Reserves certification: the current scenario of the largest oil producing countries in the world and Colombia

CERTIFICAÇÃO DE RESERVAS: O ATUAL CENÁRIO DOS MAIORES PAÍSES PRODUTORES DE PETRÓLEO E DA COLÔMBIA

Resumo:
Certificação de reservas, um dos tópicos mais controversos na indústria do petróleo, é a confirmação do volume existente de óleo e gás por meio de uma auditoria executada por uma empresa de consultoria independente para as empresas de petróleo. Existem diferentes maneiras para a certificação de reservas, dependendo do país ou da região em que o óleo está sendo produzido. O propósito deste artigo é mapear os diferentes sistemas existentes para a certificação de reservas nos quinze países maiores produtores de petróleo e na Colômbia, que não é um grande produtor, mas tem uma recente e confiável regulação para certificação de reservas. O método aplicado foi baseado em pesquisa na literatura relacionada ao tema e em análise comparativa dos dados. Após análise das informações obtidas, constatou-se que a maioria dos países não seguem regulações específicas para certificação de reservas. Concluiu-se que existe a necessidade de um sistema universal preciso para a certificação de reservas.
Palavras-chave: Certificação de reservas; Certificação; Reservas de óleo; Regulação

Abstract:
Reserves certification, one of the most controversial topics in the oil industry, is the confirmation of the existing volume of oil and gas by means of an audit implemented by an independent consultancy company for the oil companies. There are different ways to certify reserves; that will depend on where the oil is produced. The purpose of this paper is to map the existing systems used for reserves certification in the fifteen largest oil producing countries in the world and Colombia, which is not a major producer but has a recent and reliable regulation for reserves certification. The method applied was based on literature search about the subject and comparative analysis of data. After analyzing the information obtained, it was found that most countries do not follow specific regulations for reserves certification. In conclusion, there is a need for an accurate universal system for reserves certification.
Keywords: Reserves certification; Certification; Oil reserves; Regulation.

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Introduction

The Ninth Amendment of the Constitution of 1995 put an end to the Brazilian monopoly of the oil industry. Later, in 1997, Law number 9478, also known as the Petroleum Law, designed to regulate the oil and gas sector, was passed. This law established the creation of the National Agency of Petroleum (ANP), later called National Agency of Petroleum, Gas, and Biofuels. ANP draws up the guidelines for the oil industry, although, after sixteen years, there have been some gaps in the regulatory system that need to be discussed.

According to McLane and Rose (2001), "The assets of an oil company consist mostly of oil on earth." When oil resources can be technically and economically exploited, they are called reserves. The amount of reserves of a company demonstrates the potential for economic growth, meaning that the company can raise funds in a publicly traded scenario. OGX Petróleo e Gas S.A. ("OGX") is a Brazilian company, which raised 6.7 billion reais (Anacleto, 2014) in the financial market by announcing, after exploratory studies, large reserves that subsequently proved to be smaller than they were.

There is no specific guideline internationally used to evaluate and certify reserves. Industry, government, and financial markets require this kind of information; however, there is neither a clear, objective agreed way to calculate them nor any unique legislation.

The exploratory nature of this research focuses on finding answers to the existing problem. Therefore, a review of literature on the subject was performed. The main results of the research identified the current state of the concepts and certification processes in the world's leading oil producer countries and Colombia and found a regulatory gap in reserves certification and the effects of the lack of convergence in definitions within the government, business, and financial settings.

State of the art

Oil reserves have extreme importance in the oil industry. The value of an oil company comes from its reserves. According to McMichael (1997), *"Oil reserves are one of the key elements of the international oil industry."* While AlBahar (2011) says, "*Resources and oil and gas reserves are the greatest assets that any company, domestic or international, can possess*."

However, for dos Santos (2011), *"The concept of hydrocarbon reserves, absolutely fundamental to the oil industry, is complex*." In addition, Rovillain (2014) states, *"Currently the oil and gas companies are based on two pillars: the ability to evaluate, retrieve and review their reservations, as well as the ability to produce these reserves in an economically sustainable way*."

The complexity is the result of various aspects that underlie the concept of reserves, which can be divided into three parts: politics, market (business), and government. Rodriguez-Padilla (2013) made this division when he stated that

> "Reserves are the heart of the oil industry trust and credibility to ensure access to funds to develop projects and innovations that meet the growing demand. For the financial sector stocks, reserves are the value measure of an oil company and thus the foundation of their credit capacity. For exporting countries highly dependent on oil sales, like Mexico, it is particularly important to know how longer they can use this non-renewable natural resource as a development asset. The companies, economist, financial and public authorities speak of reserves but not always meaning the same."

The political character

Santos (2011) mentions the reliability of reserves calculations and says that many countries do not have independent audits to confirm them. As a result, the amount of oil or gas reserves in a country can be manipulated for global political or economic advantages, as there is no international certification body or standards to be followed, which is stated by Anacleto (2014).

The technical character

The technical view is perhaps the clearest, though it can be ambiguous. A number of deterministic and probabilistic definitions of reserves can be found in the literature. The deterministic definition assumes that it is necessary to know the value of each parameter to calculate. The probabilistic definition estimates in the form of series or statistical terms, confidence intervals or, more precisely, in prediction intervals. According to Thomas (2001), reserves are the *"fluid quantity that can still be obtained from an oil reservoir at any time of its productive life."* Ross (1997), a partner at Gaffney, Cline & Associates, a leading reserves certification company in the world, defines reserves in his article The Philosophy of Reserve Estimation as

> "volumes of oil, condensate, natural gas, liquefied natural gas and associated substances expected to be commercially recovered from known accumulations at a given date, under existing economic conditions for operational practices established under existing government regulation."

There is a variety of definitions for reserves. McMichael (1997), for example, defines reserves as *"amounts of oil that can be recovered from a given date from known reservoirs."* Other authors have different concepts, but all of them share the same idea of reserves being the part of oil resources that can be recovered at a specific time (Ferreira, 2009; Anacleto, 2014; Frank Janh et al., 2012; and Rosa, Carvalho and Xavier, 2006).

Coll and Elliot (2013) mentions SPE (Society of Petroleum Engineering) as an entity that bothered to draw up a reserve classification system in 1997, called Definition of Oil Reserves. In 2000 and later in 2007, this document was revised and now called Petroleum Resources Management System (PRMS). The PRMS was prepared by SPE in conjunction with the American Association of Petroleum Geologists (AAPG), the World Petroleum Council (WPC), and the Society of Petroleum Evaluation Engineers (SPEE). PRMS is defined as *"a fully integrated system that provides the basis for the classification and categorization of all oil reserves and resources."* This document establishes principles for definitions and evaluation of reserves and describes reserves as oil accumulations being planned to be commercially recoverable by application of development projects from a future date, under defined conditions. For Lee, Purewal, and Harrell (2012), *"PRMS quickly became the global standard setting for definition and classification of resources."*

The economic and business character

An analysis of the concepts used by the market must be made according to what is published by the bodies that govern this sector. There are some agencies such as CSA (Canadian Security Administrators), UK Statement of Recommended Practices, and the SEC (United State Securities Exchange Commission), whose mission is to *"protect investors, maintain fairly, orderly and efficient market and facilitate the capital formation"* (ESA, 2014). These agencies have clear rules enforce as law to protect investor capital and create a model to be followed by companies that open their capital. To place shares on the New York Stock Exchange, for example, an oil company should follow the rules published by the SEC in American Federal Records, which define reserves as

> Quantities of oil and gas which, by analysis of geological, geophysical and engineering data, can be estimated with reasonable certainty to be economically produced from a given date forward with knowledge of the reservoir, and under existing economic conditions, methods operational and government regulation - before the lease contract for operating right expires, unless there is an indication of renovation with reasonable certainty, though deterministic or probabilistic methods are used for the estimate.

Besides all the concerns stated in the SEC's mission, there are real cases when the declaration of the reserves of the oil companies directly affected their performance on the stock exchanges. The Royal Dutch / Shell Group case, on January 9th, 2004, for example, is emblematic. The company formally reclassified proven volumes, i.e., reserves estimated with reasonable certainty to commercial recovery for reserves with little chance of recovery. The result of such news was fear, and the share value fell dramatically (Anacleto 2014). Brazil also reports that the stock exchange adopts International Financial Reporting Standards (IFRS) as a guide for companies who want to open their capital to the market, and this guide does not determine the disclosure of reserves by companies. Thus, investors have no information other than the financial statements of companies. That was what happened, for example, with the OGX Company in Brazil. OGX was created in 2007 with a capital of 1.3 billion US dollars and, in 2008, managed to capture about 6.71 billion reais in the market, with 63.46% of foreign investment, due to the release of a reserves study prepared by DeGolyer & MacNaughton - D&M. According to Anacleto (2014), *"It (the study) indicated that its exploratory blocks in the Campos, Santos, Espírito Santo and Pará-Maranhão basin have a total of 4.8 billion barrels of oil equivalent of risk potential of resources, considering an average of 27% success."*

In 2011, OGX made another announcement updating its portfolio of reserves to 10.8 billion barrels of oil equivalent, ignoring the values declared by D&M. In 2013, the company went bankrupt because of the lack of production assets, which should generate sufficient income to cover the expenses incurred over the years. Tests on the most promising field, Tubarao Azul field, in the Santos basin, showed that the productive life of the field would exhaust in the year 2014. Information about an oil company's reserves should be as clear as possible, despite all the subjectivity involved, to allow better decisions for those who want to enter the financial market (Anacleto, 2014).

Reserves certification in the main oil producer countries and Colombia

Based on BP Statistical Review of World Energy June 2015 (British Petroleum, 2015), the fifteen largest producers of oil in the world were chosen for this research, and also Colombia, which has an open market with reliable and recent regulation. The following sections will list the criteria used for evaluation of reserves and the method used for reserves certification in each of these countries.

Norway – The Norwegian Petroleum Directorate (NPD), similar to a regulatory agency, has a document known as "Guidelines to classification of the petroleum resources on the Norwegian Continental shelf" that defines the rules for reserves classification. Following this guide: *"Reserves comprise marketable oil resources, recoverable and remaining in an oil deposit, already licensed and approved for development or that has an exemption for the demonstration of the development plan."*

Colombia – The National Hydrocarbon Agency of Colombia (ANH), in its resolution 159 of February 12th, 2014, states that the valuation method of reserves set in the country will be the PRMS, drafted by SPE; also ANH is the only requested regulatory agency that reports its resolution about the need for reserves certification. Resolution 159 states that, on December 31 each year, if the proved reserves of an oil company are less than one million barrels of oil equivalent per field, the operator can certify and audit their proved oil reserves by means of an internal auditor. However, for proved oil reserves with a volume exceeding one million barrels of oil equivalent per field, the company is required to audit and certify the reserves by an external specialized company. Despite this determination, the regulation neither defines the criteria for this audit/certification nor the concepts these external auditors should use.

Mexico – The country has a particular regulation for the reserves certification process. Founded in 2008, and formally established in 2009, the National Commission of Hydrocarbons (CNH) has conducted the Round 0. At that time, Pemex, a state-owned company, reported the assets that would be in its custody and the ones that would be returned to the government to promote, in 2015, the Round 1, when exploration blocks would be offered to private companies. According to a specific resolution, the estimation of reserves held by Pemex undergoes a certification, approval and publication process set out by the regulation, as described: the values reported by Pemex are faced with the values obtained by independent reserves certification companies. If these values are differing by up to 10%, the

values are validated; if not, a new certification has to be made.

Brazil – Independent certification companies, which follow regulation determined by the ANP, carry out the process of certification of the concessionaires' reserves. The resolution number 47, of September 3, 2014, establishes the criteria of reserves certification in the country. This resolution is based on the PRMS document prepared by the SPE.

Venezuela – The reserves of the country are estimated by Petroleos de Venezuela S.A., a state-owned company, and become official by the Ministry of the Popular Power of Oil and Mining, following the document Definitions and Rules of Hydrocarbon Reserves. The Hydrocarbon Law of the country does not particularize reserves certification.

United States – The Federal Oil and Gas Royalty Management Act of 1982 puts all oil and gas produced on land or on the outer continental shelf under the direction of the Secretary of the Interior. The Department of the Interior designated the Bureau of Ocean Energy Management (BOEM) as the administrative agency responsible for the development of offshore reserves. The Department of the Interior is obliged, under the Outer Continental Shelf Land Act, to continuously conduct investigations in reserves to determine the amount of oil and gas produced and the availability of offshore reserves. In this respect, the BOEM applies the "Resource Evaluation Program", which leads independent studies in the reservoirs to develop estimates of the economic potential of the reserves. The estimate of reserves is periodically revised to keep the data up to date during the development and production of reservoirs. The BOEM adopts the PRMS as the methodology for evaluation and classification of reserves. The "Resource Evaluation Program" develops independent estimates of the original volume of hydrocarbons in new fields and periodically reviews its estimates to reflect the new discoveries, development, and annual production.

Russia – According to the "Law on Subsoil", the mineral reserves of the country are compulsorily assessed by the state, and no company can explore them without previously being examined by the government. Evaluations are made by organizations linked to the Federal Agency for Subsoil Use, including the State Reserve Commission and the Central Reserve Commission. If the economic potential of the reserves is confirmed by any of these organizations, the reserves will be added to the State Balance of Mineral Products. As soon as a company has the license to explore, develop or produce a reserve, it shall prepare an annual report on the changes in the reserve. This report must be received and approved every year by the Central Reserve Commission. If the changes in it are very significant, the report will be sent to the State Reserve Commission. The system applied to classify the reserves is the Russian Reserves System, which was inherited from the communist government system of the Soviet Union and has its methodology.

Canada – By the rules of the Canada Petroleum Resources Act, the company responsible for discovering a reserve should ask the National Energy Board (NEB) a declaration of "significant discovery" that suggests the existence of a potential hydrocarbon accumulation to be produced or a declaration of "commercial discovery", which shows there is enough oil to justify the investment to produce it. In accordance with the "Joint Guidelines Regarding Applications for Significant or Commercial Discovery Declarations and Amendments", a document of the Canada-Newfoundland Offshore Petroleum Board, which is part of the NEB, the company must provide a report about the reserve with reliable information, hypotheses and theories based on the Canadian law for reserve classification in order to apply some of these statements, The information should be scientifically valid without speculation. Based on these data and discussions with the interested company, the Board will decide whether the validation of the statement of discovery will be granted or not. The Canadian legislation uses the National Instrument 51-101 Standards of Disclosure for Oil and Gas Activities, based on the COGE Handbook Definitions, for the classification and valuation of oil reserves. The PRMS was a guide for the COGE's evaluation and categorization of reserves aspects.

China – As specified by the document "Notice on Adjusting the Administration Authority of the Confirmation (recording) of Price Value, Appraisal and Recording of Mineral right (No. 166 [2006])", the Ministry of Land and Resources is the one responsible for the evaluation and registration of mineral reserves. Companies must submit their reserves for certification by the government, which has its methodology. When an agency performs the assessment of reserves and presents it to be evaluated by the government, it must give a technical report about the reserves, accompanied by other documents, including a written declaration that all the information is accurate. Also, according to the "Regulations on Administration of Geological Data", everyone who has a license to explore a particular area must necessarily send geological data for the qualified geology and mineral reserves department of the region. These data should be following the standards established by the department responsible for it and the technical standards of the state. The China Petroleum Reserves Office implements the methodology for classifying reserves although public data about this system is hard to find.

United Arab Emirates, Iran, Iraq, Kuwait, Nigeria and Qatar – None of these countries has any specific public regulations on reserves evaluation and certification. In addition to difficulties in communication in terms of language, it seems these countries have no interest in making public their strategic reserves information, as sometimes it is politically manipulated focusing on benefits, as already told.

Conclusion

Besides the complexity of the process, evaluation and proper certification of oil reserves are fundamental in all aspects of society. As previously seen, there is a methodology developed by SPE, the PRMS, which categorizes and classifies the reserves; it has been used by some countries in the world, but there are no domestic and international regulations to determine how to certify oil reserves. Some countries such as the United States, Canada, and Brazil have the PRMS methodology as a guide for categorization and evaluation of their reserves. The literature research conducted about the major oil producing countries, both in technical sphere and in government, economic/business, and politics pointed to decentralization and lack of uniformity

in the existing concepts. This lack of uniformity leads to cases such as OGX and Shell, which an error in the technical evaluation placed a large number of shareholders at a disadvantage. For the certification of reserves, it is known that the absence of a specific methodology may affect the amounts reported by the producing countries. Governments can manipulate these numbers, either more or less, in order to take advantage of the commodity market fluctuations. Some countries do not have interest to make public the numbers of their volume of reserves or the way this calculation is made. That is due to the international importance of these data for the strategic positioning of the country in the world. A higher or lower amount of reserves can give the country visibility and global power only equivalent to the great powers. Only two countries listed in this article, Colombia and Mexico, cite in their regulations the "Independent Certifier" agent of reservations. This agent would be a company that attests the values of the reserves of the producing companies. After analyzing all the data previously examined, and according to the information obtained, it is recommended, for future work, to develop a single methodology for reserves certification that can be used in all spheres of society, in which oil industries, financial markets, and governments can practice those values. Governments (ministries and agencies) and all agents working in the oil industry (companies, governments, and stock exchanges) could implement this methodology, attesting, this way, the form and the values of the oil reserves.

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