in Petrobras' affairs, but also how national content policies are deemed important for the government. One month later, however, Petrobras' CEO expressed in an interview to the Brazilian media that these policies could detrimentally affect the company's interests.⁶⁵⁵ The supply industry received her comments with substantial apprehension and started questioning the company's actual engagement with national content policies. The situation escalated to an extent that required the intervention of the Secretary of Oil and Gas, from the Ministry of Mines and Energy, Marco Antonio Almeida, who gave an interview stating that Petrobras remained strictly engaged and committed to its local content duties.⁶⁵⁶

Local content requirements in the first public tender in pre-salt areas in 2013 were maintained at similar levels to the last bidding rounds using the concession regime, with rates varying between 55 and 59%, at the development phase, and 37%, at the exploration phase. In spite of this fact, if supply problems are already taking place with the current levels of purchases from the upstream sector they are expected to intensify in the future with the estimated forthcoming upsurge in demand for exploring further the pre-salt basin.

⁶⁵⁴ Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013) 148.

⁶⁵⁵ Cf. Marta Nogueira e Rodrigo Polito, 'Petrobras vai exigir conteúdo local' *Valor Econômico* (Rio de Janeiro, 26 March 2014) <<http://www.valor.com.br/empresas/3494426/petrobras-vai-exigir-conteudo-local>> accessed 13 October 2014; and Equipe do Rio de Janeiro, 'Mercado espera clareza sobre reajustes da Petrobras' *Valor Econômico* (Rio de Janeiro, 12 December 2013) <<http://www.valor.com.br/empresas/3369618/mercado-espera-clareza-sobre-reajustes-da-petrobras>> accessed 12 July 2014.

⁶⁵⁶ Marta Nogueira e Rodrigo Polito, 'Petrobras vai exigir conteúdo local' *Valor Econômico* (Rio de Janeiro, 26 March 2014) <<http://www.valor.com.br/empresas/3494426/petrobras-vai-exigir-conteudo-local>> accessed 13 October 2014.

One of the most common criticisms of the Brazilian local content policy is its lack of focus.⁶⁵⁷ As stated by Alfredo Renault, in an interview with the author, it is impossible to be competitive in everything, so the policy should ideally assess those products and services that hold conditions to compete internationally and prioritise them.⁶⁵⁸ All other interviewees for the thesis not working for the government who expressed views on the topic shared his opinion. One of the seventeen government officials interviewed expressed his criticisms about the policy under condition of anonymity and asked them not to be detailed.

Eduardo Augusto Guimaraes, in turn, criticises the lack of transparency with respect to local content oil policies' goals.⁶⁵⁹ He contends that the wide scope of the contemplated sectors would only make sense if the policies' objectives were to reduce unemployment. Yet in that case other labour intensive economic segments should also be included and not only the oil sector. On the other hand, if the goal is to build a robust oil supply industry, he claims, the lack of focus on some selected strategic sectors undermines the policy as a whole, since less productive segments will drain resources from the more productive ones, which have the effective conditions to face foreign competition in the future, thereby overcoming the initial protection.

In spite of these facts, the delay in the national industry's supply of material and equipment, its higher prices and the detrimental effects in terms of production levels do not appear to raise significant concerns within the government. As previously mentioned, the government seems to prioritise the development of the local industry of suppliers, a rather

⁶⁵⁷ Cf. Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013) and Interview with Alfredo Renault, Superintendent of the National Organisation of the Petroleum Industry (ONIP) (Rio de Janeiro, 20 July 2012).

⁶⁵⁸ Interview with Alfredo Renault, Superintendent of the National Organisation of the Petroleum Industry (ONIP) (Rio de Janeiro, 20 July 2012).

⁶⁵⁹ Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013).

long-term goal, over other targets of increasing production levels.⁶⁶⁰ Some specialists consider even that this is one of the reasons for the five-year bidding round time lapse in Brazil.⁶⁶¹

The goal of allowing the industry of suppliers time to adapt to a new reality of increasing demand is certainly commendable and has been effectively used in other places such as Norway.⁶⁶² Yet it should be implemented with adequate actions for capacity building and minimising possible fallouts.

In the Brazilian case, for example, completely ceasing public tenders for these purposes is certainly not appropriate and can even be counter-productive.⁶⁶³ A more recommendable policy would be to provide a gradual increase in the national content requirements, allowing the supply industry progressive time to adapt. Another possible option would be to continue with the auctions, offering smaller blocks, encouraging the industry to steadily adapt its production levels, while gradually signalling what are the suitable investment levels to be undertaken in the future. These initiatives would confer greater predictability to investment decisions, allowing for a continuing fine-tuning of the required investment amounts to match future demand, while also minimising the shortcomings on production levels. The opposite occurs if public tenders are completely halted, since the supply industry in this case will certainly face problems in planning its future investment amounts to meet forthcoming purchases because of the difficulty in estimating prospective demand. This drawback is particularly compelling in Brazil, since according to a thorough study conducted by Oliveira within the PROMINP project, one of the important hurdles for increasing local industrial capacity in the country is uncertainty about future demand.⁶⁶⁴

⁶⁶⁰ Christopher Garman and Robert Johnston, 'Petróleo: o Brasil no contexto de um panorama global em transformacao' in Giambiagi (ed), *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier 2013) 265.

⁶⁶¹ Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013)

⁶⁶² Oxford Analytica, 'The Impact of Pre-Salt: A Long-Term Perspective' (A Report Prepared for PETROBRAS, 2010) 20.

⁶⁶³ The argument that the government stopped public tenders to allow the national industry time to develop is not unanimous and there are some credible elements that show that it might not apply. See previous discussions.

⁶⁶⁴ Jose Renato Ferreira de Almeida, 'Conclusoes e Recomendacoes de Politica' (Estudo da Competitividade da Industria Brasileira de Bens e Servicos do Setor de P&G, 2007) 19.

The government is certainly right to favour long-term policies with long lasting effects on its industrial structure over short-term initiatives and actions that boost production, for example. Yet this preference does not require radical initiatives such as the interruption of public tenders.⁶⁶⁵ Rather, it demands consistent and studied actions that confer leeway and room to manoeuvre for the industry of suppliers to meet its targets, and, most importantly, a consistent programme of incentives for increasing its productivity levels.

National content policies in the industry of suppliers to the upstream sector have been present in Brazil since the 1970's and they are not a completely new initiative that requires starting-up or reinventing local manufacturing. Therefore, policies targeted to this sector should primarily focus on the improvement of the existing structure, in actions that foster the increase of its actual capacity to meet current and future demand. The industry should adapt to a new productive reality instead of being reformulated. The policy requires more actions to boost sectorial productive capacity instead of those aimed at creating a protective and captive market.

Another essential shortcoming of the current local content policy is its excessive reliance on only one company, which has been facing significant financial hurdles, as previously examined, and difficulties in coping with the policy's current requirements. Even more worryingly, if the situation is already problematic in the present context, it is expected to worsen significantly in the future because the massive investment levels required to explore the pre-salt basins will implicate a substantial increase in demand of local supplies, which if not met will lead to additional fines and further financial constraints for Petrobras. Even though there is the possibility of applying for a waiver of local policy commitments in cases of "significant supply delays" or when Brazilian prices are considered "exceedingly high", compared to the international market, these procedures take time. Moreover, they involve a subjective evaluation of vague terms - "exceedingly high prices" and "significant supply delays", which

⁶⁶⁵ As discussed in section 8.2, theorists consider that one of the reasons for suspending public tenders was the goal of allowing time for the national industry of suppliers to develop.

require ANP's approval.⁶⁶⁶ The outcome of any application, as a consequence, is far from predictable and raises significant uncertainties.

More importantly, Petrobras will be the only upstream company affected by local content policies in the vast pre-salt basins because of its exclusivity in the area. In other words, the Brazilian National Oil Company will be bearing the immediate alluded policy drawbacks, via higher costs, potential delivery delays and quality concerns. It is quite illustrative that Petrobras' costs have risen by more than 30% per year from 2010 levels.⁶⁶⁷

The excessive reliance on one sole firm at the upstream level for the policy exacerbates another problem that has already been affecting the supply industry in Brazil. Providers become totally dependent on Petrobras' demand, which takes place throughout the year according to peaks and troughs that vary according to its own corporate requirements and priorities.⁶⁶⁸ Local suppliers therefore plan their sales based on an estimated average demand and, as consequence, cannot reap the benefits of economies of scale of all possible transactions. Moreover, at times of high demand, Petrobras needs to import products because national providers cannot meet its requirements.⁶⁶⁹

Analysts have suggested some mechanisms to circumvent this problem such as spreading Petrobras' purchases more evenly throughout the year so as to enable suppliers to take advantage of economies of scale.⁶⁷⁰ This suggestion might suit providers, yet it will most probably shift the problem to Petrobras instead, since it will possibly lead to a significant cost

⁶⁶⁶ Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013) 344.

⁶⁶⁷ Amrita Sen and others, 'Brazil's Struggles' Energy Aspects - In Focus

<<https://www.energyaspects.com/publications/view/brazils-struggles>> accessed 15 June 2015 35.

⁶⁶⁸ Cf. Jose Renato Ferreira de Almeida, 'Conclusoes e Recomendacoes de Politica' (Estudo da Competitividade da Industria Brasileira de Bens e Servicos do Setor de P&G, 2007); Helder Queiroz Pinto Jr and Mariana Iooty, 'Perspectivas de Desenvolvimento do Setor Petróleo e Gás no Brasil' (2010) 55 Serie Eixos do Desenvolvimento Brasileiro; and Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013)

⁶⁶⁹ Jose Renato Ferreira de Almeida, 'Conclusoes e Recomendacoes de Politica' (Estudo da Competitividade da Industria Brasileira de Bens e Servicos do Setor de P&G, 2007).

⁶⁷⁰ Cf. Ibid.; Helder Queiroz Pinto Jr and Mariana Iooty, 'Perspectivas de Desenvolvimento do Setor Petróleo e Gás no Brasil' (2010) 55 Serie Eixos do Desenvolvimento Brasileiro; and Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013).

for the company in storing material and equipment during idle periods. It might also significantly escalate transaction costs within the firm's different corporate units, in preparing a complex planning schedule to accommodate and fine-tune its business, financial and commercial policies accordingly throughout the year in a manner compatible and harmonised with suppliers' requirements.

Here again Petrobras' exclusivity has substantial limitations for the national industry of suppliers, since the presence of several operating upstream companies would mitigate the problem of having demand peaks and troughs, reducing, at the same time, the risk of relying on only one buyer. It could, moreover, bring local suppliers closer to foreign upstream companies, facilitating future joint international projects.⁶⁷¹ Petrobras' exclusivity in Law 12,351 therefore reinforces one of the bottlenecks for the existence of a vigorous local industry of suppliers in Brazil. The maintenance of the current national content policy without eliminating or reducing this bottleneck or fostering the production capability of local suppliers will only worsen the current problems of delay, overpricing and quality, at the expense of oil production at the upstream level.

Another hindrance of local content policy which results from Petrobras' exclusivity is that it creates a legal monopsony in pre-salt basins and strategic areas, which enables the company to take advantage of its market power to reap favourable deals, detrimentally affecting national suppliers.⁶⁷² Ironically, local content requirements could aggravate the expected drawbacks following from this market structure, since the Brazilian National Oil Company could perfectly attempt to compensate for its additional costs in areas where it is committed to national purchases, by imposing its bargaining power for the reduction of prices in areas where the requirements do not apply. Depending on the extent to which these practices affect the supplier industry the drawbacks could even surpass the benefits accruing from the local content policy, thereby totally undermining it.

⁶⁷¹ Eloi Fernandez e Fernandez, 'Industria nacional de bens e servicos nos arranjos produtivos do setor de oleo e gas natural no Brasil' in Giambiagi (ed), *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Brasil 2013) 109.

⁶⁷² Oxford Analytica, 'The Impact of Pre-Salt: A Long-Term Perspective' (A Report Prepared for PETROBRAS, 2010) 25.

Finally, one should always bear in mind that local content policies can also act as an effective means to reduce the risk of having a resource curse in oil intensive countries. Yet its effective achievement requires fostering the long-term competitiveness of national firms, an action that reduces the excessive dependency on exports of one sole commodity. In this sense, it is essential to promote activities that i) increase the productivity of local suppliers; and ii) support a progressive phasing out of the dependency on the captive market created with national content requirements.

This presupposes actions that reduce production costs, increase labour force qualification standards in the sector and provide innovation stimuli, but also an endeavour to mitigate all aspects that affect the overall competitiveness of the national industry as a whole, such as access to funds and loans on competitive terms, improvement of the national infrastructure and of the educational levels. A certain number of initiatives have already been launched in Brazil within this in mind, such as the escalation of BNDES and FINEP's capital funds for loans directed to companies aiming at investing in technology and innovation and the creation, in 1999, of CT-Petro, and of PROMINP, in 2003.⁶⁷³ CT-Petro funds projects with the goal of increasing the productivity and quality of products in the oil industry, as well as reducing its costs and prices. PROMINP is a programme that seeks to increase the share of the national industry of suppliers. These projects are important first steps that should be further stimulated to become national priorities.

It is also essential to signal to firms targeted by national content policies that the protection is, above all, temporary, and a means to achieve an ultimate goal: competitiveness and non-dependence on the local market. Unfortunately, nothing has been done in this sense hitherto in Brazil. When conducting the interviews for this thesis the author inquired about the existence of any phasing-out initiative, but the interviewees were not aware of anything, which is particularly worrying. Ignoring this important aspect will inevitably affect the local content policy and the national industry's capacity to adequately supply the upstream sector in the

⁶⁷³ Francisco Ebeling Barros, 'A Governança do Pré-Sal: Uma Análise sob a Ótica da Literatura das Variedades de Capitalismo' (Dphil thesis, Universidade Federal do Rio de Janeiro 2013) 145,148.

future, leading it to enduringly depend on the captive market created by the protection, at the long-lasting expense of production at the upstream sector.

7.4 PETROBRAS' MONOPOLISTIC CONDITION AND ITS PRODUCTION EFFECTS

The operational exclusivity, in itself, confers substantial limitations on the competition conditions in pre-salt layers and strategic areas. Even though some degree of competition is still possible at the moment of the auctions, when the different consortia are formed, rivalry is significantly reduced because Petrobras is required to have at least a 30% share in all groups. Therefore, scarce are the incentives for more than one group to be formed in each public tender, because all partners will naturally prefer to be with Petrobras, which not only has operational exclusivity, but also is a firm with extensive and detailed knowledge in Brazilian basins. Petrobras, in turn, will also be inclined to choose only one consortium, which offers the best conditions, or may even suggest the dismantlement of certain groups and the formation of new ones based on the negotiations it has with other companies before the auctions.

The 2010 regulations reinforce one of the problems that had already been taking place in Brazilian oil sector's public tenders until then: the "winner's curse". According to the winner's curse theory, in auctions where one of the firms holds significantly more information about the real value of the auctioned object than others, there is a tendency for the other bidders to reduce their bids for fear of offering a higher value than the real one, facing, as a consequence, losses. This explains the term "winner's curse", which basically is a loss derived from an excessively high bid for lack of information.⁶⁷⁴ Cesar Mattos points out that one of the reasons for Petrobras' success in public tenders in the Brazilian oil sectors since 1997 is other companies' fear of the winner's curse.⁶⁷⁵ This phenomenon is significantly bolstered with the 2010 reform because reluctance to bid will naturally follow from the companies that have not received formal acquiescence from Petrobras in the pre-negotiations to the public tender, when forming the consortia groups. The fact that the first bidding round in pre-salt layers using the

⁶⁷⁴César Mattos, 'Licitações da ANP, PETROBRAS e a "Maldição do Vencedor"' (2008) MARCOS REGULATÓRIOS NO BRASIL 65.

⁶⁷⁵ Ibid.

2010 regulations has had only one bid and one consortium group might be an illustration of this fact.

Therefore, the 2010 regulations create a situation in which Petrobras holds a “de facto” economic monopoly in pre-salt basins and in areas considered strategic. Even the scarce possibility of having some competition during the bidding rounds is significantly hampered by the winner’s curse phenomenon and by the fact that other oil companies only participate financially.

The “de facto” monopoly has severe consequences for production and innovation. As eloquently stated by Armando Guedes in an interview with the author, one of the worst effects of the operational exclusivity established in Law 12,351 is that the company will lose competitive references and will therefore be induced to operate less dynamically.⁶⁷⁶ Flavio Ofugi, also shared this opinion.⁶⁷⁷ They both recognised the positive aspects brought by competition within the Brazilian concession regime, which has been significantly reduced in the 2010 regulations in force in the pre-salt basin and in areas deemed strategic.⁶⁷⁸

Within this setting, Petrobras will certainly face fewer incentives to increase its productivity and to invest in innovation of its services and quality standards, if compared to a scenario of open competition with other oil companies. This discouragement will have inevitable impacts on production levels. The outcome is reinforced by the fact that the operational exclusivity will inevitably lead Petrobras to divest in other countries and locations in view of the urge to develop pre-salt basins and areas deemed strategic, as previously explained. The Brazilian National Oil Company has already engaged in a vast divestment programme with significant reduction of its international exposure.⁶⁷⁹ The substantial

⁶⁷⁶ Interview with Armando Guedes, Former President of Petrobras (Rio de Janeiro, 21 July 2012).

⁶⁷⁷ Interview with Flavio Ofugi Rodrigues, Vice-President of Shell Brasil (Rio de Janeiro, 22 July 2013).

⁶⁷⁸ The US shale oil revolution is an illustrative example of competitive pressures leading to technologic advancements and to the development of techniques that significantly propelled North-American production levels. Cf. Knowledge@wharton, ‘Will Resource Nationalism Spoil Brazil’s Big Oil Future?’ Knowledge@wharton Public Policy <<https://knowledge.wharton.upenn.edu/article/will-resource-nationalism-spoil-brazils-big-oil-future/#>> accessed 20 March 2013

⁶⁷⁹ Amrita Sen and others, ‘Brazil’s Struggles’ Energy Aspects - In Focus <<https://www.energyaspects.com/publications/view/brazils-struggles>> accessed 15 June 2015.

constriction of Petrobras' operational capabilities and options undermines its ability to adequately explore the best corporate possibilities and joint venture activities, according to its own financial and strategic priorities. This restriction inevitably undermines the company's production capacity. Furthermore, by concentrating all of its activities in one exploration frontier, where it acts as an actual monopolistic firm, the company significantly elevates its risks and cannot adequately share the productive and investment burdens with other partners, as it has effectively done in the last 20 years.⁶⁸⁰ As already mentioned, diversification is very important in the upstream oil sector because the success rate of exploration activities is rather low, around 25%.⁶⁸¹ Oil companies therefore reduce the chances of not finding oil in viable commercial levels, by having a diversified international exploration portfolio.

Felipe⁶⁸², Wagner Freire⁶⁸³ and Luiz Paulo Vellozo Lucas⁶⁸⁴ show how Petrobras has benefited from competition in the oil sector from 1994 to 2010. The situation in the mid 1990's posed the same type of challenges to the current ones faced by Petrobras. At that time there was also an urge to explore a vast offshore area: the Campos Basin. The difference, however, was that the model established in 1997 allowed for the presence of other operator companies with which Petrobras could share all of its operational and financial risks. The framework also contemplated competition between firms in public tenders as an essential element, which does not completely happen with the current regulations because of Petrobras' operational exclusivity and the several limitations imposed on other oil companies that participate as Petrobras' financial partners in consortia. In contrast to the sombre predictions made by some critics at the time, competition in the 1990's significantly boosted Petrobras' performance.

⁶⁸⁰ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 190-191.

⁶⁸¹ Nadine Bret Rouzaut and Jean Pierre Favennec, *Petróleo & Gás Natural: Como Produzir e a que Custo* (Synergia 2011), 162. This argument should be nuanced, however, since the success rate of exploration activities in the pre-salt basin is considered higher than most other areas around the world.

⁶⁸² Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010) 190.

⁶⁸³ Wagner Freire, 'Petrobras: Das origens até os anos 1990' in Fabio Giambiagi (ed), *Petróleo: Reforma e contrarreforma do setor petrolífero brasileiro* (Ed. Elsevier 2012)

⁶⁸⁴ Luiz Paulo Vellozo Lucas, 'A derrota de um modelo de sucesso' in Giambiagi (ed), *Petróleo-Reforma e Contrarreforma do setor petrolífero brasileiro* (Elsevier 2012)

In radical contrast with that situation, Petrobras' present "de facto" monopoly in the pre-salt basin and in areas deemed strategic, together with its current financial and operational constraints, will most probably lead to a perverse outcome whereby the company will have a natural incentive to concentrate on projects with greater profitability, while leaving other less attractive ones for the future. The adverse consequences of this occurrence have already been cited in the last chapter concerning investments. There is also a considerable effect in terms of production that should be equally taken into account. It is therefore likely that the Brazilian National Oil Company will focus its activities in areas under the onerous relinquishment regime, where the Special Participation tax is not levied,⁶⁸⁵ leaving other ventures to be developed at a slower pace or at a second stage. There are consistent signs that this might already be happening and may be one of the reasons behind the previously mentioned shift of resources from the Campos Basin to the Santos Basin. While the former area is under a concession regime, where the company pays the Special Participation tax, all blocks under the onerous relinquishment regime are located in the latter locations. Once again, this perverse production disincentive could be perfectly avoided if other companies were allowed to operate at the pre-salt basin and in areas deemed strategic.

The operational exclusivity therefore creates a perverse vicious cycle for Petrobras, since its own existence requires significant investment amounts of one sole firm in an enormous area. Because of this investment obligation, the company is required to substantially escalate its production levels to create the necessary funds to match such necessities, especially considering its difficulties in raising further loans because of financial problems. Yet this very exclusivity hampers, on the other hand, the company's ability to plentifully develop its productive capacity.

7.5 PRICING POLICIES AND THEIR EFFECTS ON PRODUCTION

Petrobras' pricing policies will also affect its production capacity. As previously explained, the company has been shifting resources from its core business and more lucrative

⁶⁸⁵ Paulo César Ribeiro Lima, *Pré-sal, o novo marco legal e a capitalização da Petrobras* (Synergia Editora 2011) 85.

upstream sector to the less rewarding downstream segment.⁶⁸⁶ This is a result of the increased downstream demand, as a direct consequence of the pricing policies until the second semester of 2014 that consistently maintain prices below international levels. One of the results of this shift is, therefore, a reduction of the upstream production levels.

Despite this negative consequence in production terms, one could argue that there could be a socially positive element to the pricing policy engendering it, if the contemplated price reduction was meant to offset an excessive monopolistic charge, to costumers' benefit. Yet that is not the case, since the subsidy does not benefit the socially disadvantaged and tends to benefit the better-off, instead, creating a typical socially regressive policy. This is because consumers who most intensively use oil products as a percentage share of their income are wealthier.⁶⁸⁷ Moreover, since Petrobras is a state-controlled enterprise, the Federal Government loses valuable revenue with the pricing policy that could be otherwise spent in social programmes.

The IMF in 2013 conducted a study on energy subsidies showing how regressive these policies were, since they tended to “divert public resources away from spending that is more pro-poor”.⁶⁸⁸ According to the IMF:

“In many subsidizing countries, equity could be improved by reallocating outlays toward better targeted programs in health, education, and social protection. Over the longer term, the removal of subsidies, accompanied by a well-designed safety net and an increase in pro-poor spending, could yield significant improvements in the well being of low-income groups. In oil-exporting countries, subsidies are often used as a tool for sharing oil wealth with its citizens. But given the high share of benefits that accrues to upper-income groups, the inefficiencies that subsidies create in resource allocation, and in some countries the large share of the expatriate population, energy subsidies are

⁶⁸⁶ Edmar Luiz Fagundes de Almeida, 'Seminário GEE2013: Os Desafios da Energia no Brasil' (2013).

⁶⁸⁷ International Monetary Fund (IMF), 'IMF: Energy Subsidy Reform: Lessons and Implications' (2013).

⁶⁸⁸ Ibid. 19.

a much less effective policy instrument for distributing wealth than other public spending programs.”⁶⁸⁹

Therefore, Petrobras’ current pricing policies not only have detrimental effects on production at the upstream level but they also are an ineffective mechanism of wealth distribution to the poorest.

7.6 CONCLUSION

The current regulatory framework will impact production in several ways. Because of Petrobras’ operational exclusivity, the company will not have resources to explore by itself such a vast area and this limitation will inevitably affect Brazilian production levels. Other consequences resulting from the exclusivity are the interruption of bidding rounds for five years, the impossibility of counting with a diverse range of firms with different use of technologies and the transference of resources from current operational domains to pre-salt reservoirs for future extraction. All these factors negatively affect oil output at the upstream level.

The current local content policy is another source of problems. Despite the validity of such policy as an essential means to develop a robust industry of national suppliers to the overall benefit of the country, it has been applied in a way that overburdens production at the upstream level, without showing significant signs of contributing to the effective development of a vigorous long-lasting local industry.

Because of its exclusivity in pre-salt basins and in areas deemed strategic, Petrobras will be particularly affected by the drawbacks of such policy. Part of these costs, however, will be borne by the Federal Government, since a portion of the company’s expenses in case of commercial discovery can be recouped via cost in oil, according to article 6 of Law

⁶⁸⁹ Ibid. 19,20.

12,351.⁶⁹⁰Local content policy's main problem is the lack of focus and the fact that it does not contemplate any phasing-out strategy or shows signs of being limited in time.

Finally, the lack of competition and pricing policies will also affect production. While in the first case Petrobras' de facto monopolistic condition will lead it to lose competitive references, affecting its dynamism and, therefore, its future output, in the second one it causes a shift in the company's resources from the more productive upstream sector to the less lucrative and vigorous downstream segment.

The shortcomings presented in this chapter are particularly troublesome because, as argued in the introduction, production is a variable that directly affects all other studied parameters. Hence, if the production prospects are not favourable, technology-innovation, investments and the strategic control of oil will inevitably incur the negative consequences of such shortfalls.

⁶⁹⁰ These provisions establish that contractor companies can appropriate the cost in oil in these instances. Article, 2, II of the statute, defines cost in oil as the: "portion of oil production, by-products and other fluid hydrocarbons required only in event of commercial discovery, corresponding to costs and investments carried out by the contractor in the execution of the activities of exploration, evaluation, development, production and decommissioning of the facilities, subject to restrictions, terms and conditions to be established by contract;"

Brazil has been successful in developing a national oil company with leading technological and innovation standards in deep water oil exploration. As demonstrated in previous chapters, this achievement has been the result of well-designed public policies since the company's creation, in 1953.⁶⁹¹ Certain critical moments have been decisive in this success story. The corporate decision in the 1970s to concentrate on upstream activities is an example;⁶⁹² the resolution to launch offshore exploration after coming to the conclusion that onshore prospects in the country were limited and scarce, is another.⁶⁹³ This chapter's main goal is to examine how the 2010 changes in the Brazilian regulatory oil framework affect technology and innovation in this sector, responding to the central question if it can be considered another positive milestone.

All industries face crucial moments when strategic decisions alter their structure, considerably affecting thereafter their growth patterns and performance levels. The strategic deliberations in these critical instants have enduring long-term impacts. They differ from the daily business decisions with short-term repercussions of brief cyclical effects. To use former President Fernando Henrique Cardoso's metaphor, it is the difference between choosing what to have for dinner and deciding whom to marry.⁶⁹⁴ The change of the 2010 regulatory framework is one of these important moments that will certainly have substantial long-term consequences for technology and innovation in the Brazilian oil sector.

The next sections will demonstrate how the new framework will have detrimental effects on technology and innovation in this sector. The shortcomings essentially derive from four of its aspects: i) the operational exclusivity; ii) the governance structure of the operational

⁶⁹¹ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010).

⁶⁹² Ibid. 225.

⁶⁹³ During that time, as described in previous chapters, main public policies related to the oil sector were discussed and adopted by the national oil company, since it was then a totally owned state enterprise with monopoly in the oil and gas sector.

⁶⁹⁴ Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013).

committee; iii) local content policies which lack adequate focus and strategic planning; and iv) financial resources. All these elements actually stem from an excessively intrusive regulatory approach, within a typical top-down model, disproportionately reliant on command and control procedures. As will be demonstrated, the Brazilian oil sector requires more versatile and flexible regulations that respond to a changing and dynamic environment, with increasingly diverse stakeholders. A less intrusive regulatory framework, based on reflexive and responsive regulations is more suitable in this context, since it induces agents to continuously interact in a favourable way for the intended outcomes, instead of imposing norms and rules on them that most probably lead to other undesirable consequences.⁶⁹⁵

8.1 TECHNOLOGY AND INNOVATION IN THE OIL SECTOR

Chapter 5 has already demonstrated that the oil sector is highly capital intensive and that technology and innovation account for a great part of the capital expenditures in the segment. One of the main reasons for this feature is that oil companies' stock values depend on the levels of booked reserves they own. Corporations are therefore constantly in search of new production areas to replace the old and less productive ones, with high depletion rates. Since most of the easier to explore petroleum reserves with lower costs are already under exploitation, the exploration frontier is currently located in areas with difficult access, which demand more intensive levels of technology to be able to produce at a reasonable and profitable cost.⁶⁹⁶

Another feature of the upstream oil industry is a progressive technological specialisation of the different stakeholders.⁶⁹⁷ This process has led to a greater interdependence

⁶⁹⁵ Cf. Gunther Teubner, *Law as an autopoietic system* (Oxford/Cambridge, Blackwell Publishers 1993) and Ian Ayres and John Braithwaite, *Responsive regulation : transcending the deregulation debate* (Oxford University Press 1992).

⁶⁹⁶ Cf. Nadine Bret Rouzaut and Jean Pierre Favennec, *Petóleo & Gás Natural: Como Produzir e a que Custo* (Synergia 2011) and Helder Queiroz Pinto Jr and Mariana Iooty, 'Perspectivas de Desenvolvimento do Setor Petróleo e Gás no Brasil' (2010) 55 *Serie Eixos do Desenvolvimento Brasileiro*.

⁶⁹⁷ Nadine Bret Rouzaut and Jean Pierre Favennec, *Petóleo & Gás Natural: Como Produzir e a que Custo* (Synergia 2011) 204.

among them and to increasing levels of operational outsourcing.⁶⁹⁸ The next sections will demonstrate the prevailing tendency in the oil sector towards the formation of new governance structures with several stakeholders holding greater expertise.⁶⁹⁹

Institutional economics claims that on occasions of bounded rationality, uncertainty and divergent interests, firms have a tendency to coordinate their interactions to minimise transaction costs.⁷⁰⁰ Institutional scholars cite two paradigmatic governance structures that prevail according to the existing transaction costs in the coordination between firms: markets and hierarchy. While the first modality tends to be used when products are relatively standardised, economies of scale relevant and monitoring costs of suppliers considered low, the opposite happens in the second case. Hence, when the supplied product becomes customised and specific to the buyer's need and monitoring of the supplier's goods is required, transaction costs increase and so does the likelihood of vertical integration of firms, in a typical hierarchical market organisation form. On the other hand, when monitoring is not necessary, goods relatively standard and the suppliers abundant, transaction costs are deemed low and firms are more likely to use the market for their negotiations.

More recent institutional scholarly research has added two other coordination forms to the previously mentioned ones, which stand in a mid-way position between markets and hierarchy, according to the degree of control of the buyer over its supplier and the inherent

⁶⁹⁸ Cf. Virginia Acha and Lucia Cusmano, 'Governance and co-ordination of distributed innovation processes: patterns of R&D co-operation in the upstream petroleum industry' (2005) 14 *Economics of Innovation and New Technology* 1, 6; James G Crump, 'Strategic alliances fit pattern of industry innovation' (1997) 95 *Oil and Gas Journal* 59 referred in Virginia Acha and Lucia Cusmano, 'Governance and co-ordination of distributed innovation processes: patterns of R&D co-operation in the upstream petroleum industry' (2005) 14 *Economics of Innovation and New Technology* 1 6; and Nadine Bret Rouzaut and Jean Pierre Favennec, *Petóleo & Gás Natural: Como Produzir e a que Custo* (Synergia 2011).

⁶⁹⁹ Cf. Virginia Acha and Lucia Cusmano, 'Governance and co-ordination of distributed innovation processes: patterns of R&D co-operation in the upstream petroleum industry' (2005) 14 *Economics of Innovation and New Technology* 1 6 and James G Crump, 'Strategic alliances fit pattern of industry innovation' (1997) 95 *Oil and Gas Journal* 59 referred in Virginia Acha and Lucia Cusmano, 'Governance and co-ordination of distributed innovation processes: patterns of R&D co-operation in the upstream petroleum industry' (2005) 14 *Economics of Innovation and New Technology* 1, 6.

⁷⁰⁰ Cf. Oliver E Williamson, 'Markets and hierarchies' (1979) 22 (2) *Journal of law and economics* 26; Oliver E Williamson, 'Transaction-cost economics: the governance of contractual relations' (1979) *Journal of law and economics* 233-261; and John Humphrey and Hubert Schmitz, 'How does insertion in global value chains affect upgrading in industrial clusters?' (2002) 36 *Regional studies* 1017.

transaction costs of the operations.⁷⁰¹ The first one, called quasi-hierarchy, takes place in situations when the buyer still considers the transaction costs quite significant but not as high to justify a vertical integration. Therefore, he employs his bargaining power to exert strict control over his suppliers, detailing the features of the products he will need and defining specific standards to be followed. In the second one, labelled as networks - or quasi-market for some authors⁷⁰²- suppliers and buyers are dependent on one another and in close cooperation for the development of the provided products. Quasi-hierarchy coordination tends to occur when the client is in a dominant position with respect to his supplier and has questions regarding his competence, reason why he exerts strict monitoring and control over his activities. This stricter oversight increases transaction costs. In networks, on the other hand, supplier and buyer tend to have rather similar bargaining power and the client has confidence in the quality of the supplied products. Since monitoring and tight control are not necessary, transaction costs diminish accordingly. The market is not used in this specific case because the nature of the supplied products requires close interaction between agents, especially for information exchange. This type of coordination tends to prevail in highly technological sectors.

Acha and Cusmano when analysing the oil sector in the North Sea demonstrate that there has been a process of outsourcing of technological operations taking place in the region, in a progressive shift from hierarchical governance structures to a “quasi-market” architecture.⁷⁰³ They show that service and supply firms in the oil sector have been increasingly assuming control over the coordination of the supply chain, mitigating the otherwise hegemonic position of the upstream oil companies in the command of technology and innovation throughout the industry. These service and supply firms such as Norske Veritas and Stolt Comex Seaway are providers of integrated solutions for the upstream companies and are replacing previous relationships based on a multitude of companies with narrower specialised know-how and technical expertise directed towards the upstream client. The new governance structure in the

⁷⁰¹ John Humphrey and Hubert Schmitz, ‘How does insertion in global value chains affect upgrading in industrial clusters?’ (2002) 36 *Regional studies* 1017, 1023.

⁷⁰² Virginia Acha and Lucia Cusmano, ‘Governance and co-ordination of distributed innovation processes: patterns of R&D co-operation in the upstream petroleum industry’ (2005) 14 *Economics of Innovation and New Technology* 1.

⁷⁰³ Ibid.

North Sea is consistent with the theoretical framework presented in previous paragraphs. The rising importance of suppliers, the increase in their technological standards, the progressive reliance on their performance and the gradual reciprocal dependency between them and upstream firms are conducive to network relationships or quasi-market interactions.

The situation of the Brazilian oil sector is quite different in technological governance terms, when compared to the North Sea experience described by Acha and Cusmano. In Brazil there is a neat and widespread predominance of the upstream firm, Petrobras, throughout the industry. The Brazilian national oil company actually controls and commands the whole technological supply chain, exerting a position of clear hegemony.⁷⁰⁴ Therefore, the governance architecture for technology and innovation in the Brazilian oil sector is based on a quasi-hierarchical model, since the leading firm exerts strict and close control over its suppliers, centralising the supply chain according to its specific needs.

As demonstrated by Humphrey and Schmitz when analysing coordination mechanisms in global value chains, companies inserted in quasi-hierarchical governance structures are more likely to upgrade their products, shifting to better and more sophisticated goods.⁷⁰⁵ Firms in networks, on the other hand, tend to reveal more facility to upgrade functionally, in a process whereby they incorporate or acquire distinct functions in higher value activities, increasing their overall expertise. The authors point to a specific limitation of the quasi-hierarchy coordination model, which actually represents one of its dilemmas, or a “two-edged sword” as they label it. While quasi-hierarchical models effectively assist supply companies to gain access to new and dynamic markets to which they probably would not have access if unassisted, they

⁷⁰⁴ Cf. Adilson De Oliveira and Diana Rubiano, ‘Innovation in Brazilian oil industry from learning by using to prospective capacity to innovate the technical frontier’ Observatorio de Política Estratégica de Produção e Inovação no Brasil <<http://www.redesist.ie.ufrj.br/p14-resultados/p14-artigos-publicados>> accessed 1 July 2015; Eduardo Augusto Guimaraes, ‘Política de Conteúdo Local na Cadeia de Petróleo e Gás: Uma visão sobre a evolução do instrumento e a percepção das empresas investidoras e produtoras de bens’ (A Indústria e o Brasil, 2012); and Eduardo Augusto Guimaraes, ‘Uma avaliação da política de conteúdo local na cadeia do petróleo e gás’ in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013).

⁷⁰⁵ Cf. John Humphrey and Hubert Schmitz, *Governance and upgrading: linking industrial cluster and global value chain research*, vol 120 (Institute of Development Studies Brighton 2000) and John Humphrey and Hubert Schmitz, ‘How does insertion in global value chains affect upgrading in industrial clusters?’ (2002) 36 *Regional studies* 1017.

also limit their possibilities in diversifying their client base, leaving them often tied to a group of powerful buyers.⁷⁰⁶

To illustrate their point Humphrey and Schmitz contrast the experience in the Brazilian shoe sector at the Sinos Valley with the electronic manufacturers in Taiwan. In Brazil, shoe suppliers of the Sinos Valley reaped the advantages of being part of the prosperous American shoe business in the 1980's. In return for this facilitated access to their dynamic market, American clients would specify the standards, develop the models, oversee and control the quality and chose the technology and production model that the Brazilian suppliers would have to follow. In the 1990's these Brazilian firms progressively lost their place in the prosperous American footwear value chain to Chinese producers, who were able to supply the US market at better prices. Since the dependence of Brazilian companies upon American clients was very high, the industry declined as it lost market share to Chinese competitors. It has been unable to adequately recover since then. In sharp contrast with this case, in the Taiwanese electronic sector, suppliers were able to replicate production improvements for one customer to other ones, diversifying their expertise and increasing their client base and bargaining power.⁷⁰⁷ As a result, they did not remain captive to one sole big and dynamic client. They were able to diversify further their activities towards functions of higher added value and technological complexity.

To a great extent one of the limitations of quasi-hierarchical governance structures is that lock-in effects tend to be more present for supplier companies in these settings and more difficult to eliminate. This happens because of the often high dependence of vendor companies on their clients in this governance model, such as in the example of the Sinos Valley in Brazil.

Lock-in effect is a concept linked to the theory of path-dependence of technological innovations. The development of the idea in Economics had the important contribution of Paul David, whose work has demonstrated how knowledge in one specific moment is extremely

⁷⁰⁶ Cf. John Humphrey and Hubert Schmitz, *Governance and upgrading: linking industrial cluster and global value chain research*, vol 120 (Institute of Development Studies Brighton 2000).

⁷⁰⁷ Ibid. 1024.

dependent on events of the past that actually limit the available technological options for the future.⁷⁰⁸ Hence, after adhering to a certain technological path, investing in it and creating strict and rigorous industrial routines that considerably affect the future creation of knowledge, companies remain locked-in this specific development track. Technology at a certain moment in time is therefore strictly dependent on and determined by past experiences and choices. Paul David analysed the lock-in concept through the study of the keyboard standard QWERTY of letter ordering. He claims that despite not being the ideal layout format for keyboards this model has persisted throughout time because of its adoption as a standard model in the past, which has been widely replicated afterwards.⁷⁰⁹ Hence, nowadays all computers still use the very same keyboard model simply because it has been adopted as a standard in the past and the switching cost for users is significantly high.⁷¹⁰

Against this backdrop, one of the greatest challenges of quasi-hierarchical coordination models is for supplier companies to avoid lock-in effects, so they can successfully diversify their client base, attempting to evolve towards a network model and promote functional upgrading of their activities in the future. Humphrey and Schmitz demonstrate that this shift is perfectly possible because governance is a dynamic process and supplier firms in quasi-hierarchical coordination structures are able to develop new capabilities and increase their bargaining power in relationships with their clients. That is what actually happened with the Taiwanese electronic sector, mentioned above. Moreover, the continual maintenance of quasi-hierarchical governance architectures is costly for clients, so in theory they also have an interest that their providers evolve towards new coordination relationships in the future. One effective strategy pointed out by Humphrey and Schmitz for supplier companies in quasi-hierarchical structures is that they assume functions that their clients are eager to abandon so they can focus on their

⁷⁰⁸ Paul A David, 'Clio and the Economics of QWERTY' (1985) *The American economic review* 332.

⁷⁰⁹ *Ibid.*

⁷¹⁰ This conclusion has been criticised by Liebowitz and Margolis, who claim that the empirical evidence does not support the claim that QWERTY is inferior to other standards. Cf. Stan J Liebowitz and Stephen E Margolis, 'The fable of the keys' (1990) *Journal of law and economics* 1.

core-business. That is what happened in the North Sea, according to Acha and Cusmano.⁷¹¹ Humphrey and Schmitz demonstrate that one of the critical elements for firms to upgrade to other governance settings is the existence of strategic intent.⁷¹² They show that this strategic intent ought to be used to replicate acquired corporate knowledge in supplying other smaller markets that can be progressively extended and widened afterwards.

As will be argued below, the current Brazilian legislation for the oil sector imposes severe restrictions for firms to evolve from the current quasi-hierarchical governance structure, revolving around Petrobras, towards a network architecture, where companies stand at more equal levels of bargaining power and in joint collaboration for the development of higher levels of technology and innovation. One of the starkest limitations is the current local content policy, which instead of fostering elements for supplier firms to evolve towards new functions and clients, reinforces, instead, their dependency towards Petrobras. The next sections will demonstrate that the current regulatory oil framework in Brazil does not encourage stakeholders to form and develop dynamic network governance structures that contribute to future technological upgrading.

As the network governance structure is particularly more conducive to activities of higher added value, likely to incorporate greater technological standards, the literature on technology and innovation has been recently focusing on the importance of forming these networks for the acquisition and transfer of technology.⁷¹³ Within this setting, scholarly research on “national innovation systems” claims that technological innovations do not

⁷¹¹ Virginia Acha and Lucia Cusmano, ‘Governance and co-ordination of distributed innovation processes: patterns of R&D co-operation in the upstream petroleum industry’ (2005) 14 *Economics of Innovation and New Technology* 1.

⁷¹² Cf. John Humphrey and Hubert Schmitz, ‘How does insertion in global value chains affect upgrading in industrial clusters?’ (2002) 36 *Regional studies* 1017; Michael Hobday, *Innovation in East Asia: the challenge to Japan* (Edward Elgar Aldershot 1995), referred in John Humphrey and Hubert Schmitz, ‘How does insertion in global value chains affect upgrading in industrial clusters?’ (2002) 36 *Regional studies* 1017, 1024; and Chikashi Kishimoto, ‘The Taiwanese personal computer cluster: trajectory of its production and knowledge systems’ (University of Sussex 2002), referred in John Humphrey and Hubert Schmitz, ‘How does insertion in global value chains affect upgrading in industrial clusters?’ (2002) 36 *Regional studies* 1017.

⁷¹³ José Benedito Ortiz Neto, ‘O processo de aprendizado tecnológico na trajetória do sistema de produção flutuante empreendido pela Petrobrás em seu programa de capacitação tecnológica em águas profundas-PROCAP’ (Dphil Thesis, Universidade Federal do Parana 2006) 20 mentions that the economic neo-Schumpeterian literature has been concentrating on this topic.

exclusively depend on firms that introduce original products in the market. They also require the intensive participation of other institutions.⁷¹⁴ Three specific organisations are particularly relevant in this process of creation and diffusion of knowledge: academia, industry and the government.⁷¹⁵ Studies focusing on the interactions among and between these institutions mention the importance of forming a dynamic and interactive model of cooperation between them in a process which has been labelled as a “Triple Helix”.⁷¹⁶

Hatakenaka when comparing the dynamics of innovation in the Norwegian oil sector and in the United Kingdom demonstrates that both countries have developed triple helix industrial formations.⁷¹⁷ Yet while in the former case there has been a strong supporting and steering role exerted by federal and local governments, using inputs coming from research centres and universities, the process in the latter has been rather market driven, with less governmental interference. This difference in the innovation settings in both countries has shaped their current technological and innovation standards in different manners. Therefore, whilst the oil cluster in Aberdeen, Scotland reveals comparative advantages in terms of operational costs and production processes, the hub in Stavanger, Norway, is more competitive in the introduction and development of new technologies.⁷¹⁸

There is some initial evidence demonstrating that a cluster might be forming around the city of Rio de Janeiro, Brazil, with the presence of triple helix model involving Petrobras, local

⁷¹⁴ Cf. Richard R Nelson, ‘National innovation systems: a comparative analysis’ (1993) University of Illinois at Urbana-Champaign’s Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship; Bengt-Ake Lundvall, *National innovation system: towards a theory of innovation and interactive learning* (Pinter 1992); and Christopher Freeman, ‘Technology policy and economic performance: lessons from Japan’ (1987) cited in Sachi Hatakenaka and others, ‘The regional dynamics of innovation: A comparative study of oil and gas industry development in Stavanger and Aberdeen’ (2010) 3 International Journal of Innovation and Regional Development 305.

⁷¹⁵ Cf. Loet Leydesdorff and Henry Etzkowitz, ‘The triple helix as a model for innovation studies’ (1998) 25 Science and public policy 195 and Loet Leydesdorff, ‘The Triple Helix Model and the study of Knowledge Based Innovation Systems’ (2005) 42 International Journal of Contemporary Sociology 1.

⁷¹⁶ Cf. Loet Leydesdorff and Henry Etzkowitz, ‘The triple helix as a model for innovation studies’ (1998) 25 Science and public policy 195 and Loet Leydesdorff, ‘The Triple Helix Model and the study of Knowledge Based Innovation Systems’ (2005) 42 International Journal of Contemporary Sociology 1.

⁷¹⁷ Sachi Hatakenaka and others, ‘From ‘Black Gold’ to ‘Human Gold’ (Local Innovation Systems Project: LIS Working Paper 06-002, 2006).

⁷¹⁸ Sachi Hatakenaka and others, ‘The regional dynamics of innovation: A comparative study of oil and gas industry development in Stavanger and Aberdeen’ (2010) 3 International Journal of Innovation and Regional Development 305.

service and supplier companies and the Federal and State Universities of Rio de Janeiro.⁷¹⁹ While the region holds adequate conditions to develop an exploration hub for oil in close connection with academia and other important stakeholders, as will be further detailed, Brazilian regulations impose serious limitations on these grounds.⁷²⁰

The Brazilian triple helix path is certainly closer to the model used in Norway, with defined steering functions proactively exerted by the government in close collaboration with research centres and universities. Yet the approach used in Brazil exaggerates in its state intrusiveness and in the stiff rigidity of its requirements, rules and norms, leading to significant shortcomings in a segment that is essentially dynamic and mutable. Before considering these limitations in the next section, the analysis will turn to Petrobras' innovation policy.

8.1.1 TECHNOLOGY AND INNOVATION IN PETROBRAS

Petrobras' innovation policy has shifted several times since its creation in 1953. In its first years the company directed almost all its technological efforts towards the downstream sector. Since prospects for discovering onshore oil in the country were scarce and the availability of private investors reduced, because of plunging oil prices, the rationale was to remove Brazil's significant dependence on oil derivatives imports for its development strategies.⁷²¹ The company received substantial government support for its endeavours and autonomy to develop projects. It built refineries and exerted close oversight on the construction of the necessary infrastructure for fuel supply in the country.⁷²² Since its early years Petrobras also invested substantially in the qualification of its workforce, sending staff to study abroad and also hiring international specialists to provide technical support and advice whenever required. Moreover, the company has always promoted close cooperation with local

⁷¹⁹ Cf. José Mauro de Moraes, *Petróleo em águas profundas: uma história tecnológica da PETROBRAS na exploração e produção offshore* (IPEA 2013); and Carlos Eduardo Lopes da Silva, Ramon Baptista Narcizo and Rodolfo Cardoso, 'The proximity between Academy, Industry and Government: towards a more sustainable development of a Brazilian oil region' (2012) 52 *Procedia-Social and Behavioral Sciences* 100.

⁷²⁰ See discussions below.

⁷²¹ Adilson De Oliveira, 'Oil and governance: state-owned enterprises and the world energy supply' in David Victor, David Hults and Thurber (eds), *Oil and Governance* (Cambridge University Press 2012).

⁷²² *Ibid.*

universities, stimulating them to offer specialised courses for the corporation's needs such as geology and chemical engineering.

At the end of the 1960's the newly appointed President of the company, General Geisel, who later became President of the Republic, tacitly announced a shift in the company's focus towards the upstream segment. He declared in his inaugural speech that the corporation's priority would thereafter be to "guarantee the domestic supply of oil products".⁷²³ The statement implied that Petrobras would seek to minimise its import dependency upon crude and search for the product wherever it was most likely to be found, be it offshore, or even abroad. Soaring oil prices after the first oil shock, in 1973, impelled the company further in this quest for large oil reserves as a response to the significant upsurge of national trade deficits due to rocketing crude imports to sustain the national industrialisation programme. As part of this strategy General Geisel created a subsidiary company, Braspetro, with the main objective of seeking international oil reserves.

The development strategy for the oil sector actually followed closely the country's economic policy.⁷²⁴ Instead of limiting its investments and expenses due to the budgetary constraints and growing trade deficits of the 1970s after the first oil shock, Brazil did the opposite, increasing its capital expenditures to build a solid industrial structure and mitigate the excessive dependency on imports in the future. Hence, the strategy was mainly focused on the long term, aiming at building economic structures of high added value for the Brazilian economy. In the oil sector, similarly, eliminating national constraints and the excessive expenditures with oil imports meant going offshore and abroad, as well as developing new technological standards to build a solid industry for the exploitation of new petroleum frontiers. The economic plan therefore hinged on intense investments for industrial development, taking advantage of cheap petrodollars in the international financial market and aiming at reducing the import dependency of the country on industrialised goods and oil.

⁷²³ Ibid. 525.

⁷²⁴ Cf. Chapter 2.

The decision to explore a new and unknown region, full of technological challenges in Brazil's offshore region demanded a stark change in the innovation policy followed until then by Petrobras. From a strategy based on the assimilation and importation of existent worldwide technical expertise, the company moved to insource development of a new programme to be able to exploit deep water offshore oil: PROCAP 1000.⁷²⁵ The project's goal was to advance the necessary technology for oil exploitation in depths of 1000 metres beneath the ocean floor. Essential, in this respect, was the existence of previous expertise and accumulated knowledge in offshore areas, which had been developing at CENPES, a research centre created in 1966 for the development and assimilation of technological expertise in the oil sector. CENPES was responsible for coordinating PROCAP 1000.

The new programme in deep water exploration also took advantage of an important previous shift in CENPES' competences from the downstream, according to Petrobras' initial strategies, to the upstream, following the new orientation. Another relevant alteration took place in the research centre's posture towards technology and innovation. Differently from the standpoint carried out until then, in which CENPES mainly assimilated and incorporated existing techniques, the move to a new and unexplored frontier in deep waters called for the creation and development of new technologies. This modification represented an essential milestone in the company's technological history that significantly shaped its future thereafter. It actually meant the first step towards the development of insource independent technology.⁷²⁶

⁷²⁵ Cf. José Benedito Ortiz Neto, 'O processo de aprendizado tecnológico na trajetória do sistema de produção flutuante empreendido pela Petrobrás em seu programa de capacitação tecnológica em águas profundas-PROCAP' (Dphil Thesis, Universidade Federal do Paraná 2006); Adilson De Oliveira and Diana Rubiano, 'Innovation in Brazilian oil industry from learning by using to prospective capacity to innovate the technical frontier' Observatorio de Política Estratégica de Produção e Inovação no Brasil <<http://www.redesist.ie.ufrj.br/p14-resultados/p14-artigos-publicados>> accessed 1 July 2015; Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010); Adilson De Oliveira, 'Oil and governance: state-owned enterprises and the world energy supply' in David Victor, David Hults and Thurber (eds), *Oil and Governance* (Cambridge University Press 2012) and José Mauro de Moraes, *Petróleo em águas profundas: uma história tecnológica da PETROBRAS na exploração e produção offshore* (IPEA 2013).

⁷²⁶ Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010).

The move to offshore limits was uncertain and risky, especially taking into account the international economic environment of stagflation, the country's growing trade deficit and foreign debt that followed in the 1980s. The effort required essential governmental support and tenacity to overcome the cyclical problems without losing track of the stipulated strategic goals. This persistence became quite relevant when oil prices stumbled in the counter oil shock of the 1980's. First, because it made recoupment of the significant investments more difficult and costly; second, due to the widespread urge to minimise production costs. Felipe⁷²⁷ and Oliveira⁷²⁸ show how this governmental support did not falter even in a context of fiscal constraints and scarce foreign reserves. While investment in most state-owned Brazilian companies dropped significantly, Petrobras maintained its capital expenditure level, which denotes its strategic relevance for the country.

Based on this governmental support Petrobras successfully concluded PROCAP 1000. Subsequent projects followed with the same goal of producing at increasingly higher depths. Against this backdrop came PROCAP 2000 and PROCAP 3000, respectively aiming at being able to successfully tap oil at 2000 and 3000 metres beneath the ground sea level.⁷²⁹ The discovery of the pre-salt region and the effective exploitation of the area, which requires drilling 5,000 metres beneath the ground sea level and passing through 2,000 metres of thick salt formations,⁷³⁰ are clear signs of the company's effective grip over deep water drilling technology that followed from all these programmes.

Yet the development of this new gigantic oil region opens new technological and innovation challenges for Petrobras. In spite of the company's unquestionable accomplishments

⁷²⁷ Ibid.

⁷²⁸ Adilson De Oliveira, 'Oil and governance: state-owned enterprises and the world energy supply' in David Victor, David Hults and Thurber (eds), *Oil and Governance* (Cambridge University Press 2012)

⁷²⁹ Cf. José Mauro de Moraes, *Petróleo em águas profundas: uma história tecnológica da PETROBRAS na exploração e produção offshore* (IPEA 2013); Adilson De Oliveira and Diana Rubiano, 'Innovation in Brazilian oil industry from learning by using to prospective capacity to innovate the technical frontier' Observatorio de Política Estratégica de Produção e Inovação no Brasil <<http://www.redesist.ie.ufrj.br/p14-resultados/p14-artigos-publicados>> accessed 1 July 2015; and Rabah Arezki and others, *Beyond the curse policies to harness the power of natural resources* (International Monetary Fund, 2011).

⁷³⁰ International Energy Agency (IEA), 'World Energy Outlook 2013' (2013)316.

and its leading worldwide know-how in deep-water exploitation, it still has some limitations that hinder further developments.

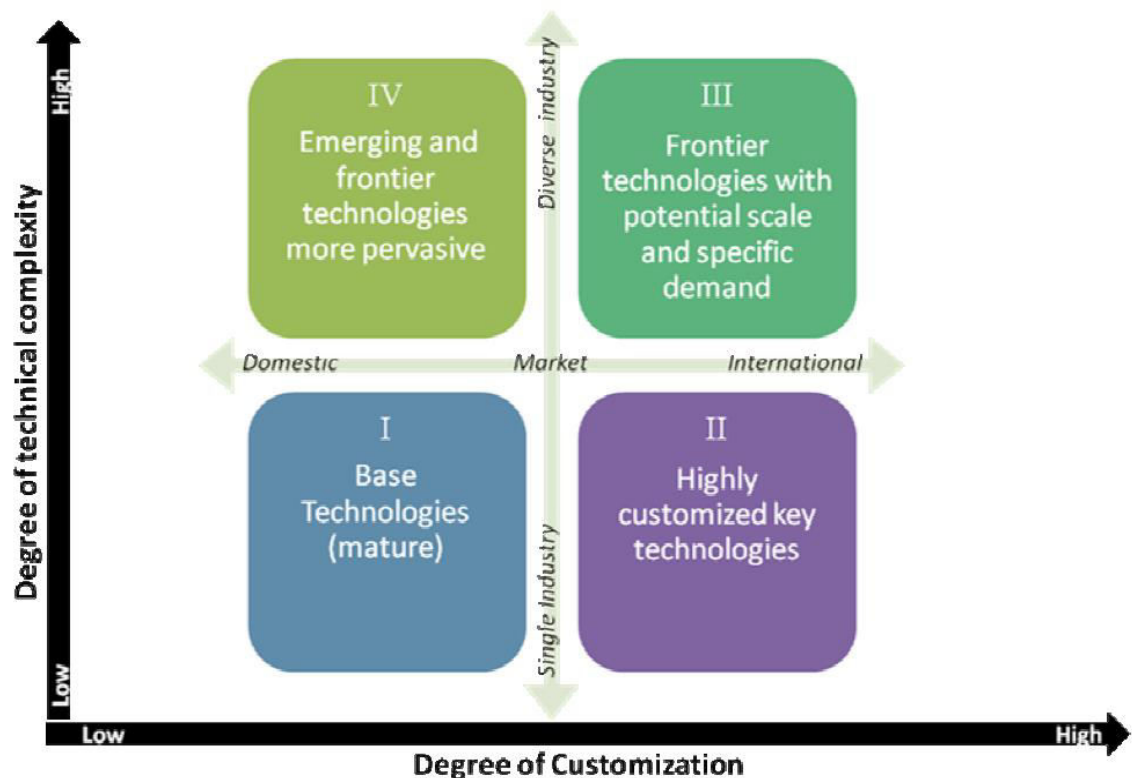
One first aspect that has been pointed out by Oliveira and Rubiano is the technological disparity between Petrobras and its supplier and service firms operating in Brazil.⁷³¹ This discrepancy has been imposing significant transaction costs on the Brazilian national oil company. The transaction costs result from the close monitoring and control that Petrobras has to exert over providers so they can meet their quality standards. This requirement also explains, as previously mentioned, why the Brazilian governance structure operates according to a quasi-hierarchical model with a clear and overwhelming presence of Petrobras.

Analysing further Petrobras' innovation policy, Oliveira and Rubiano classified equipment and services used by the company according to their degree of customisation and technical complexity, as shown below in figure 3.⁷³²

⁷³¹ Adilson De Oliveira and Diana Rubiano, 'Innovation in Brazilian oil industry from learning by using to prospective capacity to innovate the technical frontier' Observatorio de Politica Estrategica de Producao e Inovacao no Brasil <<http://www.redesist.ie.ufrj.br/p14-resultados/p14-artigos-publicados>> accessed 1 July 2015.

⁷³² Ibid.

Figure 3: Technological Dimensions of Supplied Services and Equipment to Petrobras



Source: De Oliveira A and Rubiano D, 'INNOVATION IN BRAZILIAN OIL INDUSTRY' 12

Four different possible quadrants can be depicted, according to the provision of services and equipment to Petrobras. The first quadrant represents mature technologies of widespread applicability across different sectors. The second one stands for specific technologies of low complexity. The third quadrant portrays provisions of services and equipment involving radical innovations specific to the oil sector, whilst the fourth one shows materials and services of high technological standards that can be used in different segments.⁷³³

Oliveira and Rubiano demonstrate that Petrobras has rightly concentrated its innovation policy cooperation with firms located in the second and third quadrants, to maximise corporate benefits while minimising costs. Most of the corporations portrayed in these quadrants are multinationals.⁷³⁴ Despite the accomplished technological improvements in

⁷³³ Ibid. 13.

⁷³⁴ Ibid. 16.

the relationships between Petrobras and its suppliers so far, Oliveira and Rubiano show that most of the achievements are still excessively reliant on the passive incorporation of expertise through “learning by using” strategies of imported utensils and appliances.⁷³⁵ According to them, the Brazilian national oil company is disproportionately dependent on foreign innovative equipment provided by corporations that are not part of any strategic alliance. Even worse, however, these companies’ provisions cannot be accounted for as local content purchases. Therefore, one of the most dynamic and prosperous commercial links for technology and innovation in Petrobras’ acquisitions are not contemplated in the current national content policies. The absence of this technologically vigorous sector in the main governmental policy to develop the Brazilian oil industry of suppliers can dangerously affect the future prospects of innovation in the oil industry, as will be further detailed.⁷³⁶

The most rewarding quadrant in terms of added value is the third one, which stands at the frontier of technological development and hinges on radical innovations of direct applicability to the oil sector. Corporate relationships at this level require a significant degree of risk sharing. According to Oliveira and Rubiano, Petrobras has hitherto engaged in projects of risk sharing with domestic providers that are excessively focused on the company’s own specificities and particular requirements.⁷³⁷ This feature has exacerbated the suppliers’ dependence on the national oil company and limited their future international expansion. As previously mentioned, one of the restrictions of the quasi-hierarchical governance setting is the tendency to create lock-in effects from a disproportionate dependence on a single client. This is exactly the problem in this case. Oliveira and Rubiano rightly contend that strategies to increasingly move the industry of suppliers to the third quadrant require a joint participation of these firms, Petrobras and the government in risk mitigation. Yet they have ignored in their analysis considerations about elimination of the lock-in effects, which are an essential constraint for the future technological development of the Brazilian oil industry. As will be further discussed, one of the ways to minimise this limitation is to increasingly foster the

⁷³⁵ Ibid.

⁷³⁶ Ibid.

⁷³⁷ Ibid. 24

formation of joint ventures, operational consortia of firms, encouraging interactions between them and their respective research partners. Unfortunately, the Brazilian regulatory framework is going in the opposite direction, as the remainder of the chapter will demonstrate.

The following sections will now analyse the aspects in the 2010 regulatory framework that will affect technology and innovation in the Brazilian oil sector. The first element to be examined is the operational exclusivity in section 8.1. Section 8.2 will then consider the governance structure of the operational committee, while 8.3 will examine local content policies. Finally, section 8.4 will evaluate the financial resources directed to activities of technology and innovation.

8.2 OPERATIONAL EXCLUSIVITY

A first aspect that is a direct consequence of the operational exclusivity with negative effects in terms of innovation is the excessive concentration of Petrobras' tasks in one region and the process of international divestiture that it entails. As already discussed in previous chapters, these two outcomes result from the operational exclusivity because the company has limited resources for investments and it is the only corporation allowed to operate in the vast pre-salt region, considered a state priority for the future of the Brazilian oil sector. Even though Petrobras can rely on consortium partners to share the required investment onus in this area, it is still legally bound with a minimum 30% participation.⁷³⁸ The disproportionate corporate focus on one domain limits the company's possibility of operating in a diverse range of blocks, with different features and peculiarities. This restriction hinders the greater development and assimilation of a wider range of technologies, making the company's know-how excessively limited to the reality and specificities of one region.

Norway provides a good example of a national oil company operating through joint ventures with other private international companies for the creation of a fruitful environment

⁷³⁸ Article 10, III, (c) of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

for technological innovations.⁷³⁹ Statoil has been forming strategic partnerships with international oil companies since its creation, in 1972. The strategy proved particularly rewarding when the Norwegian oil fields reached the maturity phase, since it facilitated the corporation's international expansion, which was conducted on an already solid existing network of worldwide partnerships. Furthermore, despite these technological advantages, the formation of joint ventures in Norway permitted risk sharing and mitigation of investment burdens.

A constant concern of Norway's oil policy has been the maintenance of several oil companies operating in the country's continental shelf. Different oil locations present their own specific geological and logistic features, which generally require particular know-how and applied expertise. Normally oil companies have their own niches of operation, where they hold competitive advantages in relation to their competitors. A corporation with experience in oil exploitation in the Brazilian sedimentary basin is not necessarily the best firm to operate in the Gulf of Mexico, for example. Therefore, by having several companies operating in the country the Norwegian government maximised the probability of finding the best match for each oil block's features. In striking contrast with the Norwegian experience, the Brazilian 2010 regulations excessively limit the effective use of the worldwide existing technology because of Petrobras' mandatory operational exclusivity in pre-salt domains and areas considered to be strategic.

Petrobras' international divestments, especially in the Western African Coast,⁷⁴⁰ are also particularly troublesome. Innovation and technological leadership in the oil industry arise not only from the control of pioneering technology but also from its effective application to very peculiar local conditions, which vary according to geological and geophysical peculiarities. The

⁷³⁹ See discussions in chapter 4.

⁷⁴⁰ Cf. Petrobras, 'Esclarecimentos sobre a formação de Joint Venture para atuação na África' <<http://www.petrobras.com.br/fatos-e-dados/esclarecimentos-sobre-a-formacao-de-joint-venture-da-petrobras-para-atuacao-na-africa.htm>> accessed 15 June 2015; and Diego Escosteguy and others, 'O feirão da Petrobras' *Epoca* (28 March 2013) <<http://revistaepoca.globo.com/tempo/noticia/2013/03/empresas-da-petrobras-vendidas-pela-metade-do-preco-um-amigo-de-cristina-kirchner.html>> accessed 10 January 2015.

Western African Coast is deemed to have similar geological formations to the Brazilian Equatorial Basin, considered by specialists the next national exploration frontier. The control and command of technology for exploitation in these areas in Africa could not only allow Petrobras to move in the future to the Brazilian Equatorial Basin with reduced costs, but would also enable it to retain an important international presence in a promising area. This international exposure could confer on the company extremely useful leverage in the future, facilitating expansions abroad once the Brazilian sedimentary basin attains its maturity phase.

Oil companies also hold different levels of expertise, built according to the places where they operate. Their cooperative interaction allows them to share experiences, methods, procedures and technologies when confronted with diverse problems. This technical exchange puts corporations in contact with their different groups of collaborators, such as research centres, suppliers and service firms, opening avenues for new network contacts, prosperous relationships and information interchange. This valuable exchange will be substantially mitigated with Petrobras' operational exclusivity in pre-salt and strategic areas.

Lourdes Casanova et. al in interviews with high-ranking executives and specialists in government agencies and trade associations in Brazil show how they value cooperation between firms as a means of technological improvements.⁷⁴¹ Ten out of sixteen of their interviewees claimed that partnerships between domestic and foreign firms are an important way to access cutting-edge technology. In an interview with the author, Armando Guedes was similarly of the view that joint operations bring technological progress and have been recurrent sources of technological assimilation for the company in the past. Guedes mentions that this collaboration will be significantly reduced with the operational exclusivity.⁷⁴² Mauro Andrade also points out that each company has its own competitive advantages and can aggregate value in certain peculiar fields. Therefore, according to him, the operational exclusivity limits the

⁷⁴¹ Luiz Marcelo Martins Almeida, Luiz Alberto Nascimento Campos filho and Lourdes Casanova, 'The Brazilian Institutional Environment: The Impact on Companies' Strategies in the Oil and Gas Sector' (2011) Faculty and Research Working Paper - INSEAD 22.

⁷⁴² Interview with Armando Guedes, Former President of Petrobras (Rio de Janeiro, 21 July 2012).

attainment of increasingly higher innovation levels since it hinders this functional exchange of experiences.⁷⁴³

Oil specialists outside Brazil also share the opinion. In interviews with Valerie Marcel Abu Dhabi National Oil Company's executives express a clear preference for partnerships that bring together several foreign firms, with access to numerous technologies, instead of a model whereby only one company would be granted operational exclusivity.⁷⁴⁴

Companies tend to invest more in innovation to be able to produce better and cheaper goods so they can reap higher profits, outpacing their competitors. Markets facing lower levels of competition have fewer incentives to invest in technology. Most scholars recognise that the opening of the Brazilian oil sector in 1995 is one of the elements that most contributed to its innovation development⁷⁴⁵ Armando Guedes and Flavio Rodrigues both mentioned in interviews with the author that one of the worst aspects of the 2010 regulatory framework was the limitation it imposed on competition, because of the operational exclusivity, with negative repercussions for technology and innovation.

The operational exclusivity in the Brazilian regulatory oil framework therefore presents substantial downsides from a technological and innovation viewpoint. These shortcomings arise from excessively intrusive regulations, which limit the productive structures of firms interested in holding operations in the Brazilian pre-salt area. Chapter 5 considered the possible justifications for such interventionism. In spite of the possible motives and their reasonableness, what is important to take into account in this chapter is that an excessively invasive regulatory model, irrespective of its goals, normally leads to contradictions, distortions and unintended consequences beyond its aimed target. These divergences are increased furthermore in the oil industry, in view of its shifting and unpredictable nature.

⁷⁴³ Interview with Mauro de Andrade, Vice-President of Statoil (Rio de Janeiro, 08 August 2013).

⁷⁴⁴ Valerie Marcel, *Oil titans* (Brookings Institute 2006).

⁷⁴⁵ Cf. Adriano Pires and others, *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Giambiagi and LUCAS eds, Elsevier Brasil 2013).

8.3 GOVERNANCE STRUCTURE OF THE OPERATIONAL COMMITTEE

The governance structure of the operational committee that is formed to explore pre-salt and strategic areas also poses significant obstacles for technology and innovation in the Brazilian oil sector. According to current regulations, PPSA, the entirely state-owned company, has a 50% share in the committee's decisions, while Petrobras holds a minimum 30% participation.⁷⁴⁶ Therefore, these two institutions jointly amount to 80% of the operational committee, which leaves other oil companies with the remaining maximum 20%.⁷⁴⁷

Companies with such a low share will evidently have less of an incentive to contribute with relevant technology, especially considering that they will have minimal deliberative power at the operational committee. As argued in chapter 5, this decision-making imbalance is reinforced by agency problems arising from the fact that PPSA has a 50% share, despite not contributing capital of any kind.

Oil companies are also discouraged from innovating because they can't hold producing activities. Any corporation aiming to decisively contribute to innovation in pre-salt consortia would therefore have to maintain a rather restricted technological role because of the impossibility of handling and applying technological solutions to the daily operational routine. In some specific circumstances in which they hold superior technical expertise and technological solutions to Petrobras, they will have to hand them to the Brazilian national oil company, which will be responsible for operating them, with high possibility of assimilation and incorporation of the received innovations.

The present setting of the operational committee thus leads to a situation of adverse selection of consortium members in terms of technology and innovation. Companies less likely to contribute with technology and innovation will be the most probable and likely interested

⁷⁴⁶ Article 10, III, (d) and Article 23, sole paragraph of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

⁷⁴⁷ The threshold of 20% is considered to be the maximum level because Petrobras might have a higher share than its mandatory legal minimum level – 30%.

partners under the applicable rules, considering the disincentives established on these grounds in the current regulatory framework.

8.4 LOCAL CONTENT POLICIES

Local content policies in Brazil also present severe limitations for the development of technology and innovation in the oil sector. The problems arise from two of its aspects i) the comprehensiveness and lack of focus; and ii) the excessive dependence on one sole firm, Petrobras.

Chapter 7 argued that Brazilian local content policies in the oil industry do not focus on sectors and products that reveal greater potential to become internationally competitive and that have better conditions to aggregate value to the economy. Instead, they are excessively comprehensive and do not have a clear and transparent objective.⁷⁴⁸ This feature of the Brazilian policy significantly impairs the technological development of sectors with higher innovation potential. These sectors have to compete in local content for an overall share of their clients' purchases with suppliers that are less prone to technological development and some of which will never become competitive. By not prioritising the sectors that can become internationally competitive and that will contribute more to the country's future development through increasing technical expertise, the policy loses the potential to more effectively promote these segments.⁷⁴⁹

The excessive dependency on Petrobras, gives rise to additional shortcomings. The first one is the lock-in effect from the subordination of supplier companies to Petrobras. This dependency that was already acute before 2010, because of the company's high market share in the Brazilian upstream oil sector, increased significantly after the enactment of the new regulatory framework in that year. According to the new regulations Petrobras will be the only

⁷⁴⁸ Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013).

⁷⁴⁹ Ibid. 337.

upstream oil client in pre-salt and strategic areas.⁷⁵⁰ These areas are supposed to become the most dynamic producer regions in the country. As already mentioned, governance structures excessively reliant and focused on one client reduce the opportunities for provider firms to functionally upgrade to activities of increasing added value, with higher technological levels. Moreover, for Petrobras itself, these structures impose significant transaction costs. These result from the obligation to purchase services and equipment that are normally of higher cost and lower quality, but also from the monitoring activities that the national oil company has to frequently perform to ensure compliance with minimum quality standards.

The high dependency also permits Petrobras to use its monopsonistic position in pre-salt and strategic areas to force suppliers to sell products at lower prices. This pressure might affect the technological investments of the provider companies in their resultant effort to reduce their costs and prices.⁷⁵¹ Since Petrobras has to comply with national content policies it will have an economic incentive to use its monopsonistic power whenever it passes the overall minimum threshold percentage limit of acquisition of national goods.⁷⁵² The supplier companies most likely to surrender to the national oil company's pressure for price reductions are those with lower bargaining power, which normally are the less efficient corporations, unable to supply other clients and to export. These firms are usually the most dependent ones on national content policies and those that require more investments in technology and innovation to be able to eliminate their dependency on these policies and to supply new markets. Ironically, the combination of strict local content policies lacking focus with a monopsonistic upstream company creates incentives for the maintenance of Petrobras' purchases at the minimum percentage limit required for national content policies. This happens because as soon as the company surpasses this boundary it will most probably use its dominant position to force prices to be reduced. This pressure, in turn, acts with most intensity on supplier corporations that are

⁷⁵⁰ Article 4 of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

⁷⁵¹ Carlos Jacques Viera Gomes and others, 'Avaliação da proposta para o marco regulatório do pré sal' (Centro de Estudos da Consultoria do Senado federal Textos para discussão, 2009)40.

⁷⁵² The basic formula for calculating the national content percentage is: $NC = (1 - x/y) * 100$; where NC=national content; x=total value of imported components; and y=total sale price. Cf. discussions in chapter 6 and also According to Luiz Cezar P Quintans, *Direito do petróleo: conteúdo local: a evolução do modelo de contrato e o conteúdo local nas atividades de E&P no Brasil* (Freitas Bastos Editora 2010)132.

the most dependent on national content policies. Therefore, the overall structure contributes to the maintenance of these firms in a weak position instead of encouraging them to progressively diminish their dependency on local content policies, creating a vicious cycle for the enduring maintenance of these policies rather than stimulating their gradual elimination.

It is uncertain if Petrobras will actually use its monopsonistic power, since it is a state-controlled company and at the end of the day the rationale for the preservation of local content policies might supersede the corporate logic of increasing profits or reducing losses. Yet the tension between its broader state policies and more specific market realities will always exist and it is most probable that at least on certain occasions the latter will prevail over the former. As discussed in chapter 5, Felipe⁷⁵³ and Gomes⁷⁵⁴ demonstrate that the corporation has on some occasions ignored state preferences, maximising its own corporate interests instead.⁷⁵⁵

Finally, the national content policy in the oil sector should attempt to encourage leading technological firms to enter the Brazilian market. As already mentioned in section 8.1.1, most of Petrobras' supplier companies that bring radical innovations of direct applicability to the oil sector are in fact multinationals. Most of these corporations are not accounted for in the national oil company's local content purchases because they are not based in Brazil, or because their products might have a high level of imported components. Therefore, the current national content policies should exert constant and strict oversight over the possibility of innovative standards in the oil industry being reduced for not including a set of technologically dynamic firms. Ideally, the policy should entice these multinational innovative firms to establish themselves in Brazil, if possible via associations with national enterprises.⁷⁵⁶

⁷⁵³ Cf. Ednilson Silva Felipe, 'Mudanças Institucionais e Estratégicas Empresariais: A Trajetória e o Crescimento da Petrobras a Partir da sua Atuação no Novo Ambiente Competitivo (1997-2010)' (Dphil thesis, Universidade Federal do Rio de Janeiro 2010).

⁷⁵⁴ Carlos Jacques Viera Gomes and others, 'Avaliação da proposta para o marco regulatório do pré sal' (Centro de Estudos da Consultoria do Senado federal Textos para discussão, 2009).

⁷⁵⁵ Petrobras for example did not comply with a decision issued in 2002 by the National Environmental Council (CONAMA) capping sulphur levels in diesel production because of the impact that the required investments would have in its costs. Cf. Ibid.40.

⁷⁵⁶ This topic will be further explored in chapter 9, when specific proposals will be made for the Brazilian oil sector.

8.5 FINANCIAL RESOURCES

Technology and innovation knowingly requires significant disbursements that do not always pay off at the desired and expected level. One important source of financial funds for technology and innovation in the Brazilian oil sector comes from the requirement inserted in concession contracts for concessionaires to spend on these activities 1% of their gross earnings in operational blocks, whenever the Special Participation tax is levied.⁷⁵⁷ Concession contracts, established in Law 9,478, do not apply to pre-salt and strategic areas, which are governed by Law 12,351, and where production-sharing agreements are in force. As the development of the dynamic pre-salt and strategic regions are undertaken, fund returns from this 1% contractual fee are expected to progressively decrease in relative terms, unless they are also inserted in production-sharing agreements.

Hence, unless compensated elsewhere, the prospect of diminishing fee collection for activities of technology and innovation is not good news for an industry that requires significant disbursements in these areas. Another possible reduction of financial resources for such activities comes from the destination of the royalties that are due to the Federal Government.⁷⁵⁸ Before 2010 part of these financial resources were allocated to a Fund – CT Petro, for financing innovation programmes in the oil industry, in universities and research centres. After the enactment of Law 12,351 these resources were all assigned to the Social Fund. Since the Social Fund can also be applied to science and technology, this shift does not necessarily mean that the amount of resources is going to unavoidably diminish, as claimed by Eduardo Guimaraes.⁷⁵⁹ Yet one problem that the legal change causes is that activities of technology and innovation will now have to compete for financial resources with other areas, such as education, sport, culture and health, among others.

⁷⁵⁷ According to Article 50 of Law 9,478 of 6 August 1997 (Lei No. 9.478, de 6 de Agosto de 1997), the Special Participation is levied when the production volume of a block or its profitability is considered high. Decree N. 2.705 spelled out the specific conditions of applicability of the tax.

⁷⁵⁸ Eduardo Augusto Guimaraes, 'Política de Conteúdo Local na Cadeia de Petróleo e Gás: Uma visão sobre a evolução do instrumento e a percepção das empresas investidoras e produtoras de bens' (A Indústria e o Brasil, 2012) 43.

⁷⁵⁹ Ibid.

If at first glance this seems inappropriate, considering that the oil industry is a technologically intensive sector, on the other hand, ring-fencing resources considerably restrains governmental action, limiting its disbursements according to the different circumstantial priorities. Moreover, the Brazilian oil industry has been receiving significant resources for technology and innovation in the last few years, so lack of financial capital has not been a limitation so far.⁷⁶⁰ Most certainly a worse problem is the rational and effective application of these assets in areas that contribute to the creation of an industry with pioneering technological standards.

Against this backdrop, one of the most severe shortcomings in technology – innovation in Brazil has been the lack of interaction between the different institutions involved in technology and innovation in Brazil: universities, research centres, oil companies and the government. While these entities separately hold adequate financial resources, technical expertise and relevant applied knowledge in technology and innovation in their respective domains, they still lack the appropriate degree of effective interconnections and collaboration towards the furtherance of cutting edge technology.⁷⁶¹ Therefore, even though there are elements for the development of a triple-helix model of scientific research in the country, as previously mentioned, significant hindrances still exist for the effective flow of information between the vertices of the triple helix.⁷⁶² In other words, component institutions of the triple helix framework provide quality products and services but the transmission of information and technical expertise between institutions is still deficient. Unfortunately, the current regulatory oil framework and the oil policy in general do not contribute to this increasing institutional interaction. Hence, the Brazilian oil policy should increasingly consider the development and

⁷⁶⁰ Carlos Eduardo Lopes da Silva, Ramon Baptista Narcizo and Rodolfo Cardoso, 'The proximity between Academy, Industry and Government: towards a more sustainable development of a Brazilian oil region' (2012) 52 *Procedia-Social and Behavioral Sciences* 100, 101; and Interview with Olavo Bentes David, Deputy Attorney General of the National Petroleum Agency (ANP) (Rio de Janeiro, 24 July 2013).

⁷⁶¹ Carlos Eduardo Lopes da Silva, Ramon Baptista Narcizo and Rodolfo Cardoso, 'The proximity between Academy, Industry and Government: towards a more sustainable development of a Brazilian oil region' (2012) 52 *Procedia-Social and Behavioral Sciences* 100.

⁷⁶² Adilson De Oliveira and Diana Rubiano, 'Innovation in Brazilian oil industry from learning by using to prospective capacity to innovate the technical frontier' *Observatorio de Politica Estrategica de Producao e Inovacao no Brasil* <<http://www.redesist.ie.ufrj.br/p14-resultados/p14-artigos-publicados>> accessed 1 July 2015 26.

reinforcement of “nexus agents”⁷⁶³ in the country. These agents could perform the fundamental function of coordinating, linking and facilitating technical advancements and innovations between the several entities of the system, acting also as “knowledge translators”.⁷⁶⁴

8.6 CONCLUSION

The overall technological standards of the Brazilian oil industry are considered advanced in international terms. The country undoubtedly holds leading innovation levels in deep-water exploration. This prominent role largely results from important past strategic decisions that relied on significant state presence and support. The corporate move to the offshore through the development of in-house technology would never have taken place without state backing and the vital investments that followed. As demonstrated in this chapter, the initiative was certainly risky, unmatched and involved strict tenacity to a well-designed long-term strategic plan. The efforts were successful, having led to the discovery of the pre-salt exploration frontier.

The development of such a huge exploration frontier now opens new challenges and great opportunities for the Brazilian oil industry in terms of technology and innovation. The opportunity that arises is for Brazil to develop even further its oil industry’s innovation capacity, becoming a world provider of cutting edge technology. Yet some important challenges lie ahead. The first one is the disparity that exists within the Brazilian oil industry as a whole. While the upstream sector is dynamic, efficient and innovative, its national supplier companies still lag behind. The solution to this problem obviously does not involve lowering the capacity of the upstream national oil company but demands, instead, endeavours to effectively develop local providers upwards to meet Petrobras’ standards.

Unfortunately the Brazilian 2010 regulatory framework and the oil policy that it entails seem to be going in the opposite direction. Petrobras has been increasingly overburdened

⁷⁶³ Virginia Acha and Lucia Cusmano, ‘Governance and co-ordination of distributed innovation processes: patterns of R&D co-operation in the upstream petroleum industry’ (2005) 14 *Economics of Innovation and New Technology* 1, 19.

⁷⁶⁴ Ibid. 19, 20.

because of national content policies that lack focus and adequate strategic planning. The excessive reliance on the national oil company's resources for such policies seems to ignore that the existence of a dynamic and technologically advanced upstream oil corporation is essential for the development of a local oil industry of suppliers with similar standards and with effective conditions to become internationally competitive.

A second challenge that exists is for Petrobras itself to evolve further, developing increasing levels of autonomous and pioneering technology, non-dependable on imports and on strategies of learning by using or learning by doing. Cutting edge and radical innovations rely on initiatives that promote scientific knowledge that can be replicated afterwards to the oil industry. It presupposes evolution from assimilative and imitative techniques towards a proactive innovation stance that dictates future standards for the oil industry. Petrobras has been increasingly developing these activities in the last decade. Yet a step further in this direction would require effective strategies of risk sharing and an endeavour of collaboration and interchange with leading international stakeholders. Again, the Brazilian regulatory framework does not contribute to this outcome.

This chapter has argued that the current regulations', which are excessively intrusive, based on a top-down regulatory approach, through command and control strategies, will lead to significant drawbacks in technology and innovation in Brazil. Such shortcomings will inevitably affect Petrobras. Even worse, however, they will not guarantee the development of a dynamic and sustainable industry of suppliers. Instead of using Petrobras to propel its industry of providers towards higher technological standards, suppliers will be dragging the national oil company downwards at the expense of the whole sector. One aspect of the new framework, however, stands as an important exception: the Social Fund, which lists science and technology and education as essential target areas of the projects with its revenue.

Chapter 9 will demonstrate with specific proposals that the Brazilian oil sector, especially in technology and innovation, demands a more versatile, adaptable and flexible regulatory model, in which the different stakeholders reiteratively interact, learn from each

other and provide the necessary changes to the governance setting according to the different required situations and challenges. The existence of such approach is not inconsistent with the maintenance of genuine state objectives of an increasing state share in oil activities or for its fair distribution among social groups and coming generations. The state has performed essential roles in the past for the development of a dynamic oil industry in Brazil. It now needs to adapt to a new reality, in which its role is still fundamental, but rather different. Instead of dictating it should be stimulating, instead of requiring it should be relying, instead of controlling it should regulating.

PART III – TOWARDS A BETTER GOVERNANCE SETTING

The first part of the thesis provided the legal and theoretical foundations for the analysis, discussing central theories, describing the main institutions in the Brazilian oil sector and also the international experience in oil regulation. Part II analysed how the Brazilian regulatory framework is expected to affect important oil policy variables: i) investments; ii) production; iii) technology and innovation; and iv) strategic control of oil.

Given that the analysis has already been made in the first two parts, the goal of this part III is to propose the way forward. It aims at improving the current governance setting of the Brazilian regulatory framework through several proposals, described in chapter 9, and to conclude the thesis in chapter 10, explaining why the current model is inadequate and how the provided recommendations will improve it.

This chapter presents specific proposals for the Brazilian oil sector, which should be considered alongside the other recommendations made throughout previous chapters. The proposals are based on four essential premises. First, their main objective is to overcome the limitations and problems pinpointed throughout the thesis. Secondly, they seek plausibility and applicability, avoiding recourse to ideal-type situations of difficult implementation. Thirdly, they go against a myth and common understanding that the problems of the regulatory framework essentially reside in their contractual regime, according to concession or production-sharing agreements. An inherent superiority of a regulatory framework cannot be claimed on the grounds of its contractual regime.⁷⁶⁵ This view is shared by several oil specialists and also by all the interviewees for this thesis who expressed their opinion on the topic.⁷⁶⁶ Finally, the suggestions revolve around the idea that the regulatory framework should avoid radical changes, drastic disruptions and respect all existing contracts, conferring predictability and certainty to stakeholders.

Against this backdrop, regulations should attempt to avert intrusiveness and imperative commands without taking into account the environment to which they apply. Rather, they should be constantly interacting with it, receiving and processing the inputs of different stakeholders and considering the required adjustments. A dynamic sector susceptible to constant changes such as the oil industry demands in most situations a versatile regulatory approach instead of a stiff and rigid command and control model. This does not mean that regulations should merely have a passive function, reacting to the different subsystems with which they interact. They can actually perform an important steering and guiding role, directing

⁷⁶⁵ See Appendix for a comparison on the different oil regimes and their respective contractual frameworks.

⁷⁶⁶ Cf. Michael Likosky, 'Contracting and regulatory issues in the oil and gas and metallic minerals industries' (2009) 18 *Transnational Corporations* 1; Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 115,159; Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); and Daniel Johnston, *International petroleum fiscal systems and production sharing contracts* (PennWell Books 1994).

and enticing stakeholders to desirable outcomes, as the subsequent propositions will seek to demonstrate.⁷⁶⁷

The chapter is subdivided into five main sections. The first recommends the abolition of operational exclusivity. The second proposes the deactivation of PPSA and the reorganisation of the governance structure of the operational committee. The third suggests changes in local content policies. The fourth section addresses necessary modifications in Petrobras' governance structure, while the fifth presents other specific proposals that do not require legal amendments.

9.1 ABOLITION OF THE OPERATIONAL EXCLUSIVITY

As constantly referred to throughout the thesis, operational exclusivity is the most detrimental aspect of the 2010 regulations because it entails significant drawbacks in terms of investments, production and technology-innovation. Even worse, however, the operational exclusivity does not contribute to the government's goal of asserting more strategic control over oil, as demonstrated in chapter 8. Therefore, it comes as no surprise that the first recommendation here is for its abolition. As demonstrated in previous chapters, the exclusivity provision goes against the interests of Petrobras, international oil companies and local providers of services and equipment.

The easiest way to eliminate the operational exclusivity is through an amendment of Law 12,351. Its approval requires a simple majority in the chamber of deputies and the senate.⁷⁶⁸ Yet even though there are robust reasons for the revocation of operational exclusivity, several politicians might still resist the idea, especially those supportive of the government. Their opposition might be propelled by a certain degree of support that they may receive because of the popular appeal that the exclusivity might have. The attractiveness could derive

⁷⁶⁷ John Paterson, 'Reflecting on Reflexive Law' in King and Thornhill (eds), *Luhmann on Politics and Law: Critical Appraisals and Applications* (Hart Publishing 2006) 16.

⁷⁶⁸ Article 47 of the Constitution of the Federative Republic of Brazil (Constituição da República Federativa do Brasil).

from the idea that the exclusivity promotes the corporate interests of a cherished and symbolic company to Brazilians.

This is certainly a potential source of problems. It can, however, be circumvented with rational public discussions and debates that pinpoint the hindrances that the provision causes. In 1995, for example, bill proponents were successful in demonstrating in the Brazilian Congress that the sector needed opening up to international oil companies to attract investors and share Petrobras' investment burdens. Of course, the ideological environment at that time, in the 1990's, was more favourable to initiatives of regulatory reform, if compared to nowadays. Yet the recent scenario of a steep oil price plunge and the increasing onus that national oil companies are facing might facilitate the political ambience towards the elimination of exclusivity.

The reform should ideally focus on establishing provisions that do not excessively hinder the possibility of corporate adaptability as a response to the diverse market realities. The drawbacks associated with the operational exclusivity are an instructive example of the importance of allowing flexibility in the regulatory framework for changing economic scenarios. In 2010, when the provision was enacted, the attractiveness of the Brazilian pre-salt area was certainly high, as already mentioned in previous chapters. It was one of the only newly discovered big and promising oil regions in the world. Brazil had been facing a relatively promising economic situation and oil prices were around US\$ 100 per barrel. In January 2015, the price dropped below US\$ 50 and the market started facing oversupply because of the shale oil boom in the US and the contraction of international demand.⁷⁶⁹ Therefore, the attractiveness of Brazilian pre-salt oil blocks significantly reduced during this period. If the operational exclusivity might have not been a deal breaker in 2010, because of the circumstances at that time, in the year 2015 it most certainly is a factor that will significantly hinder future investments in the region, since Petrobras' operational and financial capacity is significantly restrained. Had the Brazilian regulatory provisions allowed for a greater flexibility, this

⁷⁶⁹ Europe Brent Spot Price FOB (Dollars per Barrel) reached US\$ 47.76 in January 2015 according to the US Energy Information Administration available at: <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RB RTE&f=M> accessed 20 May 2015.

limitation of exclusivity could have been at least temporarily suspended, or could have counted with a similar procedure of non-applicability.

One last point should be made before turning to the next section. According to the premises described at the beginning of the chapter, predictability and respect of the existing contracts are essential to ensure that the regulatory framework will not send the wrong message to the different stakeholders about unilateral and arbitrary modification of contractual conditions. Therefore, the first and only contract that has been signed under the exclusivity requirement should maintain the original agreed conditions. Nothing impedes, however, parties from being offered the option of discarding the exclusivity clause as long as there is a joint and mutual agreement for change. There are good reasons to predict that if offered this option the parties will accept it, since they can both benefit from its elimination.

9.2 PPSA'S DISSOLUTION

The second proposal is for PPSA's dissolution. Its existence causes significant problems as extensively demonstrated in previous chapters. The worst one is related to the governance structure imbalance in the operational committee, which creates substantial drawbacks in terms of investment, technology and innovation.

The other shortcomings derive from the functional overlap with governmental bodies such as in the enforcement of local content policies. According to Article 4, I, (c) of Law 12,304 PPSA should perform these functions, but historically they have been under the competence of ANP. As normal regulatory tasks, these roles could have been better performed by ANP, a typical regulatory agency, instead of PPSA, a state enterprise.⁷⁷⁰

Close monitoring of producing companies' costs is another of PPSA's competences.⁷⁷¹ As previously examined, in production-sharing agreements firms have a natural incentive to inflate

⁷⁷⁰Antônio Luís de Miranda Ferreira, 'Problemas e inconsistências jurídicas do novo marco regulatório: a ótica dos princípios Constitucionais da livre iniciativa, da economia de mercado e do direito comercial' in Giambiagi (ed), *Petróleo: Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier 2013).

⁷⁷¹ Article 4, I, (e) of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

their costs, since they will be reimbursed for them (cost oil).⁷⁷² Close oversight is therefore necessary to avoid this moral hazard situation. In spite of the relevance of this function, it is again a typical regulatory function, which could have been perfectly performed by ANP.

Regulation is a fundamental state function, normally involving administrative police power such as the enforcement of rules. Corporations cannot perform such functions, even if they are state owned enterprises, such as PPSA. Notwithstanding being a fully state owned enterprise, PPSA is still under the jurisdiction of private laws since it is a joint stock company.⁷⁷³ Furthermore, if all these essential tasks could have been more effectively performed by ANP, there is no need for the existence of this state-owned company, especially considering all the drawbacks it causes.

Here again, the abolition of PPSA would have to come through a legal amendment of Law 12,351, which would require a simple majority in the Chamber of Deputies and in the Senate. Similarly to the removal of the exclusivity, a certain reaction to this proposal can be expected in the political spectrum, especially coming from deputies and senators tilted towards leftist positions. Since the entity has already been created, resistance can also arise from its staff, which might have important political connections, reinforcing further the opposition.

Yet, apart from these actors, all other industrial stakeholders are expected to support the initiative. Therefore, a political case for this amendment can be made if conducted with serious discussions of all the drawbacks associated with PPSA. Concerning the existing contract that has been signed, in which PPSA has an important role, it can be easily renegotiated with the agreement of the involved parties, since they are all expected to benefit from the modifications. The fact that PPSA did not participate in the consortium with financial contributions of any kind and holds 50% of deliberative power in the operational committee would facilitate the process. The overall corporate structure of the consortium could be easily modified by simply doubling each party's share to compensate for PPSA's dissolution.

⁷⁷² Article 29, IV of *ibid.*

⁷⁷³ Article 3 of Law 12,304 of 2 August 2010 (Lei 12.304, de 2 de Agosto de 2010) .

9.3 CHANGE IN LOCAL CONTENT REGULATIONS IN THE OIL SECTOR

Local content regulations are another example of an intrusive regulatory approach that leads to significant shortcomings. Therefore, the proposals here described all seek to eliminate this authoritative nature of the regulations, suggesting a more participatory model of incentives and inducements towards previously established goals.⁷⁷⁴ Within this setting, the utmost priority of any change to the current policy should be to eliminate its two major problems: i) lack of focus; and ii) excessive reliance on one sole company.⁷⁷⁵

Concerning the first shortcoming, the priority should be to create a technical working group within the Brazilian government, which would be responsible for identifying supplier sectors in the oil industry that hold two basic characteristics: i) the condition of effectively becoming internationally competitive in the medium term; and ii) the ability to aggregate significant levels of technology and innovation to the production process. The group would contract leading consultant companies in the sector and invite relevant organisations to contribute with their feedbacks, such as the National Organisation of the Petroleum Industry (ONIP) and the Brazilian Institute of Petroleum (IBP), for example. Entities would each prepare their separate reports, which would be thoroughly considered by the group. Based on the cohort's discussions and on the feedback received from organised public hearings, the sectors would be then ranked in order of priority, with reasons given. Whenever two sectors remain at the same level, priority should be afforded to the one that potentially contributes more to employment creation. The process would also have to be conducted with the broadest transparency and the group's reasoned deliberations would have to be shielded from political pressure, maintaining, above all, its essentially technical profile.

The sectors included in the list would then receive governmental incentives for their development. Considering the availability of funds, the government will assess whether it is possible to cover all the sectors or not. Required cuts in funding will first affect segments

⁷⁷⁴ Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013).

⁷⁷⁵ See discussions in section 7.3.

located at the bottom of the priority list. The idea is to design policies that can boost the recipients' productive capacity instead of creating a captive and reclusive market for them, as the current local content policies do. The initiatives would essentially build on already existing projects, actually increasing their scope, magnitude and focusing them on the selected sectors. Therefore, according to a cost-effective logic, there is no need to create additional structures for these actions but only to build further on the existing ones, for instance: CT-Petro, PROMINP and the funds coming from BNDES and FINEP. These are important initiatives that should be further expanded and increasingly directed to the mentioned specific targeted sectors.

As already described in chapter 6, CT-Petro is a fund which aims at boosting the productivity of the oil industry, the quality of its products and in reducing its costs and prices. PROMINP, in turn, seeks to increase the participation of local suppliers in the national oil industry. BNDES is the Brazilian national development bank, which provides loans using lower interest rates, while FINEP is a public enterprise responsible for managing a fund that provides resources for initiatives in research and development.

It is also fundamental to make clear upfront to beneficiary companies that the incentives are temporary. They will therefore work to a previously determined deadline and with a mechanism of progressive phasing-out of the incentives, so the companies can gradually adapt to new conditions without facing considerable adversity. The existence of such time limit would eliminate one of the most recurrent problems of local content policies in Brazil, which is their tendency to become permanent. As already mentioned, these policies should be provisional; otherwise they become a pernicious mechanism of rent transfer between contemplated sectors and consumers.⁷⁷⁶

Another goal of the previously mentioned working group should be to determine which players in the Brazilian oil sector can best perform the function of "nexus agents", disseminating

⁷⁷⁶ Cf. Oystein Noreng, 'Brazil and Norway- Offshore Petroleum Experiences and Lessons' (2009) 35 *Journal of Energy and Development* 79; Walter De Vito and Richard Hochstetler, 'Perspectivas para os investimentos petrolíferos no Brasil' in Giambiagi and Velloso Lucas (eds), *Petróleo-Reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Editora Ltda 2012) and Silvana Tordo, *National oil companies and value creation* (World Bank Publications 2011) 10.

knowledge and technical innovations throughout the supply chain. As demonstrated in chapter 7, one of the hindrances to further innovation improvements in the Brazilian oil sector is that while universities, research centres, companies and governmental bodies individually hold relatively adequate standards for technological development, the innovation flow within them still lacks volume and steadiness. A specific policy endeavour focused on creating the conditions for a systematic and constant flow of knowledge and expertise among these institutions should be created to overcome such limitation.

Previous chapters demonstrated that supplier companies such as Norske Veritas and Stolt Comex Seaway in the North Sea are increasingly performing this role of nexus agents. They provide integrated solutions to their upstream oil company clients.⁷⁷⁷ Building on the experience of the North Sea, a specific policy should be designed in Brazil to foster the formation of joint ventures between these international companies and their national counterparts. Chapter 7 set out the importance that joint ventures perform in the transfer of technology between firms. They also are an effective method that established leader companies in other jurisdictions use to enter new markets, especially in situations of uncertainty and institutional instability.⁷⁷⁸ Hence, this proposal would most probably be in the common interest of international and local supplier companies since one would benefit from the possibility of technological transfers while the other would have a national partner with established experience in local conditions.

Excessive reliance on one sole upstream firm also significantly exacerbates one of the main problems of the oil supply industry in Brazil. As mentioned in chapter 6, national supplier companies are excessively dependent on Petrobras' purchases, which occur in peaks and troughs, according to the company's needs.⁷⁷⁹ Since national providers organise their selling

⁷⁷⁷ Virginia Acha and Lucia Cusmano, 'Governance and co-ordination of distributed innovation processes: patterns of R&D co-operation in the upstream petroleum industry' (2005) 14 *Economics of Innovation and New Technology* 1.

⁷⁷⁸ Mike W Peng, 'Institutional transitions and strategic choices' (2003) 28 *Academy of management review* 275, 286.

⁷⁷⁹ Cf. Jose Renato Ferreira de Almeida, 'Conclusões e Recomendações de Política' (Estudo da Competitividade da Indústria Brasileira de Bens e Serviços do Setor de P&G, 2007); Helder Queiroz Pinto Jr and Mariana Iooty, 'Perspectivas de Desenvolvimento do Setor Petróleo e Gás no Brasil' (2010) 55 *Serie*

plans following the forecasted average demand, they do not benefit from all possible transactions' economies of scale. Even worse, however, in peak situations Petrobras has to import products for lack of national capacity.⁷⁸⁰

Petrobras' operational exclusivity worsens this dependency of national providers and the problems related to peak and troughs in its purchases. The best way to mitigate this dependency is to allow for the presence of several operating upstream companies, since different firms have diverse demand needs throughout the year. This solution could also contribute to an increasing interaction of national providers with international oil companies, facilitating future joint worldwide projects.⁷⁸¹ Therefore, the revocation of the operational exclusivity provision would assist significantly in mitigating this problem.

Finally, there is one last fundamental proposed modification that seeks to incorporate the steering and guiding role of regulations, without intruding excessively in the corporate daily routine of regulated stakeholders. The recommendation is for all purchases of oil companies and their suppliers to be notified to ANP through the filling of an electronic spread sheet, which would detail their operations and their respective providers. This information would be considered strictly confidential.⁷⁸² While completing the document the companies would have access to a list of local suppliers in each segment and to their selling conditions, such as prices and delivery time frame, through direct links to these corporations' webpages. Whenever not opting for the listed national firms, oil companies would have to provide the reasons for not doing so. All this information would be then sent electronically to ANP, allowing it to perform a constant monitoring of relevant data and the presented motives for not buying from Brazilian firms. The government would also express beforehand that it will give priority in future bidding

Eixos do Desenvolvimento Brasileiro; and Eduardo Augusto Guimaraes, 'Uma avaliacao da politica de conteudo local na cadeia do petroleo e gas' in Bacha (ed), *O futuro da indústria no Brasil: Desindustrialização em debate* (Civilização Brasileira 2013).

⁷⁸⁰ Jose Renato Ferreira de Almeida, 'Conclusoes e Recomendacoes de Politica' (Estudo da Competitividade da Industria Brasileira de Bens e Servicos do Setor de P&G, 2007).

⁷⁸¹ Eloi Fernandez e Fernandez, 'Industria nacional de bens e servicos nos arranjos produtivos do setor de oleo e gas natural no Brasil' in Giambiagi (ed), *Petróleo: reforma e contrarreforma do setor petrolífero brasileiro* (Elsevier Brasil 2013) 109.

⁷⁸² Because the information will be considered confidential and only ANP will have access to it, the initiative does not facilitate collusive practices nor raises competition concerns.

rounds and in coming governmental procurements to corporations that source their equipment and services from national providers.

Such preference does not mean that current public tenders' criteria for selecting the winning consortium for operating in pre-salt and strategic areas would no longer apply. In pre-salt and strategic areas the choice could still be determined by the highest profit oil accruing to the state, but it would also allow the consortium group with the highest use of local content products and services to have a preference in its bid.⁷⁸³ The preference would come in form of a percentage bonus that would be added to the percentage amount of the profit oil. Thus, if a company offers 40% of profit oil to the government and has the right to a 10% bonus because of its local content purchases, its final offer would be of 50% (40% + 10%) and it would be able to win a bid over another corporation that presents a 45% offer in profit oil but does not have any bonus. In the case of a consortium of companies presenting a bid, the final bonus of the group would be determined according to a weighed average, based on the volume of purchases of each company. CNPE would decide, in turn, the maximum bonus amount allowed to be used in each bid, according to the specific conditions of each public tender and taking into account the government's circumstantial requirements and needs.

The applied percentage would not be publicised, the same applying to each company's national purchases, informed to ANP via the cited spread sheets. The reason for not disclosing this information is to encourage competitors to increasingly seek higher levels of national purchases, driven by the goal of outpacing their competitors for lack of knowledge of each other's level of local acquisitions.

Another possibility is to create a list of companies according to their respective purchases of strategic local content equipment. The preference bonus would be given to the companies in decreasing percentage levels according to their placement in the list, until a certain threshold number previously established by the government, following its own

⁷⁸³ Areas not governed by Law 12,351 do not have a fixed and pre-determined bidding selection criterium such as the one established in this statute, which is the highest percentage of profit oil to the government. Cf. Article 18 of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

circumstantial possibilities. Hence, the first company with the highest level of local purchases would be given, for example, a 20% bonus, the second, a 15% one, and so forth until a minimal pre-decided threshold level. Maintaining the competition emulation logic of the previous proposal, this list would be confidential until the date of the bidding rounds and all relevant material would only be publicised afterwards, when explaining and detailing the reasons for the choice of the winners.

The advantage of such approaches is that oil companies will be induced to progressively move towards local suppliers, since they will expect to receive a future compensation for this revealed preference. The expectations in this sense would lead to an effective competition between oil companies for increasing local acquisitions. Moreover, whenever national providers cannot adequately match demand at a competitive and desired level, their clients will not be excessively penalised for this fact, since they will be allowed to import these items. Yet they will need to provide justifications for not buying local. This only requirement would allow authorities to closely and timely monitor these reasons and to continuously attempt to tackle existing problems.

Hence, the proposals allow for a gradual and smooth adaptation of the supply and demand for local products and services without excessive impositions that hinder the sector as a whole as the current national policies do. Following the rationale that has been successfully implemented in Norway, the logic is to induce and promote local purchases instead of intervening and requiring specific levels and percentages of sales.⁷⁸⁴

One final aspect to be considered is that such proposal will gain effectiveness in the context of abolition of the operational exclusivity, since several oil companies would be then holding activities in pre-salt and strategic areas of the Brazilian upstream oil sector and would therefore be presenting their percentage levels of national purchases in these locations. Yet even if that is not the case, the recommendation is still valid, since companies would still be buying local in areas not under the jurisdiction of Law 12,351. These companies would be

⁷⁸⁴ Oystein Noreng, 'Brazil and Norway- Offshore Petroleum Experiences and Lessons' (2009) 35 *Journal of Energy and Development* 79, 93.

presenting then their respective percentage levels of national purchases together with Petrobras, as part of a consortium, since the Brazilian NOC has to mandatorily participate in all formed consortia disputing public tenders in the country.⁷⁸⁵

9.4 MODIFICATIONS IN PETROBRAS

Petrobras requires urgent modifications in its bylaws to reduce problems of conflict of interests arising from governmental board representatives. As extensively demonstrated throughout the thesis, one of the fundamental reasons for the company not to have provided necessary price adjustments in the downstream oil segment is the disapproval of the former president of the board of directors, the Minister of Finance, who had been primarily worried about inflation control.⁷⁸⁶ Support for his position had been facilitated because other governmental board representatives also came from economic areas and he had the President of the Republic's essential backing.

To avoid these kinds of situations of conflict of interests, Petrobras' bylaws should be amended to forbid the indication of government representatives holding state commanding positions.⁷⁸⁷ This proposal is similar to Norwegian rules, which forbid civil servants to be board members in state companies.⁷⁸⁸ Yet the recommendation here does not go as far as the provision in Norway, since a significant amount of specialists in Brazil holding profound and detailed knowledge in the oil sector are civil servants. Therefore, not considering them eligible for board positions would excessively restrain the choices and relegate the selection to a limited group of oil market executives and academic specialists. Moreover, most of the civil servants in Brazil are considered to have a significant degree of autonomy, rarely revealing historical and close political links and affiliation. Differently from other Latin American countries, civil

⁷⁸⁵ Article 20 of Law 12,351 of 22 December 2010 (Lei No. 12.351, de 22 de Dezembro de 2010).

⁷⁸⁶ The Ministry of Finance, Guido Mantega, resigned from the Board on 26 March 2015.

⁷⁸⁷ State commanding positions in Brazil are known as "cargos de DAS (Direção e Assessoramento Superior).

⁷⁸⁸ Mark C Thurber and Benedicte Tangen Istad, 'Norway's evolving champion: Statoil and the politics of state enterprise' (Program on Energy and Sustainable Development : Working Paper 92, 2010) 20.

servants in Brazil have to pass a competitive selection exam and they are chosen according to a meritocratic selective process.

Yet one relevant aspect to be considered in this proposal is whether the government would lose its capacity to defend its legitimate interests in the company whenever needed. Though this possibility always exists, even if remotely, the fact that the government is appointing board members with profiles it deems appropriate, significantly mitigates it. These board members will represent the government and will therefore have legitimacy to pursue state political goals. Yet in cases in which these targets clash with other company objectives or affect the corporation's performance, they will be required to specifically state the reasons for following the political route in their deliberations, demonstrating how the country will benefit from the decision and what will be the consequences for the company.⁷⁸⁹ The goal of this requirement is to increase accountability standards and transparency by correctly distinguishing "sovereign owner" functions, exerted on behalf of the nation and "company shareholder" functions.⁷⁹⁰ This requirement will increase transparency and accountability, indicating to different stakeholders what the national oil company's non-commercial targets are and how will it deal with trade-offs arising from conflicting goals. Moreover, it attempts to exclusively restrain the use of political motives to cases of justifiable national interest, with prior assessment of the corporate impacts of the deliberations.

Another essential aspect to be considered by Petrobras is its pricing policy, which lacks transparency and has been following different governmental priorities beyond the corporation's finances. As extensively argued, such policy has disfavoured minority shareholders and potential future investors, who are extremely concerned about the company's profitability. Petrobras' oil pricing policy, which aims at providing a convergence between domestic and international prices in the long run, is not essentially bad since it reduces, in principle, excessive volatility.⁷⁹¹ The oil price is fundamentally unstable⁷⁹² and this instability has severe

⁷⁸⁹ Joaquim R Fontes Filho and Lidice M Picolin, 'Governança corporativa em empresas estatais: avanços, propostas e limitações' (2008) 42 *Revista de Administração Pública* 1163, 1182.

⁷⁹⁰ Glada Lahn and others, 'Report on Good Governance of the National Petroleum Sector' (2007) 10.

⁷⁹¹ *Ibid.* 29.

detrimental effects in planning, business performance, national finances and investment.⁷⁹³

Therefore, initiatives that reduce it are not necessarily inappropriate.

There are two key problems with Petrobras' pricing policies. The first one has already been addressed: the excessive use of the company and its resources for political goals that excessively affect its profitability. By not allowing its downstream prices to be adjusted to international standards the corporation's profitability has been significantly impaired. In net terms prices have been kept artificially low, which has led to an accumulated loss of \$26 million at the downstream level, from 2011 to 2014.⁷⁹⁴ The second one is the lack of transparency as to how and when will the aimed price convergence to international levels be attained. Such opacity has caused subsequent delays in the convergence, which, in turn, have considerably affected the company's profitability.

Taking into account that the current pricing policy is not theoretically and intrinsically unsuitable, the proposal here is for the company's downstream price to follow a pre-established weighted average of international prices, allowing a certain percentage band variation, which would be determined each year by the company's board, according to market specificities.⁷⁹⁵ The Brazilian national oil company would ensure that its price would be maintained within this previously defined band. Therefore, Petrobras' interference in prices would only be triggered in cases of excessive oscillation. Such a measure would give predictability to industrial stakeholders while also shielding them from the drawbacks of excessive volatility. Moreover, the pre-establishment of the percentage terms by Petrobras' board each year would allow the company to make the necessary periodical adjustments so its profitability is not unduly affected by unpredicted and unforeseen circumstances.

⁷⁹² Cf. Nadine Bret Rouzaut and Jean Pierre Favennec, *Petóleo & Gás Natural: Como Produzir e a que Custo* (Synergia 2011); and Rosélia Piquet, *Mar de Riqueza, Terras de Contrastes: O Petróleo no Brasil* (Mauad Editora Ltda 2011) 88.

⁷⁹³ Macartan Humphreys, Jeffrey Sachs and Joseph E Stiglitz, *Escaping the resource curse* (Cambridge University Press 2007) 267.

⁷⁹⁴ Amrita Sen and others, 'Brazil's Struggles' Energy Aspects - In Focus <<https://www.energyaspects.com/publications/view/brazils-struggles>> accessed 15 June 2015.

⁷⁹⁵ Since refined oil products are commodities with their prices essentially determined by the international supply and demand, such policy would ensure that Petrobras' prices would not depart excessively from international market conditions.

9.5 OTHER SPECIFIC PROPOSALS

Finally there are some other specific proposals that do not fit in the broad categories cited above. Most of them involve procedural changes not requiring legal amendments or institutional modifications. Therefore, such proposals can be implemented via administrative rulings and do not depend on congressional approval.

The first is the setting of a timetable for bidding rounds. This has been a recurrent claim of the oil industry operating in Brazil. As previously demonstrated in the thesis, the main reason for not carrying out this auction timeline is the government's priority to first develop a robust industry of suppliers to match the demands that will follow from successive bidding rounds. This standpoint is counter-productive and represents a clear inversion of the industrial logic of creating linkages and spin-offs throughout the economy, in which the supplier companies respond to an existing demand.⁷⁹⁶ David Zylberstajn, ANP's first Director General put it in simple and direct terms: "The local industry of suppliers ought to follow the pace of the upstream petroleum industry. Not the opposite."⁷⁹⁷

Therefore, it is essential to provide a clear roadmap for future public auctions, allowing potential interested parties to prepare in advance for the bidding rounds. Such a programme would offer predictability for companies considering forming consortia for the tenders and would also ensure that future opportunities will be available in the country in upcoming bids. This guarantee is important for corporations because it opens up the possibility of using equipment and capital from one block in other future ones. The measure is also extremely favourable to supplier firms. As previously mentioned, one of the most significant problems for

⁷⁹⁶ Albert O Hirschman, *Essays in trespassing: Economics to politics and beyond* (CUP Archive 1981) cited in Paul Stevens, 'National oil companies: good or bad?' National oil companies workshop: Current roles and future prospects <<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.197.8929&rep=rep1&type=pdf>> accessed 13 May 2014. 9.

⁷⁹⁷ Personal translation from Andre Ramalho and Rodrigo Polito, 'Oposição 'acolhe' propostas do setor do petróleo' *Valor Econômico* (Rio de Janeiro) <<http://www.valor.com.br/brasil/3719328/oposicao-acolhe-propostas-do-setor-do-petroleo#ixzz3EzzPwef8>> accessed 4th of February 2015.

provider companies in the Brazilian oil sector is the uncertainty of forthcoming demand.⁷⁹⁸The existence of a timeline of public auctions in the oil sector would reduce this unpredictability.

Finally, the last recommendation involves the creation of stimuli for the establishment of refining companies in Brazil. If more companies enter this market, Petrobras will be able to focus further on the more profitable upstream sector,⁷⁹⁹where it holds greater competitive advantages. Actually the mere fact that Petrobras will cease the policy of postponing necessary price adjustments of downstream oil prices would act as an important incentive for refining companies to enter the market, as long as they consider that there will not be a future reversion to the preceding situation. As previously mentioned, one of the facts that has led refining companies to abandon the sector in Brazil is Petrobras' pricing policies, consistently below international standards. The withdrawal of this subsidy policy would also reduce demand and diminish Petrobras' necessity of refining oil, acting as a further incentive for it to concentrate on the upstream segment.

9.6 CONCLUSION

These proposals seek to eliminate the principal drawbacks of the current regulatory framework in Brazil by inserting provisions that encourage versatility, adaptability and a higher level of interaction with stakeholders. They centre on those recommendations most likely to eliminate the worst shortcomings of the current regulatory framework.⁸⁰⁰Several other proposals that could have been made concerning aspects analysed in previous chapters were relinquished to focus upon the recommendations most likely to eliminate the worst shortcomings of the current regulatory framework.

⁷⁹⁸ Jose Renato Ferreira de Almeida, 'Conclusoes e Recomendacoes de Politica' (Estudo da Competitividade da Industria Brasileira de Bens e Servicos do Setor de P&G, 2007) 19.

⁷⁹⁹ Cf. Rosélia Piquet, *Mar de Riqueza, Terras de Contrastes: O Petróleo no Brasil* (Mauad Editora Ltda 2011) 23; and Edmar Luiz Fagundes de Almeida, 'Seminário GEE2013: Os Desafios da Energia no Brasil' (2013).

⁸⁰⁰ Other proposals are contained in other parts of the thesis. Cf. section 2.2.1.3, concentration of the Social Fund on its social and intergeneration saving aspects; and section 4.2.2, the possibility of conferring a negotiation phase in Brazilian bidding procedures to avoid the winner's curse phenomenon.

During the writing of the thesis numerous Bills were presented to the Brazilian Congress, related to many aspects of oil regulation.⁸⁰¹ This demonstrates that the political environment has become progressively more favourable to reforms. Senator Serra's Bill is the most significant in view of the importance it assumed in Congress from April 2015 onwards.⁸⁰² The Bill suggests the elimination of the operational exclusivity and Petrobras' mandatory 30% share in pre-salt and strategic regions.

While the Bill was limited to the reform of these two features, and failed to address other detrimental aspects of the regulatory framework, it goes in the right direction. Senator Serra's stated objective was the importance of removing obstacles to investment and yet he did not propose the abolition of PPSA, which still maintains a 50% share in operational committees and therefore retains the possibility of aligning its interests with Petrobras. Another problematic aspect of the Bill is that, like the 2010 reform, it is being conducted hastily, without the appropriate level of debate and discussion required for these complex issues.⁸⁰³

Senator Serra has stressed that the reforms are necessary in light of the prevailing economic and financial circumstances facing Petrobras, including the changing international conditions, the corruption scandals and the difficulties it is having raising funds. It is recognition that future reforms should be mindful of the dynamic nature of the oil sector and avoid an excessive focus on the short term. They should be flexible while also maintaining the necessary degree of predictability. The reform proposals presented in this thesis similarly advocate the need for flexibility and adaptation to the changing conditions facing the Brazilian oil sector.

⁸⁰¹ Cf. PROJETO DE LEI DO SENADO No 131, DE 2015 available at: <<http://www.senado.gov.br/atividade/materia/getPDF.asp?t=162135&tp=1>> accessed 2 June 2015; PROJETO DE LEI DO SENADO No 254, DE 2015 - COMPLEMENTAR available at <<http://www.senado.gov.br/atividade/materia/getPDF.asp?t=164782&tp=1>> ; PROJETO DE LEI DO SENADO No 400, DE 2014, DE 2014 available at: <<http://www.senado.gov.br/atividade/materia/getPDF.asp?t=158511&tp=1>> accessed 2 June 2015.

⁸⁰² PROJETO DE LEI DO SENADO No 131, DE 2015 available at: <<http://www.senado.gov.br/atividade/materia/getPDF.asp?t=162135&tp=1>> accessed 2 June 2015.

⁸⁰³ On 16 August 2015 urgency requirement for voting the bill of law was approved by the Senate. Cf. Raquel Ulhoa and Vandson Lima, 'Projeto que muda regra do pre-sal ganha urgencia' *Valor Economico* (Brasilia, 17 June 2015) <<http://www.valor.com.br/politica/4097216/projeto-que-muda-regra-do-pre-sal-ganha-urgencia>> accessed 20 June 2015.

10 – CONCLUSION

Brazil's oil policy is currently at a crossroads. While in the past its aim was at oil dependency reduction and self-sufficiency, in the future the possibility exists to become an important oil exporter with a solid and technologically advanced industry. The country is presently experiencing the confluence of these two distinct moments, the important starting milestone being the discovery of pre-salt deposits, in 2008, and the resultant 2010 regulatory reform. The extent to which these future prospects will actually materialise is heavily dependent upon how the issues raised by this thesis will be tackled.

Strikingly, the enquiries here formulated were not publicly debated or discussed to the extent necessary between 2008 and 2010. These concerns were largely neglected and bypassed by the discussion over the share of royalty revenues among federal entities. This was essentially as a result of the government's inadequacy in dealing with expectations after the pre-salt discoveries. "Lottery ticket", "passport for the future" were terms indiscriminately used to refer to the oil findings, advancing the idea of immediately available riches, free of cost. Such a governmental approach at the very moment when it proposed a change in the regulatory framework channelled the discussions towards short-sighted and excessively narrow political struggles over the financial proceeds of oil yet to be extracted. Debates reduced further after the 2010 reform laws were enacted. The sentiment that seems to have prevailed is of a *fait accompli*, of improbable reversion, which diminished the interest in the topic. The recent corruption scandals involving Petrobras will most probably reinsert this thesis' discussion topics on to the public agenda, since they will most certainly emphasise and precipitate some of the outcomes here forecasted, advancing the thesis' main conclusion that the current regulatory governance framework will lead to substantial shortcomings in terms of investments, production and technology – innovation.

The 2010 reform took place when Brazil was considered extremely attractive for the oil business: prices were high, few vast discoveries such as the pre-salt had been made in the world and the country was considered institutionally stable, with a solid and reliable industry.

Petrobras, in turn, was the vector of this success and a source of pride for all Brazilians. The modifications to the national oil regulatory framework were conceived within that context and as a result now take on an excessively intrusive and rigid approach, based on hierarchized command and control provisions. The main goal was to attain a greater strategic control over oil. Little attention was paid to a careful assessment of other undesirable consequences of the modifications or structural shifts in the trading environment itself.

The new regulatory framework will have significant drawbacks in three of the four variables analysed in the thesis: investments, production and technology-innovation, essentially because of its excessively interfering and rigid approach. In line with the responsive and reflexive theoretical frameworks,⁸⁰⁴ all the predicted consequences can be broadly categorised into three dimensions, considering whether the shortcomings derive from: non-intended side-effects, lack of collaboration of affected stakeholders or from an increase in monitoring and enforcement costs.⁸⁰⁵

In terms of investments, the most important drawbacks derive from Petrobras' operational exclusivity and the governance setting of operational committees. In the first case, if no company in the world would be able to explore the vast area of the pre-salt on its own, Petrobras with its evident financial limitations is certainly not prepared for the task. The significant drop of oil prices and the downgrading of the firm's rating by Moody's Investors Service, in February 2015, and Standard and Poor's, in September 2015, makes this task even

⁸⁰⁴ Cf. Ian Ayres and John Braithwaite, *Responsive regulation: transcending the deregulation debate* (Oxford University Press 1992); John Braithwaite, 'Responsive regulation and developing economies' (2006) 34 *World Development* 884; Gunther Teubner, *Law as an autopoietic system* (Oxford/Cambridge, Blackwell Publishers 1993); and Gunther Teubner, *How the law thinks: toward a constructivist epistemology of law* (Springer 1990).

⁸⁰⁵ As explained in chapter 3, Gunther Teubner claims that three problems may arise when command and control regulations are used, which he calls the regulatory trilemma: 1) it might not have any influence on social conduct; 2) it may distort the practice through incompatible requirements; or 3) the ruling may lose its own consistency and coherence by attempting to incorporate other elements into its logic. Cf. Ralf Rogowski, *Reflexive labour law in the world society* (Edward Elgar Publishing 2013) 37.

harder.⁸⁰⁶ Such constraints will inevitably affect not only the company's investment capacity, but will also reduce its ability to attract partners and potential interested investors.

The governance of operational committees, in turn, is problematic for potential investors because PPSA holds a 50% share despite not contributing capital. Petrobras' participation is equally high, amounting to a minimum 30%. If these two state-owned companies act jointly on the operational committee they will at least hold an 80% share, which leaves other potential interested investor companies with the remaining 20%. Considering that these investor enterprises are not allowed to operate in pre-salt and strategic areas, one can infer that they would therefore be contributing financially to a venture in which they do not have significant decision-making power and cannot hold operational activities. In other words, they face the risk of writing blank cheques to Petrobras and PPSA, as alluded to by Statoil's Vice-President, Mauro Andrade.⁸⁰⁷

If this situation is negative for investors, it gets worse taking into account the two types of agency problems that arise from the governance setting of operational committees. The first involves Petrobras, as exclusive operator, and all other members of the operational committee. The Brazilian national oil company will have relevant information from its operational routine as operator that will not necessarily be available in the required detail to its partners, unless it openly discloses it. Petrobras could actually have at certain times an incentive to hold back strategic data, since it can benefit from its prioritised access to information, at the expense of its partners. The other agency situation arises between PPSA, the agent in most deliberations because of its 50% share in the committee, and all other investor partners, Petrobras included.

The peculiarity of this second agency situation is that the agent, PPSA, holds less relevant information to take its decisions than one of the principals: Petrobras. Therefore, the Brazilian national oil company has a natural incentive to disclose all relevant information to PPSA that might affect its interests in this company's deliberations. Yet the same does not apply

⁸⁰⁶ Will Connors 'S&P Downgrades Brazil's Petrobras to Junk Status' *The Wall Street Journal* (New York) <<http://www.wsj.com/articles/s-p-downgrades-brazils-petrobras-to-junk-status-1441918321>> accessed 23 November 2015.

⁸⁰⁷ Interview with Mauro de Andrade, Vice-President of Statoil (Rio de Janeiro, 08 August 2013).

to all other companies of the consortium, since Petrobras would not have an incentive to unveil relevant information to PPSA that would benefit them. It could, for example, conceal important data about the commerciality of areas, at the expense of its partners. Such a strategy would make sense for the Brazilian NOC because it might be interested in postponing investments to concentrate upon other areas of the Brazilian pre-salt, where it does not have to pay the Special Participation Tax.⁸⁰⁸ While this strategy could be compelling for Petrobras, with heavy investment burdens and required to operate in the vast pre-salt domains, it would be disastrous for its partners who are normally interested in the fast recoupment of their investment.

PPSA, in turn, could also be aligned with Petrobras' strategy. The entity represents the government's interests on the operational committee and is also responsible for enforcing local content policy requirements. Hence, PPSA could perfectly agree with Petrobras' postponement strategy to allow the national industry of suppliers more time to adapt to a future forecasted increasing demand.⁸⁰⁹ As a government representative it could also be simply advancing the view that strengthening another state-owned company's financial situation in more attractive areas is more important than carrying on with capital disbursements in other less promising regions, in financial terms.

Therefore, the final message that this governance setting sends to potential investors is that while Petrobras and PPSA jointly have major deliberative power, agency problems also impel the Brazilian NOC to hold back important information from its partners, while in some situations there are even incentives for it to strategically act together with PPSA at the expense of other consortium members. If such scenario was already negative with oil price barrel over US\$ 100 it becomes unsustainable with the price plunge below US\$ 50 at the end of August 2015.

⁸⁰⁸ In areas under the Onerous Relinquishment Regime, according to Law 12,276, as detailed in chapter 2, Petrobras does not incur in payments of the Special Participation Tax.

⁸⁰⁹ See discussions of local content policies in chapter 6.

The expected drawbacks in terms of production are equally important. They essentially derive from the operational exclusivity, the consequent lack of competition it entails, and from the local content and pricing policies being applied in the country in recent years.

Petrobras' lack of resources to exploit on its own the vast pre-salt region affects Brazilian production levels because other companies could be contributing to the endeavour if the operational exclusivity did not exist. Moreover, the exclusivity actually confers to Petrobras a *de facto* monopolistic condition in pre-salt and strategic areas, which entails a consequent loss of competitive references, affecting its dynamism.

Local content policies as applied in Brazil negatively impact production levels since they increase cost at the upstream sector and cause substantial delays. Despite the validity of such initiatives as a way to develop the national industry, the Brazilian policy's lack of focus and of any phasing-out strategy hinders its consistency, leading the national industry of suppliers to resiliently depend on the captive market created by the protection it entails, at the continuing expense of production in the upstream sector. One of the essential logics of local content policies is to admit a short-term inefficiency to the benefit of a development goal which compensates for it in the long-term.⁸¹⁰ Yet this rationale is absent in Brazil, which simply stays with the supposedly temporary incurred costs.

Petrobras' pricing policies equally impact on production capacity. The company had been diverting until the second semester of 2014 resources from the lucrative upstream sector to the less promising downstream segment because of the requirements to cope with an increasing demand that has arisen from reduced and subsidised prices at this level.⁸¹¹ This shift has reduced the upstream production potential, which is the company's core business sector.

The shortcomings of the current regulatory framework on technology and innovation are in principle more harmful than on production and investments for their rather enduring and protracted effects. Drawbacks on these variables can be offset more easily than on technology

⁸¹⁰ Silvana Tordo, *National oil companies and value creation* (World Bank Publications 2011) 9.

⁸¹¹ Edmar Luiz Fagundes de Almeida, 'Seminário GEE2013: Os Desafios da Energia no Brasil' (2013).

and innovation since they respond faster to their respective institutional settings and any modification or adjustment related to these parameters can be more easily implemented, if compared to technology and innovation. Because of lock-in and path dependency effects, technology is significantly dependent on past experiences and choices, which tend to affect future outcomes more intensively than the other two variables.

Further to this tendency to long-lasting effects, the current policies that lead to negative impacts on technology and innovation are also departing from a previous successful historical path, which has led the Brazilian oil industry to occupy a prominent international role in deep water oil exploitation. That outcome largely resulted from past strategies with substantial state support, which has varied and adapted in time to adjust to the different contexts. Hence, the move to offshore exploration through the development of in-house technology in the 1970s was only possible because of the essential state steering role, as well as its backing and assistance in providing the required investment amounts. Yet in 1997, when in need of increasing international investment to share the risks of exploring the Campos Basin, substantial reforms were implemented to the state's intervention model in the sector, allowing for private and state capital partnerships.

Unfortunately, the 2010 reform departs from this successful and adaptable stance of state intervention, since it provides an excessively intrusive and rigid approach that limits the versatility required by technological developments in mutable and changing environments. Petrobras has thus been overwhelmed by stringent national content policies without focus and strategic planning, which have been affecting its ability to form and engage in technologically advanced networks of suppliers. The excessive use of the national oil company as a means to propel national providers' innovative standards is hindering, instead, Petrobras' developments in the area, without credible signs of meeting its target. The 2010 provisions equally thwart effective initiatives of risk sharing, collaboration and interchange with leading international oil companies and stakeholders. This constraint limits the required progress from the current

prevailing assimilative and imitative techniques of the Brazilian oil industry towards an essentially pro-active innovation stance that dictates future standards for the oil industry.

All these drawbacks in terms of investments, production and technology-innovation could in theory be justifiable if the main state goal of ensuring and increasing strategic control over oil could be attained and vindicated, thus compensating for these disadvantages. Yet that is not the case. The current regulatory framework only allows an increasing strategic control over oil production in some very limited circumstances, mainly through PPSA's influence in decisions at the operational committee of consortia exploring oil in Brazil. This possibility could have easily been attained through the use of the state's voice in Petrobras or even via ANP's oversight roles in the oil sector. In other words, the same governmental goal of exerting increasing influence and control over oil production could have been reached in a manner that would have avoided all the previously mentioned shortcomings.

Paradoxically, the 2010 reforms can actually diminish the state's strategic control over oil in Brazil in some situations, instead of increasing it. Since to a great extent the national oil policy now depends on one single company, Petrobras, most of the decision making in the sector will mainly vary according to this corporation's own possibilities, instead of being determined by governmental decisions, according to national priorities. Therefore, essential deliberations in the Brazilian oil sector such as the resolution to explore a certain new block in the pre-salt region will essentially depend on Petrobras' capacity because of the operational exclusivity. The recent corruption scandals that substantially affected the company's finances highlighted such limitations of the Brazilian regulatory framework and its excessive dependency on one sole company. Because of Petrobras' difficult financial situation as a result of the scandals and its impacts on the company's ability to raise funds in financial markets, prospects for further exploration activities in pre-salt and strategic regions are very limited and improbable. Unless the government contemplates a change in current regulations, it will not be able to organise future public tenders in the Brazilian pre-salt in the short term simply because

Petrobras cannot financially and operationally cope with further ventures given its current situation.

As previously mentioned, the cited drawbacks of an excessively intrusive regulatory model can all be broadly categorised according to shortfalls coming from unintended side effects; the lack of collaboration of affected stakeholders; or an increase in monitoring and transaction costs. Based upon this inference, the proposals advanced in chapter 9 attempted to mitigate such aspects, advocating suggestions that avoid intrusiveness and authoritative commands which ignore the environment to which they apply. Rather, the option has been for a versatile regulatory approach, through solutions that take into account the oil sector's dynamic and mutable feature. The understanding is that the responsive and reflexive theoretical frameworks are more adequate to the changeable nature of the oil industry, since they allow for a degree of flexibility and promote fertile interactions between the different involved stakeholders.

Within this setting, the proposal for suppression of the operational exclusivity seeks to diminish the non-intended side effects caused to investment, production and technology-innovation, aiming also to regain the collaboration of other international oil companies and their supplier enterprises towards an increasingly participatory and inclusive model which would allow for several companies to operate in pre-salt and strategic areas. Similarly, against this backdrop of mitigating fallouts from an interfering approach comes the suggestion for PPSA's elimination, which is expected to contribute to a better governance structure within operational committees, with the suppression of their agency and moral hazard problems and a clearer delimitation of competences among institutions of the Brazilian oil sector.

The proposed change in local content regulations has the same overall concern of reducing unintended side-effects and also aims at diminishing the excessive monitoring and transaction costs of the current policy. Therefore, its main goal is to provide the adequate incentives for local companies to gain long-term competitiveness in specific targeted sectors where the country holds competitive advantages, rather than establishing mandatory

purchasing levels of national content to a wide range of products without prior consideration of whether they can eventually become internationally competitive. The current obligations significantly increase monitoring and transaction costs, since they demand complicated and bureaucratised procedures for calculating the national percentage of goods, which in turn require strict surveillance and control over their enforcement.

Hence, the logic of the recommendations is of encouraging and stimulating, rather than protecting and requiring, in line with a less intrusive regulatory approach. The proposal of previously announcing that companies buying local be offered a bonus in public tenders attempts to incorporate such rationale. It seeks to promote an effective competition between oil firms for increasing local acquisitions. The suggestion for all purchases of oil companies and their suppliers be notified to ANP through the completion of an electronic spread sheet, in turn, would most certainly reduce monitoring costs. It would allow the regulatory agency to be constantly informed of the evolution of local sales, enabling it to take prompt action whenever required, simply by checking an electronic system. The recommendations attempt to encourage a progressive adjustment of supply and demand for local products and services, avoiding stringent requirements that overburden purchasers, at the overall expense of the industry.

Finally, the suggestions directed to Petrobras have the essential goal of creating effective mechanisms for reducing the government's inappropriate interference in the company. The first proposal aims at reducing the conflict of interest of government board members by requiring them not to hold state commanding positions.⁸¹² The second recommendation is for the national oil company to allow its price to freely fluctuate within an established band around international prices. The goal is to confer predictability on industrial stakeholders, avoiding excessive variations, while also ensuring that disproportionate internal price distortions that affect firm profitability will not be tolerated.

In spite of all these aspects, the Brazilian regulatory framework also has certain positive features that do not require change. The two most important ones are the creation of the Social

⁸¹² State commanding positions in Brazil are known as "cargos de DAS"(Direção e Assessoramento Superior).

Fund and a clearer and increasing delimitation of competences between regulatory entities of the oil sector.⁸¹³ The Social Fund marks a valuable shift in Brazilian energy policy priorities, since it for the first time provides a significant set of consistent programmes and actions with social and development purposes. Beyond its intrinsic value in reducing social disparities in an extremely unequal country with dismal social indicators, the fund also reveals substantial benefits for the variables analysed in the thesis.

The Social Fund contributes to reducing one typical problem of oil exporting countries: the “resource curse”, also known as “paradox of the plenty theory”.⁸¹⁴ The theory advocates that commodity exporter countries tend to rely disproportionately on oil revenues, while their industries, infra-structure and social standards are not adequately developed. The Fund mitigates such risk by guaranteeing that resources will be directed to education, science, technology and development, therefore contributing to an overall increase of the country’s productivity levels.⁸¹⁵

The 2010 reform also clarified institutional competences, increasing transparency and centralising formulation and planning functions at entities directly linked to the Presidency. This contributes to institutional design, enhancing checks and balances between different state bodies and gives further predictability to stakeholders. These positive aspects are certainly commendable and should be further stimulated.

Despite such specific advantages of the 2010 reform, the general conclusion is that the changes only contribute to its main goal of asserting increasing strategic control over oil in very limited circumstances, which could have been avoided, while revealing, in turn, substantial drawbacks in essential variables to the sector. The overall outcome that was certainly negative and un-rewarding in 2010 becomes even worse in a context of oil prices below US\$ 50.00 per barrel since investments will shrink even further in tandem with Petrobras’ financial problems.

⁸¹³ Such inference is not absolute, since the creation of PPSA, for example, led to a confusion of competences instead of a more transparent and clear-cut separation.

⁸¹⁴ Cf. for example, Macartan Humphreys, Jeffrey Sachs and Joseph E Stiglitz, *Escaping the resource curse* (Cambridge University Press 2007).

⁸¹⁵ Even though the risk of Brazil facing a resource curse is limited, as explained in chapter 2, it is always praiseworthy to count with effective mechanisms that mitigate even further this possibility.

There are initial signs that some of the shortcomings mentioned throughout the thesis are already beginning to occur. Regarding investments, for example, in the first bidding round in the pre-salt region on 21 October 2013, when the Brent oil price was high, around US\$ 109 per barrel,⁸¹⁶ only 11 companies registered their interest. The Government was expecting at least 40 interested companies to register, since the pre-salt region is considered the most promising oil area in Brazil.⁸¹⁷ Only one bid was made at the public tender and the amount of profit oil to the government was established at the minimal initial level.

In the 13th bidding round, two years later, under the concession regulatory framework, the results were equally unsatisfactory. The government had been expecting bonuses to reach a figure between R\$ 1 and 2 billion but the tender only collected R\$ 121.1 million. Moreover, only 37 of the 266 blocks were acquired and for the first time in history Petrobras did not participate in the public tender.⁸¹⁸ Of course, to a great extent the results of this bidding round reflect the depressed oil prices and the increasing difficulties of Petrobras because of the corruption scandals and the recession scenario of the Brazilian economy. One could thus argue that they are not directly linked to the 2010 legal reforms, especially because the tender was conducted under the concession regime. Yet it is unquestionable that the specific features of the Brazilian regulatory framework also played a role in such outcome, considering how they affect Petrobras' financial situation and its investment capacity.

In production terms, evidence equally suggests that Petrobras has been shifting focus from the Campos Basin, where Law 9,478 is in force, to the Santos Basin, located in pre-salt domains. Such priority shift is probably the reason for the significant production plunge in the former area, not yet offset by upticks in the latter region. The resource rearrangement could also explain Petrobras' annual output dip between 2012 (2% decrease) and 2013 (1.6%

⁸¹⁶ US Energy Information Administration available at:

<http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RB RTE&f=M> accessed 20 May 2015.

⁸¹⁷ O Estado de Sao Paulo, 'Produção no pré-sal está abaixo da expectativa' O Estado de Sao Paulo <<http://economia.estadao.com.br/noticias/geral,producao-no-pre-sal-esta-abaixo-da-expectativa-imp-1116078>> accessed 11th of June 2014.

⁸¹⁸ Rodrigo Polito e André Ramalho 'Petrobras fica de fora e leilão da ANP arrecada apenas R\$ 121 milhões' *Valor Econômico* (Rio de Janeiro) <<http://www.valor.com.br/brasil/4261746/petrobras-fica-de-fora-e-leilao-da-anp-arrecada- apenas-r-121-milhoes>> accessed 23 November 2015.

drop).⁸¹⁹ Absent the operational exclusivity requirement, most certainly other oil companies would be operating in pre-salt domains, mitigating Petrobras' redeployment of resources from the Campos Basin.

The recent corruption scandals that affected Petrobras and the context of depressed oil prices will certainly exacerbate most of the shortcomings already discussed, leading to increasing questionings and debates on the suitability of the current regulatory model. Most importantly, however, what the recent crisis reveals is that an excessively intrusive model disproportionately dependent on one single firm is risky because the expected pay-offs of corruption increases and the whole oil sector can be significantly affected by problems with the national oil company. The moment is extremely relevant for discussions such as the one provided in this thesis. Public debate and scrutiny should be further stimulated not just as a general principle of justice⁸²⁰ but also as an essential means to attain a better regulatory framework with effective conditions of contributing to the country's development.

⁸¹⁹ <http://www.petrobras.com/en/magazine/post/2013-net-income-of-r-23-57-billion.htm/> accessed 18 August 2014.

⁸²⁰ Amartya Sen, *The idea of justice* (Harvard University Press 2011).

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APPENDIX

REGULATORY REGIMES FOR EXPLORATION AND PRODUCTION OF OIL

The main goal of this section is to study the types of existing regulatory oil regimes in the world. Regulatory regime will be here understood as the set of laws, administrative decisions, rules and practices designed for regulation of the oil activities in a certain country.⁸²¹

The literature on regulatory regimes for the oil sector is by no means convergent. Most specialists stress the extreme difficulty in establishing a long-lasting and uniform classification of regulatory models, given that national variations inevitably occur and that regulations tend to change over time.

Moreover, different political-legal systems and the peculiarities of each national oil industry shape them in diverse and specific manners and often countries tend to use hybrid models, whereby they merge distinct aspects of regulatory regimes.⁸²² For this reason, many of the recent studies related to the analysis of regulatory frameworks in the oil sector have been done using national contexts as a starting analytical point. Another common feature in the field is to assess the different regulatory frameworks essentially through the types of allowed contracts between states and exploring firms.⁸²³ This peculiarity often leads to some imprecision and to a certain degree of generalisation.

Daniel Johnston, taking into account the different institutional, legal, fiscal and contractual settings, establishes one of the classical categorisations for regulatory regimes in the oil sector.⁸²⁴ According to him, they can be classified into concession and contractual systems. Bernard Taverne also distinguishes between licence and contractual regimes according to the types of authorisations granted to explore oil activities. Despite the utility of

⁸²¹ Cf. Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 115.

⁸²² Ibid. 21,42.

⁸²³ Cf. Ibid. and Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011).

⁸²⁴ Daniel Johnston, *International petroleum fiscal systems and production sharing contracts* (PennWell Books 1994).

these classifications, they have one major drawback, which is to ignore that concession (licence) regimes can also be built upon contracts.⁸²⁵ Moreover, both authors agree that the main difference between the two systems is related to the property of the extracted oil.⁸²⁶

For these reasons, the categorisation here established for the different regulatory oil regimes will be based on a three tier analytical system used by Mauricio Tiomno Tolmasquim et al. considering: i) the types of contracts; ii) the existence of state participation; iii) exclusivity of state exploration and production.⁸²⁷

Most specialists in the field tend to consider the existence of four (4) different types of contracts in the oil sector for exploration and production purposes: Concession, Production Sharing Agreements(PSA), Joint-Ventures (JV) and Services.⁸²⁸

The following analysis will have the different types of existing contracts for exploration and production of oil as a starting point for defining the different regimes, since it is where most of the differences are located. From there on, the study will consider the other analytical levels.

⁸²⁵ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 22.

⁸²⁶ Ibid. 21.

⁸²⁷ Ibid. 24

⁸²⁸ Cf. Michael Likosky, 'Contracting and regulatory issues in the oil and gas and metallic minerals industries' (2009) 18 *Transnational Corporations* 1; Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 115,159; and Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011).

Concession regimes are the oldest type of oil agreements and have been used since the beginning of the 20th century. The modern concession frameworks are very different from the old versions, since this type of agreement has evolved significantly through time. In concession contracts the property of the extracted oil belongs to the concessionaire company, which is used to recover its costs and profits. Concession contracts normally last between 30 to 40 years and they often involve mandatory exploration work programmes, the payment of ordinary taxes, royalties and cash bonuses.⁸³⁰

The mandatory work programme is normally one of the elements of the bidding process and the continuation of the concession after an initial phase is usually linked to its satisfactory fulfilment. Royalties are payments calculated as a percentage of oil produced by the concessionaire and are normally payable in cash. Cash bonuses are amounts owed to the state at certain times during the contract, normally when it is signed (Signature Bonuses), or when the production reaches a certain amount (production bonus). Cash bonuses and royalties are also usually elements of the competitive bidding.

Concession regimes can be classified into two types: the pure regimes and those with state participation, which usually takes place through a state-owned enterprise that becomes, consequently, a co-concessionaire.⁸³¹ The concession model is used in Brazil under Law N.9.478, the Petroleum Law. Oil exploration and production in the United States, Australia, the United Kingdom, Argentina and Colombia also take place through the pure concession system.

⁸²⁹ Cf. Michael Likosky, 'Contracting and regulatory issues in the oil and gas and metallic minerals industries' (2009) 18 *Transnational Corporations* 1; Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 115,159; Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); and Daniel Johnston, *International petroleum fiscal systems and production sharing contracts* (PennWell Books 1994).

⁸³⁰ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 31.

⁸³¹ Ibid. 31,33.

Examples of the concession regime with state participation can also be found in the Netherlands, Norway and the United Arab Emirates.⁸³²

2. PRODUCTION SHARING REGIMES (PSR)⁸³³

In production-sharing regimes (PSR) the extracted oil is considered state property. The produced volume is shared with the contracted firm for the recovery of its exploration and production costs as well as for the payments made for government participations and taxes. The so called “Cost Oil” is the production amount transferred to the contracted company for the recovery costs (for development, exploration, operation and abandonment). The rest of the production quantity is called “profit oil”. The profit oil will be shared between the contracted company and the government according to the established contractual conditions.⁸³⁴

At the beginning of the production phase the amount of cost oil tends to be significantly higher, since the contracted company has increasing costs when operations are launched. At the end of the Production Sharing contract the cost oil is reduced and the profit oil tends to increase. The Production Sharing model has been used in Brazil since 2010, in subsalt layers and in areas considered to be strategic, governed by Law 12,351. Indonesia, Angola, Azerbaijan, Casakistan, India, Libya, Nigeria and Russia are other examples of countries to use this regime.⁸³⁵

⁸³² Ibid. 31,33.

⁸³³ Cf. Michael Likosky, ‘Contracting and regulatory issues in the oil and gas and metallic minerals industries’ (2009) 18 *Transnational Corporations* 1; Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 115,159; Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); and Daniel Johnston, *International petroleum fiscal systems and production sharing contracts* (PennWell Books 1994).

⁸³⁴ Normally the share of the profit oil is defined in competitive bidding procedures, whereby companies compete, offering higher percentages of the share.

⁸³⁵ Cf. Michael Likosky, ‘Contracting and regulatory issues in the oil and gas and metallic minerals industries’ (2009) 18 *Transnational Corporations* 1; Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 115,159; Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); and Daniel Johnston, *International petroleum fiscal systems and production sharing contracts* (PennWell Books 1994).

3 JOINT VENTURE REGIMES (JV)⁸³⁶

Joint Venture (JV) agreements are also called “Association Contracts”. In these contracts, the host state, normally through state-owned companies, act jointly with other firms in exploration and production activities, allocating costs and risks according to each ones’ agreed contractual shares. Some countries like Nigeria allow joint ventures to be formed through consortia and business contracts, while others, for example Venezuela, require them to formally establish a new business enterprise.⁸³⁷

The main difference between JV and PSR is that while in the former the state participates directly in the undertaking, investing and sharing risks, in the latter it does not. In Joint Venture agreements, moreover, the participation in financial results of the association will be split according to each company’s shares.

4 SERVICES REGIMES⁸³⁸

In service regimes the state signs a contract with an oil company, which explores and extracts the oil and will receive an agreed financial compensation for these services. This type of regime usually takes place in regulatory frameworks where the state has exclusive exploration and production rights over oil, and, therefore, the extracted oil is considered state property. In these cases, normally a state-owned company also performs these activities and the use of service contracts provides a possibility to have other companies in oil activities without having to change laws or constitutional provisions where state exclusivity is granted.

⁸³⁶Cf. Michael Likosky, ‘Contracting and regulatory issues in the oil and gas and metallic minerals industries’ (2009) 18 *Transnational Corporations* 1; Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 115,159; Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); and Daniel Johnston, *International petroleum fiscal systems and production sharing contracts* (PennWell Books 1994).

⁸³⁷ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 35.

⁸³⁸ Cf. Michael Likosky, ‘Contracting and regulatory issues in the oil and gas and metallic minerals industries’ (2009) 18 *Transnational Corporations* 1; Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 115,159; Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); and Daniel Johnston, *International petroleum fiscal systems and production sharing contracts* (PennWell Books 1994).

There are two types of service regimes: with or without risk. In the first case, also known as pure service regime, the company has its costs reimbursed and also receives a fee, which is considered the firm's capital payout. In the second case, the contracted firm is paid according to its performance or receives a financial share of the production amount. This system is used as a way to stimulate the firm to control its costs, reducing as a consequence the moral risk.

5 COMPARISONS BETWEEN OIL EXPLORATION REGIMES⁸³⁹

No one type of regime can be considered superior to others since they all reveal certain advantages and drawbacks, depending on the situation. Maybe that is the reason for the tendency of oil producing countries to allow for two or more types of contracts, or even to use hybrid models combining them. Brazil is an illustrative example, where production sharing agreements apply to subsalt layers and in areas considered to be strategic, while concession contracts are used elsewhere.⁸⁴⁰ The following countries also adopt these two regimes: Russia, Oman, Thailand, Vietnam, Algeria, Angola, Congo and Nigeria.⁸⁴¹

Concession regimes are generally more attractive to international oil companies because they have property of the extracted oil and are able to negotiate it in their best interest, taking into account the most suitable market conditions. According, for example, to their forecasts for the price of oil, they can decide to store the product or sell it in higher volumes. Another advantage that property gives is the possibility of registering the production capacity of a certain concession area in the company's accountability, which will in turn facilitate its capacity to attract financial resources through loans and investments, for example. Even though this registration technique is possible in PSRs, through a contractual mechanism called "entitlement

⁸³⁹ Cf. Michael Likosky, 'Contracting and regulatory issues in the oil and gas and metallic minerals industries' (2009) 18 *Transnational Corporations* 1; Bernard Taverne, *Petroleum, Industry, and Governments: An Introduction to Petroleum Regulation, Economics, and Government Policies* (Kluwer Law International 1999) 115,159; Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); and Daniel Johnston, *International petroleum fiscal systems and production sharing contracts* (PennWell Books 1994).

⁸⁴⁰ The onerous relinquishment regime is also in force in some regions of the pre-salt basin.

⁸⁴¹ Nadine Bret Rouzaut and Jean Pierre Favennec, *Petóleo & Gás Natural: Como Produzir e a que Custo* (Synergia 2011) 230, 232.

oil”⁸⁴², which guarantees property transference, this instrument is less certain and more risky than the property that concessionaires hold, which normally are inserted in laws.⁸⁴³ Moreover, differently from concession agreements, PSR gives entitlement to only part of the production. Therefore, the firm will benefit less from its reserves for financial leveraging purposes compared to firms in a concession agreement.

From the government’s perspective, pure concession agreements are favoured because all the risks are borne by concessionaire companies and if oil is successfully extracted it can receive revenues through royalties, cash bonuses and other ordinary taxes. In concession contracts with state participation the government will face part of the risk according to its share in the undertaking. The same will happen in joint venture agreements, where the state’s risk will be proportionate to its share in the agreement.

In PSR, even though exploration and operational risks are borne by international oil companies, if successful in extracting oil, they are reimbursed. This reimbursement certainty imposes a higher burden on governments if compared to concession agreements, especially at the initial production stages, when the investment amounts and costs tend to be significantly higher. Exactly the opposite happens towards the end of the contract. As a result, state financial revenues tend to vary significantly in time in PSRs, compared to other regimes, where revenues are likely to be more constant. Another consequence of this cost recovery is that it imposes higher monitoring and auditing duties on government officials, since companies may face an incentive to inflate their costs,⁸⁴⁴ in view of inherent contractual moral risks.

Since concession regimes do not have a cost reimbursement guarantee, companies will have to assess more precisely the probability of oil findings beforehand, considering whether future revenues will allow the recovery of these expenses. This uncertainty may negatively

⁸⁴² Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) 39.

⁸⁴³ Having the property defined in legislation confers more certainty and guarantee to owners because breaking the law is considered worse than breaking a contract.

⁸⁴⁴ Cf. Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) and Carlos Jacques Viera GOMES and others, ‘Avaliação da proposta para o marco regulatório do pré sal’) 64 Centro de Estudos da Consultoria do Senado federal Textos para discussão.

impact on their bidding offers to certain areas, especially those with insufficient information about the conditions of the explored areas.

In pure concession agreements the level of state intervention over the production and operational activities is minimal and may only take place through the rhythm of block offers via public auctions and through the approval of working and development plans.⁸⁴⁵ Concessions with state participation obviously allow the government to exert more control over operational activities. In PSRs and JVs the government interference increases, since usually a state-owned enterprise represents it in the negotiations with partners and can more easily discuss contractual terms and conditions of each venture. In JV the state company may also participate directly in operational activities while in PSRs this is seldom the case.⁸⁴⁶

Another considerable advantage of PSR's from the government's perspective is the strategic control of supply of oil that it allows without demanding investment efforts, since a percentage of the production will always belong to the state. The downside of this control is that it increases transaction costs for commercialising this oil. It may also demand the creation of a state-owned company to perform this task on the government's behalf, increasing also bureaucratic costs.⁸⁴⁷ Service regimes and systems of exclusive state exploration and production allow for the greatest control and governmental interference over activities.⁸⁴⁸ While in the second case the reasons are obvious, in the first, normally services are contracted through state-owned enterprises allowing for a strict follow-up of operational routines.

⁸⁴⁵ Cf. Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) and Carlos Jacques Viera GOMES and others, 'Avaliação da proposta para o marco regulatório do pré sal' 64 Centro de Estudos da Consultoria do Senado federal Textos para discussão, 2009).

⁸⁴⁶ Cf. Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011); and Carlos Jacques Viera Gomes and others, 'Avaliação da proposta para o marco regulatório do pré sal' (Centro de Estudos da Consultoria do Senado federal Textos para discussão, 2009).

⁸⁴⁷ Cf. Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011) and Carlos Jacques Viera GOMES and others, 'Avaliação da proposta para o marco regulatório do pré sal' 64 Centro de Estudos da Consultoria do Senado federal Textos para discussão, 2009).

⁸⁴⁸ Mauricio Tiomno Tolmasquim and Helder Queiroz Pinto Junior, *Marcos regulatórios da indústria mundial do petróleo* (Synergia 2011).

One final distinction should be made between concessions and all the other regimes. Even though some concessions require the signature of a contract, such as in Brazil under Law 9,478, they are generally granted through licences, which are regulated by specific legal provisions. The other systems are usually less meticulously detailed in statutes and tend to have their major aspects established in signed contracts instead of laws. Therefore, states normally face lower litigation risks in concession regimes since they can rely more on laws for potential disputes, instead of contracts, where they stand in an equal situation with opposing parties.⁸⁴⁹

⁸⁴⁹ Carlos Jacques Viera GOMES and others, 'Avaliação da proposta para o marco regulatório do pré sal') 64 Centro de Estudos da Consultoria do Senado federal Textos para discussão.

ANNEX I: LIST OF INTERVIEWEES

- 1) Andrade, Mauro; Vice-President of Statoil (Rio de Janeiro, 08 August 2013).
- 2) Bogniotti, Lauro; Ministry of Mines and Energy (Brasilia, August 2013).
- 3) Chauhan, Virendra; Oil Analyst in Energy Aspects (London, 07 February 2014).
- 4) David, Olavo Bentes; Deputy Attorney General of the National Petroleum Agency (ANP) (Rio de Janeiro, 24 July 2013).
- 5) Fonseca, Maria; Former oil specialist of the National Petroleum Agency (ANP) (Rio de Janeiro, August 2013).
- 6) Frazao, Rafael; Former Deputy Director of Gas of Petrobras (Rio de Janeiro, August 2013).
- 7) Guedes, Armando; Former President of Petrobras (Rio de Janeiro, 21 July 2012).
- 8) Jacques, Carlos; Adviser at the Brazilian Senate (Brasilia, July 2012).
- 9) Kinue, Alice; Former oil specialist of the National Petroleum Agency (ANP) (Rio de Janeiro, August 2013).
- 10) Lima, Paulo Cesar Ribeiro. Adviser of the Brazilian Chamber of Deputies (Brasilia, July 2013).
- 11) Lucca, Joao de; President of the Brazilian Petroleum Institute (IBP) (Rio de Janeiro, 05 August 2013).

12) Macedo, Tiago; Attorney General of the National Petroleum Agency (ANP) (Rio de Janeiro, 23 August 2013).

13) Maciel, Diana Amendoeira; Legal Specialist of Statoil (Rio de Janeiro, 08 August 2013).

14) Mauro, Jose; Research Specialist of of the Brazilian Institute of Applied Economic Research (IPEA) (Brasilia, August 2013).

15) Melo, Teresa; Former Manager of ANP, Petroleum and Natural Gas Specialist MPX Energia (Rio de Janeiro, 23 July 2013).

16) Neto, Jose Botelho; Director of the Secretariat of Oil and Gas of the Brazilian Ministry of Mines and Energy (MME) (Brasilia, 02 August 2012).

17) Neto, Watt Artur; Legal Coordinator of Strategic Issues of the National Petroleum Agency (ANP) (Rio de Janeiro, 23 August 2012).

18) Oliveira, Daniel; General Attorney Office of the National Petroleum Agency (ANP) (Rio de Janeiro, 23 August 2012).

19) Orlandi, Luis; Oil Consultant (Rio de Janeiro, August 2013).

20) Pinto Jr., Helder Queiroz; Director of the National Petroleum Agency (ANP) (Rio de Janeiro, August 2013).

21) Pontes, Clayton; Minstry of Mines and Energy (Brasilia, August 2013).

- 22) Renault, Afredo; Superintendent of the National Organisation of the Petroleum Industry (ONIP) (Rio de Janeiro, 20 July 2012).
- 23) Rodrigues, Flavio Ofugi; Director of Governmental Relations and Regulatory Affairs of Shell Brasil (Rio de Janeiro, 22 July 2013).
- 24) Rodrigues, Juliana; Assistant to the General Coordinator of Energy of the Brazilian Ministry of Finances (Brasilia, July 2013).
- 25) Rossi, Joao Luis; General Coordinator of the Brazilian Ministry of Development Industry and Trade (MDIC) (Brasilia, July 2013).
- 26) Rzazinski, Henrique; Energy consultant and former BMG employee (Rio de Janeiro, 08 July 2013).
- 27) Sales Jr., Rosalvo; CEO of Kromav Engineering (Rio de Janeiro, July 2013).
- 28) Sauer, Ildo; Former Director of Petrobras (Sao Paulo, July 2013)
- 29) Sen, Amrita; Chief Oil Analyst in Energy Aspects (London, 07 February 2014).
- 30) Soares, Jossifram; General Coordinator of Energy of the Brazilian Ministry of Finances (Brasilia, July 2013)
- 31) Sousa, Rodrigo; Oil Specialist Booz&Co (Sao Paulo July 2013).
- 32) Vicente, Tiago; Director of Governmental Relations and Regulatory Affairs of Shell Brasil (Rio de Janeiro, 22 July 2013).

33) Vieira, Luciana; Executive Secretary of of the National Petroleum Agency (ANP) (Rio de Janeiro, August 2013).

34) Zylbertajsn, David; Former Director of of the National Petroleum Agency (ANP) (Rio de Janeiro, 23 August 2012).