ACCOUNTING CHOICES AND THEIR DETERMINANTS IN OIL AND GAS ACTIVITIES OF GLOBAL MAJOR COMPANIES

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ABSTRACT

One of the two objectives of this study was to determine whether there is significant variation in accounting treatment choice of oil and gas activities of major oil and gas companies, and the second objective was to identify critical factors for accounting choice. To achieve the objectives, the study collected data from 25 major oil and gas companies using a checklist of items (index) which was used to review accounting policies covered by the financial statements of these companies. The data collected was analysed using both descriptive and inferential statistics whereby non-parametric tests were used. The study findings show that in case of accounting treatment choices, there are significant variations in accounting treatment on oil and gas activities. In case of determinants, the study found that company size has influence on initial measuring decommissioning liability, using proved reserves as basis for unit of production, using fair value as well as recognition of both cash payments and value of future assets in case of unproven reserves. Company location was found to have influence on use of LIFO to value inventories, not recognising deferred taxes at initial recognition of decommissioning liability, use of proved reserves as a basis for unit of production, recognition cash payments received only in case of unproven reserves, as well as application of successful efforts method. Duration was found to influence the use of reducing balance method to depreciate its assets as well as not recognising deferred taxes at initial recognition of decommissioning liability. The study suggests that accounting standard setters have to strike a balance between harmonisation and accounting flexibility, to ensure that accounting data is both comparable and informative.
Key words: *full cost method, successful efforts method, accounting choices, oil and gas accounting, non-parametric tests*

INTRODUCTION

The purpose of this study was twofold: one, to determine whether heterogeneity of accounting treatment choice of oil and gas activities is revealed by financial reporting of major oil and gas companies, and two, to identify the determinants of accounting choices adopted by major global oil and gas companies. The study used a broad definition of accounting method choice to imply the act of management of oil and gas companies to select and apply competing accounting methods (Helfin *et al.*, 2002; Misund, 2017). This act of selecting and applying accounting methods, while it is supposed to be done in accordance with acceptable accounting principles, there is flexibility which provides management with discretion on which accounting methods to use and in some situations may provide room for accounting manipulation (Misund, 2017). The study therefore, was motivated by the

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argument that the presence of accounting flexibility helps accounting data to be more informative for understanding the economic situation of a company than accounting rigidity (Palepu *et al.*, 2000). In the same way, not all companies have the same level of accounting flexibility because some have their choices more constrained while others are less constrained (Palepu, *et al*., 2000). The extant literature provides that companies operating in the oil and gas industry have greater accounting flexibility than those operating in other industries (Adere, 2011; Misund, 2017). It is therefore expected that addressing these two purposes will enhance the understanding of accounting treatment choice and associated critical success factors in the major global oil and gas companies.

The importance of this study is based on the following reasons. First and most important is the uniqueness of the oil and gas industry as far as accounting is concerned (Evans, 2013). The uniqueness arises due to the acceptability of two accounting methods which are fundamentally different or competing, namely, Full Cost (FC) and Successful Efforts (SE) methods (Adere, 2011; Evans, 2013; Jennings *et al*., 2000; Malmquist, 1990; Misund, 2017). The main difference between these two accounting methods lies on whether exploration (pre-production) costs should be capitalised or expensed. While for FC, all exploratory costs are capitalised, for the SE exploratory costs to be capitalised are only those directly related to revenue producing wells (Malmquist, 1990). Second, it is political pressure caused by greater government involvement on the accounting issues of oil and gas companies (Wolk *et al.*, 2004). Government involvement is usually brought by criticism from citizens who think that oil and gas companies are making huge profits and therefore are susceptible to corruptible behaviour. Third, the presence of competing and greater government involvement has created a situation where there is lack of clear global accounting standards for oil and gas activities (Adere, 2011). Lack of clear accounting standards has also created an opportunity for lobbying groups and those with self-interest to capture the process of standard making and regulating the oil and gas activities (Bowrey *et al*., 2007; Cortese *et al.*, 2010; Deakin, 1989; Laffont & Tirole, 1991; Misund, 2017; Soobaroyen, 2011; Wolk *et al*., 2004).

Furthermore, the presence of competing accounting methods and capturing of accounting standards making process has reduced the comparability of financial statements produced by oil and gas companies. It has been argued by Misund (2017) as well as DeFond and Hung (2003) that the presence of accounting heterogeneity can reduce comparability and relevance of accounting information. The concern for the negative effect of accounting flexibility based on heterogeneity has been noted not only by academics but also by practitioners. Different works by practitioners have found that there exists a difference in accounting treatment of different oil and gas activities across the globe (Ernst & Young, 2009; KPMG, 2008, 2011; PWC, 2011). As such, if accounting heterogeneity exists, one would expect different choices among oil and gas companies to be identified. More than that, users are expected to understand reasons (i.e. factors) for the different choices among such companies.

While available literature has attempted to address issues relating with the two expectations as identified in the preceding paragraph, this study is an extension of this literature by assessing the magnitude of variations and their determinants. It is an extension for both academic and practical works. For example, academic works have focused on market efficiency and efficient contracting using the Positive Accounting Theory (PAT) and Agency Theory (AT) (see Collins *et al.*, 1981; Helfin *et al.*, 2002; Holthausen, 1990; Lilien & Pastena, 1982; Malmquist, 1990). In these studies, accounting treatment choices are considered to be driven by the interest of managers to maximise their benefits, that is

opportunistic behaviour. These studies have ignored the influence of organisational variables as well as availability of competing accounting methods as source for variations. Also, for the studies which examined organisational factors, namely, size, location and duration, this complements such studies because first they have mixed results and second they have not utilised Nobes's classification of accounting for each country as well as life cycle of the company. On the other hand, studies conducted by practitioners, apart from being based on perception of the respondents, focused on availability of different accounting methods as source of variation in accounting treatment of oil and gas activities. In addition, studies conducted by practitioners identified accounting methods according to the accounting standards; hence, they did not test the existence of variations in financial reporting of oil and gas activities.

For this study, data was collected from financial statements of 25 major oil and gas companies for the financial year ending 2013. To capture the accounting treatment, the study used a checklist index comprising items for each main type of activity for oil and gas. The analysis of data involved both descriptive and inferential statistics which adopted non-parametric tests. In case of the variation (heterogeneity), using chi-square, the study found that out of 84 items, 68 were found to be significant while the remaining few did not have significant variation. On the issue of determinants using Mann-Whitney U test, the study found that size had strong significant influence on only one item which is the company initially measuring decommissioning liabilities and related capitalised assets at the best estimate of the cost required to settle decommissioning liability or to transfer it to a third party. Size was found to have weak influence on three items; these are using proved developed reserves as a basis for units of production, using fair value to measure non-controlling interest as well as recognition of both cash payments received and value of future assets to be received. For company location, the study found that it has got strong influence on two items: use of LIFO to value inventories and not recognising deferred taxes at initial recognition of decommissioning liability. It also had a weak influence on three items: application of successful efforts method, use of proved developed reserves as a basis for unit of production and recognition of received cash payments only in respect of the work performed. Using Kruskal-Wallis test to test the influence of duration, the study found that duration had significant influence on two items: the use of reducing balance method to depreciate assets and not recognising deferred taxes at initial recognition of decommissioning liability. From the results of this study, the indication is that because of the existence of heterogeneity on accounting treatment of oil and gas activities, the argument that the accounting data may be more informative but may compromise comparability is supported.

This article is organised in five sections. After this introduction, the second section presents literature and development of hypotheses for this study. The third section presents the research design which describes the research approach applied, data collection techniques, data set used as well as data analysis techniques. The fourth section presents empirical results of the study whereby descriptive analysis and inferential analysis are presented, while the fifth section provides the discussion and conclusion of this study. In this section, the results are discussed in relation to the theoretical perspective and prior literature, and a conclusion is drawn from the findings.

LITERATURE REVIEW AND HYPOTHESES

Choice of accounting treatment in oil and gas

Accounting principles provide some flexibility in accounting treatment of various business transactions (Mulford & Comiskey, 2002). According to Mulford and Comiskey, flexibility of choice of accounting treatment in some circumstances creates room for judgement hence enabling companies to get involved in financial games (i.e. creative accounting techniques). To understand the accounting variation of accounting choices, several theories have been used. For example, Collins *et al.* (1981) consider that accounting choices can be explained in two theories. The first of these theories is the Positive Accounting Theory (PAT) developed by Watts and Zimmerman in 1978 which assumes that human behaviour can be explained by individual wealth maximisation behaviour, implying that on actor will influence the choice of accounting treatment to the extent that choice will influence wealth. According to PAT, flexibility in accounting principles creates the possibility for opportunistic behaviour because managers are self-interested, risk-adverse and effort-adverse; hence, they will choose the accounting treatment that will boost their own interests (Barth *et al.*, 2008). However, other studies using the same theory found that managers use the flexibility provided by accounting to improve governance through efficient contracting, i.e. agency cost (see for example Fields *et al.*, 2001). This is consistent with studies using the AT which consider that the selection of accounting choices is based on managers' contractual motivations. However, this does not mean that all managers will select the same accounting choices. Different contractual mechanisms and opportunities will create variations in accounting choices. According to Heflin *et al.* (2002), managers with high reputation for stewardship over company's assets will have limited response to contractual motivation to certain accounting accruals compared to those with less reputation. Likewise, Fields *et al.* (2001) argue that managers who are considered to have consistent goals with shareholders may choose accounting treatment to convey private information to the investors whereas other managers may use accounting choices opportunistically to boost their rewards. These contrasting arguments show that different accounting treatments can be used for similar economic events even in the same industry. Another theory is Institutional Theory (IT) which indicates external pressure, imitation by modelling successful organisations and collective struggle from members of a professional group. Based on IT, a company operating in a market with perfect conditions may have less accounting flexibility because of the coerciveness (in terms of regulatory environment) of the market. According to Fields *et al.* it is only when certain conditions are violated that accounting flexibility exists.

However, this study has not been concerned with creative accounting techniques, but with variations in accounting choices based on flexibility provided by accounting principles. As put by Bath *et al.* (2008), that flexibility in accounting principle has created a concern for securities regulators because it decreases the accounting quality. This is consistent with the argument that flexibility in accounting principles may make even companies in similar industries report dissimilar results, hence reduce comparability (De Franco *et al.*, 2011). But there are advantages associated with accounting flexibility which include helping accounting to keep pace with business innovations as well as making accounting data more informative for understanding company's economics (see Levitt, 1998; Palepu *et al.*, 2000). Likewise, Mulford and Comiskey (2002) consider that the existence of flexibility is because financial transactions for companies are not sufficiently similar to warrant use of identical accounting treatments even for companies within the same industry. To Fields *et al.* (2001) accounting flexibility has created an optional solution to the agency problem because it mitigates managers' attempt to obtain accounting results by means of real decisions. It is due to this

perspective that Bøhren *et al.* (2004) opine that exploring accounting standards compliance is irrelevant or trivial because the flexibility provided makes the standard non-binding. The views provided by Bøhren *et al.* may be consistent with those of Fields *et al.* (2001) who argue that despite various studies on accounting choice, there is still a knowledge gap regarding the purpose of accounting choices.

Fields *et al.* conducted a study to generate an understanding on accounting choices by reviewing and summarising results of research on accounting choice and concluded their results of empirical review by indicating that there is limited progress on academic choices of accounting treatment. The aspect of accounting treatment variation has not been given adequate attention by prior literature particularly on comparing one/several treatments over others. This may be caused partly by the reasons identified by Fields *et al.* which include failing to take into consideration multiple goals on accounting choice, ignoring the major rule of accounting as well as lack of clear definition of accounting choice. Most of empirical literature has been concerned with determinants of accounting choices on the one hand and the consequences of a particular accounting choice on the other (see for example Bradshaw *et al.*, 2009). Bøhren *et al.* (2004) found that accounting norms influence choice of accounting treatment whereby the equity method was found to be used more by manufacturing companies than other companies. The results by Bøhren *et al.* (2004) are not consistent with the argument by Mulford and Comiskey (2002) which expect variation within similar industry. Likewise, examining the accounting treatment of depreciation and inventory method for the companies that do not have long-term debt in their capital structure, Gopalakrishnan (1994) found that there is a difference in accounting treatment of depreciation and inventory of unlevered companies.

The limited empirical studies on the magnitude of variation of accounting treatment are also seen in the oil and gas industry which has been facing a lot of accounting dilemma (Jennings *et al.*, 2000; Larcker & Revsine, 1983). This situation exists despite a number of variations identified by studies conducted by practitioners (see PWC, 2011; KPMG, 2008, 2011). Studies conducted by practitioners have observed a number of variations in accounting choices which are consistent with the views provided by Mulford and Comiskey (2004), that accounting flexibility can create differences in accounting choices even with similar companies. According to PWC (2011), flexibility offered by accounting principles (particularly through IFRS 6) which gives companies freedom to choose their accounting treatment and disclose it, is a cause for the IFRS 6 variation. The KPMG (2008) survey provides relevant information about accounting choices; however, it lacks scientific rigour and it is based on compliance with IFRS which means other accounting choices developed by other accounting regimes such as US GAAP are ignored. Another study by practitioners is that by PWC (2011) which identified variation of choices of accounting treatment based on three oil and gas activities which are upstream, midstream and downstream. The study indicates that variation of accounting treatment on tangible, intangible exploration and evaluation assets is based on the development decision taken. The usefulness of the studies conducted by KPMG (2008) and PWC (2011) is that they help to identify major areas of focus for assessing the accounting treatment. Although these studies have tried to identify the variation in accounting choices, the magnitude of similarities and differences is not known.

To address the limitation of the studies conducted by practitioners, this study argues that accounting flexibility can create room for different accounting treatment choices in some areas as well as similarities in others. This argument is based on three theories - AT, PAT and

IT. Under the AT, this study considers that oil and gas companies have different accounting choices because managers have different contractual motivation hence different responses. In case of PAT, this study considers that managers have different opportunities to maximise their wealth, consequently even their accounting choices are expected to be different. However, using IT, according to Collin *et al*. (2009), there is institutional pressure which will force companies to choose similar accounting treatment. This pressure could be coercive, mimetic or normative. However, because the major global oil and gas companies are operating in different environmental settings then it is considered that these companies will be responding to different institutional pressures. Therefore, based on these theoretical assumptions, it is expected that variation in accounting treatment choices would be exhibited by oil and gas companies. Based on empirical literature and theoretical foundation, this study put forward the following testable hypothesis.

H_1: Oil and gas companies apply different choices of accounting treatment for their activities.

Determinants of accounting treatment
Empirical studies on determinants of accounting choices have used different theoretical perspectives. For example Fields *et al*. (2001) used economics of the firm based on Modigliani and Miller (MM) and classified accounting choices into three aspects: contracting, asset pricing and external parties. Contracting is associated with market imperfections due to presence of agency costs required to solve agency problems. The choice of accounting treatment here is concerned with the influence on one or more companies in the contractual arrangements. According to Fields *et al.* (2001), contractual arrangements are there to mitigate agency conflicts between internal users and external users. In this aspect, accounting treatment choice has a purpose to influence the output of the accounting system in a particular way. These views are consistent with those provided by Aho (2006) that accounting is not only a revelation of financial results of the organisation but it is also responsible for making those organisations. Asset pricing, according to Fields *et al*. (2001), is concerned with information asymmetries in the process of influencing the asset prices. In this aspect, accounting choices are used as mechanisms to ensure that informed individuals provide information to those who do not have information. This aspect of accounting choice is more concerned with market efficiency because information is provided about risks and future cash flows to those outside the organisation to ensure that they make well-informed decisions. However, this perspective ignores the irrationality and self-interest of managers or those who are making choices of accounting treatment. As argued by Levitt (1998), in a market where financial analysts are efficient, managers make choices to meet analysts' forecasts to maintain share prices. For external parties, this is concerned with third parties who may include tax authorities, government regulators, suppliers, trade unions etc. (Fields *et al*., 2006). On this point, managers' choice of accounting treatment is influenced by third parties' reaction to accounting numbers produced by the companies. These three classifications of accounting choices are also consistent with institutional pressure as per IT as argued by Carpenter and Feroz (2001) - that IT can help to explain accounting choice in organisations where managers who want to maximise their interests cannot exert influence.

The classification categories of determinants by Fields *et al*. (2001) go beyond the opportunistic behaviour as identified by Mulford and Comiskey (2002). According to opportunistic behaviour perspective, managers are self-interested people who will choose the accounting treatment which will boost their rewards. Healy (1985) found that managers

choose accounting treatments to maximise bonus if rewards are based on a pre-specified level of earnings. Likewise, Lewellen *et al.* (1987) found that managers approaching retirement age are less likely to undertake research and development expenditure if rewards are based on accounting-based measures. While findings by Lewellen *et al.* are based on opportunistic behaviour, they are rather consistent with the argument provided by Fields *et al.* (2001) on definition of accounting choice. According to Fields *et al.* (2001) the broad definition of accounting choice includes real decisions made by managers for the purpose of affecting accounting numbers such as increasing production to reduce cost of goods sold by reducing fixed cost per unit as well as reducing research and development expenditure to increase earnings.

However, in the case of oil and gas industry, the study by Malmquist (1990) had findings which are not consistent with the Opportunistic Behaviour Hypothesis (OBH) and supported the Efficient Contracting Hypothesis (ECH). According to the findings by Malmquist (1990), the choice between FC and SE is based on the need to efficiently manage the contracts among the economic agents. Malmquist's (1990) study focused on economic factors while ignoring political factors and AT factors. As such, the influence of lobbying groups in accounting standards by global companies and managers as identified by Cortese *et al.* (2008), Deakin (1989) as well as Spear and Leis (1997) is ignored. For example, while investigating the association between management lobbying and accounting for oil and gas activities and their effect on cash flow, Deakin (1989) found that oil and gas companies were involved into a series of events to influence formulation of accounting standards. Not only did Deakin's (1989) study support the efficient contractual arrangements perspective, but also it provided a link to management attitude towards the choice of accounting treatment. If the managers lobby for a certain accounting choice, they want either to maximise their rewards if such rewards are accounting-based or to influence the external parties (see Fields, *et al*., 2001). This indicates an opportunistic behaviour which was also revealed by a study conducted by Larcker and Revsine (1983) which found out that factors influencing application based on market reaction were consistent with incentive effect.

While available literature has been extensive on factors influencing accounting choice, the majority of these studies have focused on market (i.e. using market efficiency perspective), managers' interest and regulators (i.e. external pressure). Limited studies have utilised organisational theories particularly the Contingency Theory to understand other factors influencing selection of a particular accounting choice in the oil and gas sector. The theory considers both internal and external organisational factors influencing accounting choice. These limited studies have identified factors which include the size of the company, the level of capital intensity as well as competition that companies face (Hagerman & Zmijewski, 1979; Malmquist 1990). Malmquist (1990), for example, found that in the oil and gas industry, large companies choose the SE while smaller companies choose the FC method.

The influence of organisational factors has also been identified by studies conducted by practitioners. For example KPMG (2011), using responses from various respondents identified factors such as preparation requirements, audit costs, resource availability as well as regulatory requirements. Likewise, the study conducted by PWC (2011) identified factors such as company's intention to recommence drilling or development operations, business characteristics (such as joint ventures and variety of different taxes and duties) as well as political and accounting effects. According to PWC (2011), political pressure has created room for nationally accepted accounting principles, for example, while IASB framework

allows the use of proved reserves or proved and probable reserves, some national GAAP have required the use of only proved developed reserves.

It can be argued in this study that while empirical literature tends to agree that there are a number of factors influencing the choice of accounting treatment in the oil and gas industry, the results are not consistent. Likewise, the variables used are not the same in all studies. In this study, it is argued that choice of accounting treatment in oil and gas will be influenced by the organisational variables, namely, size, location and duration of the company. These variables are discussed in the following sections.

Size of the company
Organisational literature based on the Contingency Theory considers that size of the company may affect the way the company is designed and use of the information system (Hoque & James, 2000). The design of the company includes selection of the accounting treatment of company's activities; as such, it is considered that company size will affect the choice of accounting treatment. This is supported by studies grounded on PAT which consider size to be related with political visibility and political costs (Holthausen, 1990; Watts & Zimmerman, 1978). According to Holthausen (1990) who reviewed about eight studies which examined the relationship between company size and accounting treatment choice, he found out that five of them showed significant relationship. Lilien and Pastena (1981) examined the relationship between size and choice of accounting treatment in the oil and gas industry and found there was positive relationship. Another empirical example is the study that was conducted by Bowen *et al.* (1981) which found that large companies in the oil and gas sector avoided using accounting methods that enhanced capitalisation of interest. Bowen *et al.* (1981) based their argument on views suggested by Watts and Zimmerman (1978) that firms which are vulnerable to political pressure will choose accounting methods that reduce their reported income and this is more likely to happen to large companies. Likewise, the study conducted by Hagerman and Zmijewski (1979) found a significant relationship between firm size and choice of accounting treatment. A study conducted by Waweru *et al.* (2011) also indicated that company size is positively related to the choice of accounting treatment which is concerned with income strategy. The results of the study conducted by Waweru *et al.* (2011) are not consistent with political cost perspective because large companies are not selecting accounting methods that will decrease the level of profit. Based on these theoretical and empirical studies, this study suggested the following testable hypothesis:

H_2: *The choice of accounting treatment for oil and gas activities is significantly influenced by the size of the company.*

Location of the company
In the case of location, studies on accounting standards have argued that companies operating in similar circumstances or environment tend to use similar accounting methods (Jaafar & McLeay, 2007; Nobes, 2008, 2011). According to Jaafar and McLeay (2007), country effects are considered to have greater consequence on the selection of accounting choices because of different accounting rules and jurisdictions. A number of empirical studies have been conducted using country (for location of the company) as determinant of accounting choice (Cole *et al.*, 2011; Jaafar & McLeay, 2007; Souza & Lemes, 2016). The significance of location in terms of country has been explained by Doupnik and Taylor (1985) as being based on geographical location of each country hence causing differences in compliance. Also, Tay and Parker (1990) consider that the difference in accounting choice based on location in

terms of country is brought by regulations and practices (de-jure vs de-facto). In case of regulations, these are concerned with accounting methods to be followed as provided by laws or accounting standards developed by relevant boards. On the other hand, practices are accounting methods which are actually applied by companies. In this aspect, it is considered that although countries may have similar accounting standards, when it comes to actual implementation, the results may not be the same. However, the major limitation of empirical studies on location is classifying the countries of origin. Nobes (2008, 2011) came up with two classes of countries as far as accounting is concerned: Class A and Class B. Class A comprised of those countries with strong equity and commercially driven standards. Class B comprised of a weak equity, government driven and tax dominated environment. Based on such classification, Nobes (2011) noted that there were differences in application of accounting treatment choices between Anglo and Continental Europe. Hence, the following hypothesis was tested:

H_3: The choice of accounting treatment for oil and gas activities is significantly influenced by the location of the company.

Duration of the company

Duration of the company is concerned with the age of such company, which is an indication of company growth or maturity after passing through different phases of its life cycle. Dickinson (2011) argues that a company's life cycle is a distinct phase which is determined by both internal and external factors hence having choices of accounting treatment that reflect these phases that would provide useful information to investors and creditors. According to Dickinson (2011), capturing organisational growth is difficult because the company is an aggregation of multiple products each with its own life cycle stages, as well as competing in multiple industries. Dickinson, considering economic literature, provides a five-stage firm life cycle classification; the stages include introduction, growth, mature, shake-out, and decline. On the other hand, based on psychology, the Greiner Model provides six phases of company growth which are growth through creativity, growth through direction, growth through delegation, growth through coordination, growth through collaboration and growth through alliances (Mulder, 2013). These two approaches of company life cycle indicate the difficulties involved in understanding stages of organisational growth. However, in this study, the objective was to examine the relationship between choices of accounting treatment and company growth under the perspective that as a company grows there is a possibility of changing accounting treatment. This is consistent with the argument by Greiner (1998) that the same company's practices are not maintained throughout the life span of the company. While growth stages of the organisations may have impact on selection of a particular accounting choice, limited empirical studies have been conducted on the subject matter (Deakin, 1979; Lilien & Pastena, 1982; Dichev & Li, 2013). These studies present mixed findings for example while Deakin (1979) and Dichev and Li (2013) found that there is no relation between accounting choice and duration in terms of company growth. Lilien and Pastena (1982) found that growth in terms of age was positively related with accounting choice. As such, in this study, it is considered that duration of the company will have influence on accounting treatment choice and the following hypothesis was postulated:

H_4: The choice of accounting treatment for oil and gas activities is significantly influenced by duration of the company.

STUDY METHODS

Measurement of variables

To measure the variation, this study analysed significant accounting policies disclosed by oil and gas companies in their financial statements. To capture the accounting policies of oil and gas companies, a checklist of items (an index) was compiled. The index included items which are unique to the oil and gas industry as well as those which are general to all industries. The items were assessed for the major seven activities of oil and gas companies. The first activity involved exploration and evaluation (E&E) with 14 items in the index. The second major activity identified was depletion, depreciation and organisation (DD&A) with 11 items in the index. The third major activity was revenue recognition with 15 items in the index. Inventory valuation formed the fourth major activity with 12 items in the index. The fifth major activity was decommissioning and environmental provisions with 10 items in the index. The sixth major activity was business combinations and joint arrangements with 13 items in the index, while the last major activity was farm-ins and farm-outs with 9 items in the index. These items represented identified accounting choices available for each activity under the respective category; for example, in E&E the available methods were full cost (FC), successful efforts (SE) and reserve recognition accounting (RRA). The identified items were assigned values from 1 to 3. Score 1 represented "Yes", meaning that the treatment was used, while 2, represented "No", meaning that the treatment was not used. Score 3 indicated non-applicability of the accounting choice.

In case of the determinants of the choice of accounting treatment, this study used three independent variables: company size, company location and company duration. The first variable (size) was captured by three items, i.e. revenues, amount of capital invested as well as size of reserves. In this case, the companies were classified into two groups: large and small. The second factor was location by the company, based on international accounting classification as identified by Nobes (2008, 2011). According to Nobes, in a detailed two-group classification of accounting, countries are divided into two groups: Class A, characterised by strong equity with commercial-driven approach, and Class B characterised by weak equity and government driven approach. These were further classified into two categories. Companies whose headquarters were in commercially-driven countries were marked as Category 1, while those companies whose headquarters were in government-driven countries were marked as Category 2. The main argument here was that companies from one Class (say A) might exhibit more similarities in accounting treatment than those coming from another class.

The last independent variable was duration, whereby the companies were classified into six categories based on the year of establishment. These categories were developed based on Greiner's Curve of Organisational Growth (or organisational life cycle) as developed by Larry Greiner in 1998 (Mulder, 2013). Category 1 represented those companies with less than 10 years of operation, and this was considered a creativity phase. Category 2 represented companies that had been in operation for between 10 and 30 years, and was considered a direction phase. Category 3 represented companies that had been in operation for between 30 and 60 years, which was considered as decentralisation phase. Category 4 comprised companies having between 60 and 90 years, which was considered the coordination phase. Category 5 comprised those having between 90 and 120 years of operation, and this was considered a collaboration phase. The last category 6 comprised those companies with more than 120 years of operation and this was considered an alliance phase (see Table 1).

Table 1: Duration category based on Greiner's Growth Model

Categorisation as per Greiner Curve		Categorisation as per this study	
Greiner phase	**Features**	**Years covered**	**Category**
1. Growth through creativity (crisis of leadership)	• Focus on the creation of new products and services	Less than 10 years	Category 1
2. Growth through direction (crisis of autonomy)	• Organised structure • Formalised budgeting and accounting • More autonomy to lower level managers	Between 10 to 30 years	Category 2
3. Growth through delegation (crisis of control)	• Incentives linked to stock and profits are provided • Loyalty encouraged • Top executive feel loss of power or control	Between 30 and 60 years	Category 3
4. Growth through co-ordination (crisis of red tape)	• Flexible communication networks • Increased bureaucracy	Between 60 and 90 years	Category 4
5. Growth through collaboration (crisis of identity)	• Managed by more flexible systems • Shift to problem solving approach • Incentives provided to teamwork and education	Between 90 and 120 years	Category 5
6. Growth through alliances	• Creation of extra-organisational alliances • Mergers and networked collaborations • Possibility of subsuming or being subsumed by other companies	Above 120 years	Category 6

Sample Data
The sample data used in this study comes from 25 oil and gas companies around the world, as obtained from these companies' websites. The selection of oil and gas companies was based on a list provided by various groups such as Fortune Global 500 and search engines such as Google. For the company to be included in the sample it had to have financial statements which were downloadable. From the financial statements, the review of accounting policies of each company to derive data for the choice of accounting treatment and for independent variables was done. This was accomplished through a checklist index which was developed using accounting standards (specifically IFRS), studies conducted by practitioners and their guidance (Ernst & Young, 2009; KPMG, 2008, 2011; PWC, 2011). Based on these documents, the checklist index was divided into two sections: profile and demographic details of the company, and accounting treatment choices put as items. The accounting treatment items were divided into seven categories that included E&E, DD&A, decommissioning and environmental provision, business combinations and joint arrangements, farm-in and farm-outs, revenue recognition as well as inventory management. The data collected was prepared for data analysis to avoid errors and unusual presentation, to eliminate bias as well as exclude outliers (Harris & Ohlson, 1987).

Data analysis
For the analysis, this study utilised both descriptive and inferential analysis. As far as descriptive analysis was concerned, data was used to present details which included location of the company, its main operations and number of years in operation. Descriptive statistics were used to describe the entire set of variables (independent and dependent) of the study. These variables were presented descriptively using frequency and percentage. The independent variables in this study included location, size and duration of the company. On the other hand, dependent variables were the accounting choices which were divided into seven categories: exploration and evaluation (E&E) assets, depletion, depreciation and amortisation (DD&A), decommissioning and environmental provisions, business combinations and joint arrangements, farm-ins and farm-outs, revenue recognition as well as inventory management (valuation). In each of the categories, there were a number of items reflecting the corresponding available accounting choices.

In case of inferential statistics, this study used three non-parametric techniques or distribution-free tests (Field, 2009; Ho, 2006), namely, chi-square, Mann-Whitney U test and Kruskal-Wallis test. There are two main reasons for the application of non-parametric tests in this study. First, the data collected used nominal and ordinal measurements, i.e. non-metric variables as argued by Smith (2003) - that nominal and ordinal measurements are appropriately tested using non-parametric tests (Ho, 2006; Sheskin, 2003). Second, the sample size of 25 companies was considered small (i.e. n<50) to achieve characteristics of normal distribution as well independence of observation (Kalaian, 2008; Siegel, 1956). This is consistent with the argument provided by Foster (2006) that non-parametric tests can be used for skewed data because they are not influenced by outliers and are less sensitive compared to parametric equivalents. As such, in this study, before performing non-parametric tests, tests for normality and homogeneity of variances were conducted. In the case of normality, this study used the Kolmogorov-Smimov test and Shapiro-Wilk statistic. The p-values for all items under the two test statistics were below 5% significance level, indicating that the data was significantly non-normal. For homogeneity of variance, Levene's test was used (as suggested by Field, 2009) and the majority of items had p-values greater than 0.05 indicating heterogeneity of variance hence violating the assumption of homogeneity of

variances. These test statistics provided further justification for the use of non-parametric tests.

The first hypothesis which is concerned with variation (heterogeneity) of accounting treatment choices was tested using one sample chi-square. According to Foster (2006), it is crucial to differentiate between two sample chi-square and one sample chi-square. While two-sample chi-square is appropriate in testing the relationship between two variables, one sample chi-square is used if there is a single variable and the aim is to test whether observed frequencies differ from what would be expected. As such, in this study, one sample-chi-square was used because the aim was to test whether the frequency of choices of accounting treatment significantly differ from what would be expected (see Israel, 2008). The second and third hypotheses were tested using techniques Mann-Whitney U test while for the fourth hypothesis was tested using Kruskal-Wallis test. Mann-Whitney U test was used for two independent variables (grouping variables) - size and location. Mann-Whitney U test was used to test whether there are significant differences in terms of accounting treatment between large and small companies as well as between commercially-driven (Class A) countries on the one hand and government-driven (Class B) countries on the other. Kruskal-Wallis test was used to test relationship between company duration (in terms of years of operation) and accounting treatment choices. The Kruskal-Wallis test was considered appropriate because there were more than two independent groups.

STUDY RESULTS

Profile of companies

The results of the profile of the company are presented in Table 2. In Table 2, the results reveal that in case of location, the majority of companies covered in the study come from commercially-driven countries (about 64%) and those from government-driven were only represented by 36%. The second profile variable is the size of the company whereby the results according to Table 2 indicate an even division with large companies forming 52% and small companies forming 48%. The company size was based on amount of revenue, whereby the companies with revenue above $60,000 million were considered large and those with revenue less than $60,000 million were considered small. The last variable concerned with the profile of the company was duration, expressed in terms of number of years since its establishment to year 2013. In terms of duration, the results show that the majority of companies had been in operation for between 10 and 60 years (about 60%) while only one company (4%) was found to have less than 10 years in operation. In other words, using Greiner Organisational Growth phases, the majority of companies covered in the sample are in the direction phase and delegation phase. This implies that most companies covered in this study have an organised structure, formalised budgeting and accounting and give more power to the lower managers. In addition, these companies provide incentives in terms of bonus and encourage loyalty, but top managers feel they are losing control or power. In case of types of activities, the majority of companies are involved in all three types - upstream (92%), midstream (80%) and downstream (96%).

Table 2: Profile of companies

	Accounting choice		F (n=25)	%
1	Location of company headquarters	Commercially-driven (Class A)	16	64.0
		Government-driven (Class B)	9	36.0
2	Company size (Classification)	Large (with revenue more than $60 billion)	13	52.0
		Small (with revenue between $5 billion and	12	48.0

		$60 billion)		
3	Number of years in operation (Duration)	Less than 10 years (Creativity phase)	1	4.0
		Between 10 and 30 years (Direction phase)	6	24.0
		Between 30 and 60 years (Delegation phase)	9	36.0
		Between 60 and 90 years (Co-ordination phase)	3	12.0
		Between 90 and 120 years (Collaboration phase)	4	16.0
		More than 120 years (Alliance phase)	2	8.0
4	Types of activities	Downstream	23	92.0
		Midstream	20	80.0
		Upstream	24	96.0

Descriptive statistics on accounting treatment choices

In case of descriptive statistics of accounting treatment choices, the results are presented in Table 3 and Table 4. Table 3 presents results for items with highest score on each main activity of oil and gas activities. In case of Exploratory and Evaluation (E&E) there were 14 items with the item with the highest score as the company write-offs post balance sheet dry holes costs (n = 23, 92%). For Depletion, Depreciation and Amortisation (DD&A) with 11 items, the item with the highest score was the company allocates the cost of an item of PPE into components and depreciate each of them separately (n = 25, 100%). In case of decommissioning and environmental provisions, with 10 items, the highest was recognition of provision for the dismantlement of wellheads when the obligation is incurred (n = 24, 96%). Business combinations and joint arrangements, which had 13 items, the highest was recognition of share of jointly controlled assets, liabilities, expense and income (n = 23, 92%). In case of farm-ins and farm-outs, which had nine items, the highest score was recognition of gain or loss on farm-ins and farm-outs in the E&E phase (n = 11, 44%). For revenue recognition activity of oil and gas, this had 15 items and the highest score was recognition of revenue when title passes net of royalties (n = 23, 92%). The last activity which is inventory management had 12 items, and the item with the highest score was using same formula to all inventories similar in nature or use to the company (n = 24, 96%).

Table 3: Descriptive results – highest score

Oil and Gas activity, items	F (n=25)	%
1. Exploration and Evaluation (E&E)		
• *The company write-offs post balance sheet dry holes costs*	*23*	*92.0*
2. Depletion, Depreciation and Amortization (DD&A)		
• *The company allocates the cost of an item of PPE into components and depreciate each of them separately*	*25*	*100.0*
3. Decommissioning and environmental provisions		
• *The company recognises provision for the dismantlement of wellheads when the obligation is incurred*	*24*	*96.0*
4. Business combinations and joint arrangements		
• *The company recognises share of jointly controlled assets, liabilities, expense and income*	*23*	*92.0*
5. Farm-ins and farm-outs		
• *The company recognises gain or loss on farm-in and farm-outs in the E&E phase*	*11*	*44.0*
6. Revenue recognition		
• *The company recognises revenue when title passes, net of royalties*	*23*	*92.0*
7. Inventory Management (Valuation)		
• *The company uses the same formula to all inventories similar in nature or use to the company*	*24*	*96.0*

Table 4 presents results for items with the lowest score. According to Table 4, in the case of E&E, the item with the lowest score was application of reserve recognition accounting method, that is RRA (n = 8, 32%). For DD&A the item with the lowest score was use of other approaches to measure present reserve estimates (n = 1, 4%). Considering decommissioning and environmental provisions, the item with the lowest score was concerned with not recognising deferred taxes at initial recognition of decommissioning liability (n = 7, 28%). In business combinations and joint arrangements, the item with lowest score was use of fresh-start accounting method (n = 2, 8%). For farm-ins and farm-outs the item with lowest score was not recognising any gain or loss arising from utilisation (n = 2, 8%). The revenue recognition activity had two items with lowest score. The first was offsetting against assets proceeds from production sales (n = 3, 12%), and the second was recognition of revenue arising from the sale under volumetric production payments (VPP) contract over the production (n= 3, 12%). For inventory management, the item with the lowest score was treating excess of line fill and cushion gas as inventory (n = 1, 4%).

Table 4: Descriptive results – lowest score

Oil and Gas activity, items	F (n=25)	%
1. Exploration and Evaluation (E&E)		
• *The company applies reserve recognition accounting method (RRA)*	*8*	*32.0*
2. Depletion, Depreciation and Amortization (DD&A)		
• *The company uses other approaches to measure present reserve estimates*	*1*	*4.0*
3. Decommissioning and Environmental provisions		
• *The company does not recognise deferred taxes at initial recognition of decommissioning liability*	*7*	*28.0*
4. Business combinations and joint arrangements		
• *The company uses fresh-start accounting method for business combination*	*2*	*8.0*
5. Farm-ins and Farm-outs		
• *The company does not recognise any gain or loss arising from utilisation*	*2*	*8.0*
6. Revenue recognition		
• *The company offsets against the assets proceeds from pre-production sales*	*3*	*12.0*
• *The company recognises revenue arising from the sale under volumetric production payments (VPP) contract over the production life of VPP*	*3*	*12.0*
7. Inventory Management (Valuation)		
• *The company treats excess of line fill and cushion gas as inventory*	*1*	*4.0*

Inferential statistics
In this study, four hypotheses were developed for testing. The first hypothesis stated: *The oil and gas companies apply different choices of accounting treatment for their activities i.e. there is a significant variation (heterogeneity) of accounting choices among oil and gas companies.* This was tested using one-sample chi-square. The results show (as presented in Table 5) that out of 83 accounting treatment choices, 68 accounting choices the companies have, have chi-square values ranging from 4.167 (p-value = 0.041) to 38.72 (p-value = 0.000). In this case, 68 accounting choices were found to be significant at 5% significance level. This implies that out of 83 accounting choices assessed, the companies were found to use a different approach for 68 accounting choices. On the other hand, 14 accounting treatment choices were found not to be significant because their chi-square values ranged between 0.167 (p-value = 0.683) and 5.250 (p-value = 0.072). A two variables chi-square test could not be performed because they were constant.

The second hypothesis stated: *The choice of accounting treatment for oil and gas activities is significantly influenced by the size of the company.* Mann-Whitney U test was used, and size

was classified into two groups with large and small companies. For size, the results of Mann-Whitney U test (as presented on Table 6) show that Mann-Whitney values ranged between 41.5 and 71.5 while significance level ranged (p-value = 0.049 for 2-tailed test and 0.082 for 1-tailed test) to (p-value =1.000 for both 2-tailed and 1-tailed tests). These results show that size had strong significant influence on only one item which was initial measuring decommissioning liabilities and related capitalised assets at the best estimate of the costs required to settle decommissioning liability or to transfer it to a third party (Mann-Whitney test = 49.5, p = 0.049 for 2-tailed test). In addition, size had weak significant influence on three items. The first item was using proved developed reserves as a basis for unit of production (UoP) with Mann-Whitney test = 55.0 and p-value = 0.096 for 2-tailed test. The second item was using fair value to measure non-controlling interests (Mann-Whitney test = 55, p = 0.096 for 2-tailed test). The third item was recognising both cash payments received and value of future assets to be received in case of unproven reserves (Mann-Whitney test = 41.5, p = 0.064 for 2-tailed test). For the remaining items of accounting treatment, there were no statistical significant differences between large and small companies.

The third hypothesis stated: *The choice of accounting treatment for oil and gas activities is significantly influenced by the location of the company.* This was also tested using Mann-Whitney test because location was categorised in terms of 'commercially-oriented' and 'government-oriented'. The results for this third hypothesis are presented in Table 7. The results, as presented on Table 7, indicate that location had significant influence on five items. Out of these five items, location had strong significant influence on two items (i.e. significant at 5%). The first item used LIFO to value inventories (Mann-Whitney test = 30.0, p = 0.002 for 2-tailed test), and the second item was not recognising deferred taxes at initial recognition of the decommissioning liability (Mann-Whitney test = 36.0, p = 0.009 for 2-tailed test). For the items in which location had weak significant influence (significant 10%) there were three of them. The first item was the application of successful efforts method (Mann-Whitney test = 60.0, p = 0.083 for 2-tailed test). The second item was recognition of cash payments received only in case of unproven reserves (Mann-Whitney test = 48, p = 0.070). The last item was recognition of provision for physical restoration of an area of activity to its original or better than original condition (Mann-Whitney = 60.0, p = 0.083 for 2-tailed test). For the remaining items of accounting treatment, the results indicate that there was no statistically significant difference between the two groups of companies (based on location).

The fourth hypothesis stated: *The choice of accounting treatment for oil and gas activities is significantly influenced by duration of the company.* This was tested using Kruskal-Wallis. The results of Kruskal-Wallis test show that Chi-Square values range between 0.000 (with Asymp. Sig. 1.000) to 12.217 (with Asymp. Sig. 0.032) (see Table 8). These results of Kruskal-Wallis test as presented in Table 8 show that there was no statistically significant difference between the duration of companies with respect to all accounting treatment choices except for two accounting treatment choices. The two accounting treatment choices which showed significant results were using the reducing balance method to depreciate assets (Chi-Square = 11.500, Asymp. Sig. 0.042) and not recognising deferred taxes at initial recognition of the decommissioning liability (Chi-Square = 12.217, Asymp. Sig. 0.032).

DISCUSSION OF THE FINDINGS

This study aimed at addressing two issues as a far as accounting for oil and gas is concerned - the variation of choices of accounting treatment and factors influencing the choices for accounting treatment. In the case of choice of accounting treatment, this study found out that

there were significant variations of accounting treatment of oil and gas activities. These findings were consistent with previous works by accounting firms such as Ernst and Young (2009), KPMG (2008, 2011) as well as PWC (2011). According to the works of these accounting firms, possible reasons for the significant variation of a number of accounting choices include presence of different accounting treatment without clear guidelines on which treatment should be used (this applies for both US GAAP and IFRS). Another reason is that lack of a clear definition of approaches creates room for variation (for example according to IFRS, in case of E&E activities, companies can use ether the Full Cost Approach or Successful Efforts Approach, but the definition is not clearly provided).

These findings likewise are consistent with a number of sources of empirical literature (Barth, *et al*., 2008; Fields, *et al*., 2001; Misund, 2017; Mulford & Comiskey, 2002). These studies argue that variation (heterogeneity) in accounting treatment is based on flexibility provided by accounting principles. As argued by Fields *et al*. (2001), using three perspectives - PAT, AT and IT - it is more likely that similar companies would select different accounting choices to treat their transactions. However, these findings were not consistent with DeAngelo, H. (1994) and DeAngelo, L. and Skinner (1994) as well as Collin *et al*. (2009) who considered that similarity in business is expected to bring similar accounting treatment choices. One plausible reason for our findings could be the accounting dilemma facing the oil and gas sector as propounded by other studies (Jennings *et al*., 2000; Larcker & Revsine, 1983; Mulford & Comiskey, 2004).

In case of the determinants for the choice of accounting treatment, the study used three variables: company size, company location as well as company duration. In the case of company size, the study found that it has got influence on only four items. It has got strong influence on initial measurements of decommissioning liabilities and related capitalised assets. In addition, company size was found to have weak influence on using proved reserves as a basis for unit of production, using fair value as well as recognition of both cash payments and value of future assets in case of unproven reserves. For these five items, it could be argued that there is a difference in accounting treatment between small and large oil and gas companies. These findings are consistent with studies such as Hagerman & Zmijewski (1979), Malmquist (1990), Waweru *et al*. (2011) and Watts and Zimmerman (1978) who found that accounting treatments in oil and gas companies tend to differ between large and small companies. However, for the majority of items which are the remaining ones, the size was found to have no influence on a particular choice of accounting treatment. This is not consistent with studies which found that size is a significant factor in influencing accounting treatment choice. Plausible reasons could be, first because the companies selected are major global companies then the size might not make a big difference. Second, those items for which significant difference is observed could be more sophisticated hence requiring a more complex accounting system which small organisations may not be able to afford.

On the issue of location, the study found that there is a difference between oil and gas companies in commercially-oriented countries and those in government-oriented countries on five items. Location was found to have strong influence on two items: using LIFO to value inventories and not recognising deferred taxes at initial recognition of decommissioning liability. It was also found to have weak influence on the application of successful efforts method, recognition of cash payments received only in case of unproven reserves as well as recognition of provision for physical restoration of an area to its original conditions or better. Although there are five items with significant results, the majority (remaining items) are not

significant as far as location is concerned. These results are not consistent with studies which consider that location has got influence on accounting treatment choices (see Cole *et al.*, 2011; Doupnik & Taylor, 1985; Hagerman & Zmijewski, 1979; Jaafar & McLeay, 2007; and Nobes, 2008, 2011). These findings may be consistent with the Institutional Theory which stipulates that similar companies tend to have homogeneity of accounting treatment despite the location (Collin *et al.*, 2009). In addition, it may be consistent with PAT which considers opportunistic behaviour of managers regardless of the location of the company. However, these findings may not be consistent with the Contingency Theory because an environmental factor like location has got very limited influence on the selection of a particular accounting treatment choice.

In the case of duration, this was found not to have significant influence on all variables of accounting choice except depreciation methods (using reducing balance approach) and treatment of deferred taxes (not recognising deferred taxes). For the two items, the findings are consistent with previous studies concerned with the age of the company which found that there is relationship between age and accounting treatment choice (Lilien & Pastena, 1982). On the other hand, these results are not consistent with studies which found that there is no relationship (Deakin, 1979; Dichev & Li, 2013). The possible reason for this difference could be linked to tax saving. Haverals (2007) opines that companies will switch to a depreciation method that will reduce tax burden.

CONCLUSIONS AND IMPLICATION OF THE STUDY
The study had two objectives; the first objective was to determine whether oil and gas companies apply different accounting treatment choices, while the second was to identify organisational determinants influencing accounting treatment choices. The investigation used seven issues reflecting major activities of oil and gas: E&E, DD&A, decommissioning and environmental provision, business combinations and joint arrangement, farm-ins and farm-outs, revenue recognition as well as inventory management. In conclusion, the empirical results of this study indicate that regarding accounting treatment choices, there are significant variations in accounting treatment. Based on these issues, the empirical results show that areas where there are major variations are found in farm-ins and farm-outs, inventory management, E&E assets as well as business combinations and joint arrangements. The area with least variation is DD&A. On the other hand, on determinants for accounting treatment choice, this study used three factors, namely, size, location and duration. The study found that size has influence on only four items. These items are initial measuring decommissioning liability, using proved reserves as a basis for unit of production, using fair value as well as recognition of both cash payments and value of future assets in case of unproven reserves. The study also found that location has influence on five items. These items are use of LIFO to value inventories, not recognising deferred taxes at initial recognition of decommissioning liability, use of proved reserves as a basis for unit of production, recognition of cash payments received only in case of unproven reserves as well as application of successful efforts. Duration has influence on two items, namely, use of a reducing balance method to depreciate its assets as well as not recognising deferred taxes at initial recognition of decommissioning liability.

The results of this study should be of interest to both accounting standard setters and oil and gas companies because they do not only show how accounting treatment of oil and gas activities varies but also identify critical success factors. In relation to accounting standard setters, this shows that oil and gas companies tend to use different accounting treatment

choices hence reduce comparability quality of the financial statements. As such, accounting standard setters need to come up with clear guidelines to harmonise accounting treatment of oil and gas activities. This can only be achieved if the politicised process of making accounting standards could be minimised to reduce adverse effects (Misund, 2017). These guidelines should take into consideration the nature of the company - whether it is growing up or mature. Likewise, in response to this situation, regulatory authorities may need to impose specific regulations on accounting treatment of oil and gas activities. Again, the guidelines should strike a balance between accounting flexibility and accounting rigidity because while lack of homogeneity may compromise comparability, it can increase informativeness of accounting data by presenting uniqueness of each company (Palepu *et al*., 2000). For oil and gas companies, this study shows that there are a lot of choices for accounting treatment; as such, there is a need to select those treatment choices which will not confuse investors.

There are a couple of limitations in this study. First, the study used only a small sample of 25 companies; it is possible that if many companies were involved, results could be different. Second, this study used non-parametric tests, so future studies may use parametric tests to assess the same topic. Finally, the study has not assessed the perception of users of financial reports of oil and gas companies on comparability of the financial reports. Hence, it will be interesting for future studies to see how comparable financial reports are, from a user perspective.

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Appendix: Tables for statistical analysis
Table 5: Chi-square test

	Item	Chi-Square value	Sig.
1	The company applies successful efforts method (SE)	33.680	0.000
2	The company applies cost accounting method (FC)	28.880	0.000
3	The company applies reserve recognition accounting method (RRA)	6.250	0.044
4	E&E assets recognised are classified as tangible assets	8.720	0.012
5	E&E assets recognised are classified as intangible assets	11.840	0.003
6	The company initially capitalises E&E assets as intangibles and reclassify when the development decision is taken as PPE	15.680	0.000
7	The company capitalises exploration expenditure as an intangible and amortise it on straight line basis over contractually established period of exploration	9.680	0.008
8	The company capitalises exploration costs as tangible assets within Construction in Progress or PPE from commencement of the exploration	9.920	0.007
9	**The company capitalises costs of side tracks**	**3.920**	**0.141**
10	**The company write-off the cost of side tracks (expense)**	**5.360**	**0.069**
11	The company capitalises the costs of suspended (abandoned) wells	17.360	0.000
12	The company writes-off the costs of suspended (abandoned) wells	17.360	0.000
13	The company capitalises post balance sheet dry holes costs	38.720	0.000
14	The company writes-off post balance sheet dry holes costs	28.880	0.000
15	**The company allocates the cost of an item of PPE into components and depreciate each of them separately**	**The variable is constant, hence chi-square test could not be performed**	
16	The company uses the straight-line method to depreciate its assets	21.160	0.000
17	The company uses the reducing balance method to depreciate its assets	21.160	0.000
18	The company uses units of production method to deplete upstream oil and gas assets	38.720	0.000
19	In assets swaps, the company accounts exchange of one non-monetary assets for another at fair value	12.250	0.002
20	**The company recognises a gain or loss based on the difference between the book value and fair value of asset relinquished during assets swaps**	**5.250**	**0.072**
21	The company uses volume of reserve as a basis for calculating the effects associated with DD&A	24.560	0.000
22	The company uses 2P (proven and probable) to measure and present reserve estimates	21.160	0.000
23	The company uses other approaches to measure present reserve estimates	25.040	0.000
24	The company uses proved developed reserves as basis for UoP (Units of Production)	33.680	0.000
25	The company uses both proved and probable reserves as a basis for UoP calculation.	13.520	0.001
26	The company recognises provision for plugging and abandonment of wells costs when obligation is incurred	17.640	0.000
27	The company recognises provision for the dismantlement of wellheads costs when the obligation is incurred	21.160	0.000
28	The company recognises provision for the production and transportation costs when obligation is incurred	31.750	0.000
29	The company recognises provision for the physical restoration of an area of activity to its original or better	33.680	0.000

	Item	Chi-Square value	Sig.
	than original condition		
30	**The company recognises obligation to occur based on legal obligation**	**1.000**	**0.317**
31	The company recognises a liability based on both legal and constructive obligations	17.640	0.000
32	The company initially measures decommissioning liabilities and related capitalises costs at fair value	8.720	0.013
33	The company initially measures decommissioning liabilities and related capitalised assets at the best estimate of the costs required to settle decommissioning liability or to transfer it to a third party	24.560	0.000
34	The company recognises deferred taxes upon initial recognition of the ARO asset and liability	20.720	0.000
35	The company does not recognises deferred taxes at initial recognition of the decommissioning liability	8.960	0.011
36	The company uses equity method to account for jointly controlled assets	6.760	0.009
37	The company uses proportionate consolidation of jointly controlled assets	9.750	0.008
38	The company recognises gain on formation of joint venture	9.364	0.009
39	The company recognises share of jointly controlled assets, liabilities, expense and income	20.167	0.000
40	For jointly controlled operations, the company recognises costs incurred and revenue generated from transactions with third parties	9.750	0.008
41	For jointly controlled operations, the company recognises controlled assets, liabilities incurred and expenses incurred through the process of pursuing the joint operation and its share of income	22.750	0.000
42	For jointly controlled entities, the company uses equity method	4.840	0.028
43	**For jointly controlled entities, the company uses proportionate consolidation method**	**1.960**	**0.162**
44	The company uses pooling-of-interest method to account for business combination	24.560	0.000
45	The company uses acquisition (purchase) method to account for business combination	9.478	0.009
46	The company uses fresh start accounting method to account for business combination	14.480	0.000
47	The company uses fair value to measure non-controlling interest	33.680	0.000
48	The company uses its proportionate share of the fair value of the identifiable net assets excluding goodwill to measure non-controlling interests	7.760	0.021
49	**The company does not recognise gain or loss on farm-in and farm-outs in the E&E phase**	**2.240**	**0.326**
50	**The company recognises gain or loss on farm-in and farm-outs in the E&E phase**	**5.120**	**0.077**
51	**The company does not recognise gain or loss on farm-ins and farm-outs in the development phase**	**5.120**	**0.077**
52	**The company recognises gain or loss on farm-ins and farm-outs in the development phase**	**3.440**	**0.179**
53	In case of unproven reserves, the company recognises only cash payments received and does not recognise any consideration in the respect of the value of work performed	6.080	0.048
54	**In case of unproven reserves, the company recognises both cash payments received and value of future asset**	**0.250**	**0.882**

	Item	Chi-Square value	Sig.
	to be received when asset is put into operation		
55	**In case of unproven reserves, the company recognises both cash payments received and value of future assets to be received and recognises future asset receivable when agreement is signed**	**1.040**	**0.594**
56	In case of unitisation, the company uses a pooling of assets approach	29.120	0.000
57	The company does not recognise any gain or loss arising from unitization	28.880	0.000
58	The company recognises revenue when title passes, net of royalties	38.720	0.000
59	The company recognises revenue using entitlement method approach	11.043	0.004
60	In case of overlift, the company recognises it as a purchase	2.667	0.102
61	The company treats overlift as a liability at market price at the date of lifting.	4.167	0.041
62	In case of underlift, the company recognises it as a sale at market price	4.167	0.041
63	**The company treats underlift as an asset at the market price of oil and gas at the date of lifting**	**2.667**	**0.102**
64	The company recognises revenue arising from each transaction based on the terms of the underlying sales agreement	The variable is constant, hence chi-square test could not be performed	
65	The company recognises revenue when oil and gas is lifted from the production site	11.840	0.003
66	The company recognises revenue when crude oil and gas is delivered to the refinery/storage depot	7.280	0.026
67	The company recognises revenue when crude oil and gas is delivered to the service station	14.480	0.000
68	The company offsets against the asset cost, proceeds from pre-production sales	18.750	0.000
69	The company recognises revenue arising from the sale under VPP (Volumetric Production Payments) contract over the production life of VPP	24.560	0.000
70	**The company recognises revenue gains and losses in product exchange (dissimilar products)**	**1.000**	**0.607**
71	The company accounts for at book value product exchanges (similar products)	10.750	0.005
72	The company account for at fair value the product exchange (similar products)	11.840	0.003
73	**The company uses specific identification method to value inventories**	**0.167**	**0.683**
74	The company uses weighted average method to value inventories	25.040	0.000
75	The company uses FIFO method to value inventories	13.520	0.001
76	The company uses LIFO method to value inventories	12.080	0.002
77	The company uses the same formula all inventories similar in nature or use to the entity	21.160	0.000
78	The company does not use the same formula to all inventories similar in nature or use to the entity	17.640	0.000
79	The company uses cost to value its inventories	8.167	0.004
80	The company uses net realisable value (NRV) to value its inventories	11.560	0.001
81	**The company uses fair value less cost to sell (FVLCTS) to value its inventories**	**0.167**	**0.683**

	Item	Chi-Square value	Sig.
82	The company treats line fill and cushion gas (required minimum level of product to be maintained to ensure that some PP&E operate efficiently) as part of PPE	16.880	0.000
83	The company treats line fill and cushion gas stored in PPE owned by third part as inventory	12.080	0.002
84	The company treats excess of line fill and cushion gas as inventory	23.250	0.000

Table 6: Mann-Whitney test (company size – large vs small)

	Items	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
1	The company applies successful efforts method (SE)	55.0	121.0	-1.664	0.096	0.361
2	The company applies cost accounting method (FC)	60.5	151.5	-0.982	0.326	0.531
3	The company applies reserve recognition accounting method (RRA)	52.5	143.5	-0.859	0.391	0.446
4	E&E assets recognised are classified as tangible assets	69.5	135.5	-0.134	0.894	0.910
5	E&E assets recognised are classified as intangible assets	62.5	128.5	-0.602	0.547	0.608
6	The company initially capitalises E&E assets as intangibles and reclassify when the development decision is taken as PPE	50.5	116.5	-1.475	0.140	0.228
7	The company capitalises exploration expenditure as an intangible and amortise it on straight line basis over contractually established period of exploration	51.5	117.5	-1.312	0.190	0.252
8	The company capitalises exploration costs as tangible assets within Construction in Progress or PPE from commencement of the exploration	63.0	154.0	-0.561	0.575	0.649
9	The company capitalises costs of side tracks	58.0	149.0	-0.849	0.396	0.459
10	The company write-off the cost of side tracks (expense)	54.0	145.0	-1.112	0.266	0.331
11	The company capitalises the costs of suspended (abandoned) wells	56.5	147.5	-1.090	0.276	0.392
12	The company writes-off the costs of suspended (abandoned) wells	58.5	124.5	-0.944	0.345	0.459
13	The company capitalises post balance sheet dry holes costs	71.5	137.5	0.000	1.000	1.000
14	The company writes-off post balance sheet dry holes costs	62.5	128.5	-0.804	0.422	0.608
15	The company allocates the cost of an item of PPE into components and depreciate each of them separately	71.5	137.5	0.000	1.000	1.000
16	The company uses the straight-line method to depreciate its assets	71.5	137.5	0.000	1.000	1.000
17	The company uses the reducing balance method to depreciate its assets	65.0	131.0	-1.087	0.277	0.733
18	The company uses units of production method to deplete upstream oil and gas assets	60.5	126.5	-1.329	0.184	0.531
19	In assets swaps, the company accounts exchange of one non-monetary assets for another at fair value	64.0	130.0	-0.522	0.602	0.691
20	The company recognises a gain or loss based on the difference between the book value and fair value of asset relinquished during assets swaps	56.5	122.5	-0.964	0.335	0.392
21	The company uses volume of reserve as a basis for calculating the effects associated with DD&A	57.5	123.5	-1.145	0.252	0.424
22	The company uses 2P (proven and probable) to measure and present reserve estimates	66.0	132.0	-0.920	0.358	0.776
23	The company uses other approaches to measure present reserve estimates	71.0	162.0	-0.045	0.964	1.000
24	The company uses proved developed reserves as basis for UoP (Units of Production)	55.0	121.0	-1.664	0.096	0.361
25	The company uses both proved and probable reserves	67.5	158.5	-0.273	0.785	0.820

	Items	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
	as a basis for UoP calculation.					
26	The company recognises provision for plugging and abandonment of wells costs when obligation is incurred	70.5	161.5	-0.121	0.904	0.955
27	The company recognises provision for the dismantlement of wellheads costs when the obligation is incurred	66.0	132.0	-0.920	0.358	0.776
28	The company recognises provision for the production and transportation costs when obligation is incurred	62.0	117.0	-0.318	0.751	0.879
29	The company recognises provision for the physical restoration of an area of activity to its original or better than original condition	66.0	132.0	-0.555	0.579	0.776
30	The company recognises obligation to occur based on legal obligation	64.5	130.5	-0.475	0.635	0.691
31	The company recognises a liability based on both legal and constructive obligations	66.0	132.0	-0.920	0.358	0.776
32	The company initially measures decommissioning liabilities and related capitalises costs at fair value	62.5	128.5	-0.602	0.547	0.608
33	The company initially measures decommissioning liabilities and related capitalised assets at the best estimate of the costs required to settle decommissioning liability or to transfer it to a third party	49.5	115.5	-1.967	0.049	0.207
34	The company recognises deferred taxes upon initial recognition of the ARO asset and liability	61.5	127.5	-0.765	0.444	0.569
35	The company does not recognises deferred taxes at initial recognition of the decommissioning liability	49.5	115.5	-1.447	0.148	0.207
36	The company uses equity method to account for jointly controlled assets	68.5	159.5	-0.232	0.817	0.865
37	The company uses proportionate consolidation of jointly controlled assets	55.0	121.0	-0.776	0.438	0.525
38	The company recognises gain on formation of joint venture	50.0	116.0	-0.407	0.684	0.756
39	The company recognises share of jointly controlled assets, liabilities, expense and income	60.5	126.5	-0.957	0.338	0.740
40	For jointly controlled operations, the company recognises costs incurred and revenue generated from transactions with third parties	66.0	132.0	0.000	1.000	1.000
41	For jointly controlled operations, the company recognises controlled assets, liabilities incurred and expenses incurred through the process of pursuing the joint operation and its share of income	64.0	142.0	-0.187	0.852	0.928
42	For jointly controlled entities, the company uses equity method	57.0	123.0	-1.066	0.286	0.424
43	For jointly controlled entities, the company uses proportionate consolidation method	67.5	133.5	-0.284	0.777	0.820
44	The company uses pooling-of-interest method to account for business combination	66.5	157.5	-0.409	0.683	0.776
45	The company uses acquisition (purchase) method to account for business combination	52.5	97.5	-0.459	0.646	0.695
46	The company uses fresh start accounting method to account for business combination	58.0	124.0	-0.981	0.327	0.459
47	The company uses fair value to measure non-controlling interest	55.0	121.0	-1.664	0.096	0.361

	Items	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
48	The company uses its proportionate share of the fair value of the identifiable net assets excluding goodwill to measure non-controlling interests	49.5	115.5	-1.422	0.155	0.207
49	The company does not recognise gain or loss on farm-in and farm-outs in the E&E phase	51.0	142.0	-1.281	0.200	0.252
50	The company recognises gain or loss on farm-in and farm-outs in the E&E phase	47.5	138.5	-1.525	0.127	0.167
51	The company does not recognise gain or loss on farm-ins and farm-outs in the development phase	55.0	146.0	-1.049	0.294	0.361
52	The company recognises gain or loss on farm-ins and farm-outs in the development phase	48.5	139.5	-1.462	0.144	0.186
53	In case of unproven reserves, the company recognises only cash payments received and does not recognise any consideration in the respect of the value of work performed	52.0	118.0	-1.246	0.213	0.277
54	In case of unproven reserves, the company recognises both cash payments received and value of future asset to be received when asset is put into operation	50.0	105.0	-0.989	0.323	0.376
55	In case of unproven reserves, the company recognises both cash payments received and value of future assets to be received and recognises future asset receivable when agreement is signed	41.5	107.5	-1.852	0.064	0.082
56	In case of unitisation, the company uses a pooling of assets approach	62.0	153.0	-0.849	0.396	0.608
57	The company does not recognise any gain or loss arising from unitization	60.5	151.5	-0.982	0.326	0.531
58	The company recognises revenue when title passes, net of royalties	66.0	132.0	-0.920	0.358	0.776
59	The company recognises revenue using entitlement method approach	57.5	123.5	-0.228	0.820	0.847
60	In case of overlift, the company recognises it as a purchase	59.0	114.0	-0.451	0.652	0.738
61	The company treats overlift as a liability at market price at the date of lifting.	64.5	155.5	-0.039	0.969	0.976
62	In case of underlift, the company recognises it as a sale at market price	64.5	155.5	-0.039	0.969	0.976
63	The company treats underlift as an asset at the market price of oil and gas at the date of lifting	59.0	114.0	-0.451	0.652	0.738
64	The company recognises revenue arising from each transaction based on the terms of the underlying sales agreement	71.5	137.5	0.000	1.000	1.000
65	The company recognises revenue when oil and gas is lifted from the production site	69.5	135.5	-0.134	0.894	0.910
66	The company recognises revenue when crude oil and gas is delivered to the refinery/storage depot	60.5	126.5	-0.711	0.477	0.531
67	The company recognises revenue when crude oil and gas is delivered to the service station	60.5	126.5	-0.768	0.443	0.531
68	The company offsets against the asset cost, proceeds from pre-production sales	53.0	131.0	-1.039	0.299	0.449
69	The company recognises revenue arising from the sale under VPP (Volumetric Production Payments) contract over the production life of VPP	62.5	128.5	-0.736	0.462	0.608
70	The company recognises revenue gains and losses in product exchange (dissimilar products)	62.5	117.5	-0.166	0.868	0.879
71	The company accounts for at book value product	62.0	117.0	-0.213	0.831	0.879

	Items	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
	exchanges (similar products)					
72	The company account for at fair value the product exchange (similar products)	66.5	132.5	-0.334	0.738	0.776
73	The company uses specific identification method to value inventories	57.5	135.5	-0.604	0.546	0.608
74	The company uses weighted average method to value inventories	62.0	153.0	-0.778	0.436	0.608
75	The company uses FIFO method to value inventories	47.0	113.0	-1.721	0.085	0.167
76	The company uses LIFO method to value inventories	62.5	153.5	-0.628	0.530	0.608
77	The company uses the same formula all inventories similar in nature or use to the entity	66.0	132.0	-0.920	0.358	0.776
78	The company does not use the same formula to all inventories similar in nature or use to the entity	70.5	136.5	-0.121	0.904	0.955
79	The company uses cost to value its inventories	62.0	153.0	-0.283	0.777	0.879
80	The company uses net realisable value (NRV) to value its inventories	67.0	133.0	-0.455	0.649	0.820
81	The company uses fair value less cost to sell (FVLCTS) to value its inventories	62.5	153.5	-0.179	0.858	0.879
82	The company treats line fill and cushion gas (required minimum level of product to be maintained to ensure that some PP&E operate efficiently) as part of PPE	68.0	159.0	-0.254	0.800	0.865
83	The company treats line fill and cushion gas stored in PPE owned by third part as inventory	70.5	161.5	-0.068	0.946	0.955
84	The company treats excess of line fill and cushion gas as inventory	53.5	144.5	-0.993	0.321	0.483

Table 7: Mann-Whitney U test (Company location – Commercially driven vs. Government)

		Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
1	The company applies successful efforts method (SE)	60.000	138.000	-1.735	0.083	0.347
2	The company applies cost accounting method (FC)	78.000	156.000	0.000	1.000	1.000
3	The company applies reserve recognition accounting method (RRA)	57.000	148.000	-0.937	0.349	0.424
4	E&E assets recognised are classified as tangible assets	74.000	152.000	-0.247	0.805	0.852
5	E&E assets recognised are classified as intangible assets	66.000	144.000	-0.760	0.448	0.538
6	The company initially capitalises E&E assets as intangibles and reclassify when the development decision is taken as PPE	66.000	144.000	-0.801	0.423	0.538
7	The company capitalises exploration expenditure as an intangible and amortise it on straight line basis over contractually established period of exploration	72.000	163.000	-0.370	0.712	0.769
8	The company capitalises exploration costs as tangible assets within Construction in Progress or PPE from commencement of the exploration	54.000	132.000	-1.482	0.138	0.205
9	The company capitalises costs of side tracks	74.000	152.000	-0.237	0.812	0.852
10	The company write-off the cost of side tracks (expense)	72.500	163.500	-0.329	0.742	0.769
11	The company capitalises the costs of suspended (abandoned) wells	61.500	152.500	-1.141	0.254	0.376
12	The company writes-off the costs of suspended (abandoned) wells	74.000	152.000	-0.276	0.782	0.852
13	The company capitalises post balance sheet dry holes costs	66.000	144.000	-1.387	0.166	0.538
14	The company writes-off post balance sheet dry holes costs	65.500	156.500	-1.066	0.286	0.503
15	The company allocates the cost of an item of PPE into components and depreciate each of them separately	78.000	156.000	0.000	1.000	1.000
16	The company uses the straight-line method to depreciate its assets	72.000	150.000	-0.961	0.337	0.769
17	The company uses the reducing balance method to depreciate its assets	72.000	163.000	-0.961	0.337	0.769
18	The company uses units of production method to deplete upstream oil and gas assets	66.000	144.000	-1.387	0.166	0.538
19	In assets swaps, the company accounts exchange of one non-monetary assets for another at fair value	70.000	148.000	-0.139	0.890	0.932
20	The company recognises a gain or loss based on the difference between the book value and fair value of asset relinquished during assets swaps	71.500	149.500	-0.032	0.974	0.977
21	The company uses volume of reserve as a basis for calculating the effects associated with DD&A	62.000	140.000	-1.248	0.212	0.406
22	The company uses 2P (proven and probable) to measure and present reserve estimates	72.000	150.000	-0.961	0.337	0.769
23	The company uses other approaches to measure present reserve estimates	72.000	150.000	-0.469	0.639	0.769
24	The company uses proved developed reserves as basis for UoP (Units of Production)	60.000	138.000	-1.735	0.083	0.347
25	The company uses both proved and probable reserves as a basis for UoP calculation.	72.000	163.000	-0.388	0.698	0.769
26	The company recognises provision for plugging and abandonment of wells costs when obligation is incurred	77.500	168.500	-0.058	0.954	0.979
27	The company recognises provision for the dismantlement of wellheads costs when the obligation is incurred	72.000	150.000	-0.961	0.337	0.769
28	The company recognises provision for the production and transportation costs when obligation is incurred	67.500	133.500	-0.403	0.687	0.820
29	The company recognises provision for the physical restoration of	60.000	138.000	-1.735	0.083	0.347

		Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
	an area of activity to its original or better than original condition					
30	The company recognises obligation to occur based on legal obligation	68.000	146.000	-0.641	0.522	0.611
31	The company recognises a liability based on both legal and constructive obligations	66.000	144.000	-1.388	0.165	0.538
32	The company initially measures decommissioning liabilities and related capitalises costs at fair value	58.000	136.000	-1.233	0.218	0.295
33	The company initially measures decommissioning liabilities and related capitalised assets at the best estimate of the costs required to settle decommissioning liability or to transfer it to a third party	59.500	137.500	-1.443	0.149	0.320
34	The company recognises deferred taxes upon initial recognition of the ARO asset and liability	66.000	144.000	-0.874	0.382	0.538
35	The company does not recognises deferred taxes at initial recognition of the decommissioning liability	36.000	114.000	-2.618	0.009	0.022
36	The company uses equity method to account for jointly controlled assets	76.500	167.500	-0.110	0.912	0.936
37	The company uses proportionate consolidation of jointly controlled assets	57.000	135.000	-0.987	0.324	0.410
38	The company recognises gain on formation of joint venture	48.500	126.500	-0.888	0.375	0.456
39	The company recognises share of jointly controlled assets, liabilities, expense and income	66.000	144.000	-1.000	0.317	0.755
40	For jointly controlled operations, the company recognises costs incurred and revenue generated from transactions with third parties	63.500	141.500	-0.559	0.576	0.630
41	For jointly controlled operations, the company recognises controlled assets, liabilities incurred and expenses incurred through the process of pursuing the joint operation and its share of income	66.500	144.500	-0.448	0.654	0.755
42	For jointly controlled entities, the company uses equity method	73.500	151.500	-0.314	0.753	0.810
43	For jointly controlled entities, the company uses proportionate consolidation method	61.500	152.500	-1.079	0.281	0.376
44	The company uses pooling-of-interest method to account for business combination	61.500	152.500	-1.287	0.198	0.376
45	The company uses acquisition (purchase) method to account for business combination	48.000	126.000	-1.282	0.200	0.288
46	The company uses fresh start accounting method to account for business combination	67.500	145.500	-0.697	0.486	0.574
47	The company uses fair value to measure non-controlling interest	72.000	150.000	-0.578	0.563	0.769
48	The company uses its proportionate share of the fair value of the identifiable net assets excluding goodwill to measure non-controlling interests	63.500	141.500	-0.884	0.377	0.437
49	The company does not recognise gain or loss on farm-in and farm-outs in the E&E phase	71.000	149.000	-0.410	0.682	0.728
50	The company recognises gain or loss on farm-in and farm-outs in the E&E phase	78.000	156.000	0.000	1.000	1.000
51	The company does not recognise gain or loss on farm-ins and farm-outs in the development phase	71.000	149.000	-0.418	0.676	0.728
52	The company recognises gain or loss on farm-ins and farm-outs in the development phase	74.500	152.500	-0.207	0.836	0.852
53	In case of unproven reserves, the company recognises only cash payments received and does not recognise any consideration in the respect of the value of work performed	48.000	126.000	-1.811	0.070	0.110
54	In case of unproven reserves, the company recognises both cash payments received and value of future asset to be received when	52.000	118.000	-1.200	0.230	0.277

		Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
	asset is put into operation					
55	In case of unproven reserves, the company recognises both cash payments received and value of future assets to be received and recognises future asset receivable when agreement is signed	59.000	137.000	-1.104	0.270	0.320
56	In case of unitisation, the company uses a pooling of assets approach	67.000	158.000	-0.939	0.348	0.574
57	The company does not recognise any gain or loss arising from unitization	67.500	158.500	-0.895	0.371	0.574
58	The company recognises revenue when title passes, net of royalties	66.000	144.000	-1.387	0.166	0.538
59	The company recognises revenue using entitlement method approach	49.500	115.500	-1.186	0.236	0.316
60	In case of overlift, the company recognises it as a purchase	63.500	154.500	-0.567	0.571	0.649
61	The company treats overlift as a liability at market price at the date of lifting.	69.000	160.000	-0.184	0.854	0.910
62	In case of underlift, the company recognises it as a sale at market price	69.000	160.000	-0.184	0.854	0.910
63	The company treats underlift as an asset at the market price of oil and gas at the date of lifting	63.500	154.500	-0.567	0.571	0.649
64	The company recognises revenue arising from each transaction based on the terms of the underlying sales agreement	78.000	156.000	0.000	1.000	1.000
65	The company recognises revenue when oil and gas is lifted from the production site	66.000	157.000	-0.760	0.448	0.538
66	The company recognises revenue when crude oil and gas is delivered to the refinery/storage depot	69.000	147.000	-0.546	0.585	0.650
67	The company recognises revenue when crude oil and gas is delivered to the service station	64.500	142.500	-0.896	0.370	0.470
68	The company offsets against the asset cost, proceeds from pre-production sales	57.000	135.000	-1.142	0.254	0.410
69	The company recognises revenue arising from the sale under VPP (Volumetric Production Payments) contract over the production life of VPP	72.500	163.500	-0.429	0.668	0.769
70	The company recognises revenue gains and losses in product exchange (dissimilar products)	56.500	147.500	-0.928	0.353	0.392
71	The company accounts for at book value product exchanges (similar products)	54.500	120.500	-1.137	0.255	0.331
72	The company account for at fair value the product exchange (similar products)	65.000	143.000	-0.823	0.411	0.503
73	The company uses specific identification method to value inventories	54.000	132.000	-1.203	0.229	0.319
74	The company uses weighted average method to value inventories	74.500	152.500	-0.273	0.784	0.852
75	The company uses FIFO method to value inventories	63.500	154.500	-0.939	0.348	0.437
76	The company uses LIFO method to value inventories	30.000	121.000	-3.084	0.002	0.008
77	The company uses the same formula all inventories similar in nature or use to the entity	71.500	162.500	-1.041	0.298	0.728
78	The company does not use the same formula to all inventories similar in nature or use to the entity	65.000	143.000	-1.504	0.133	0.503
79	The company uses cost to value its inventories	68.000	134.000	-0.288	0.773	0.865
80	The company uses net realisable value (NRV) to value its inventories	77.000	168.000	-0.086	0.932	0.979
81	The company uses fair value less cost to sell (FVLCTS) to value its inventories	71.000	137.000	-0.034	0.973	1.000
82	The company treats line fill and cushion gas (required minimum level of product to be maintained to ensure that some PP&E operate efficiently) as part of PPE	76.000	167.000	-0.138	0.890	0.936

		Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
83	The company treats line fill and cushion gas stored in PPE owned by third part as inventory	74.500	165.500	-0.225	0.822	0.852
84	The company treats excess of line fill and cushion gas as inventory	67.500	145.500	-0.367	0.713	0.799

Table 8: Kruskall Wallis test (Company Duration)

		Chi-Square	df	Asymp. Sig.
1	The company applies successful efforts method (SE)	3.014	5	0.698
2	The company applies cost accounting method (FC)	2.667	5	0.751
3	The company applies reserve recognition accounting method (RRA)	4.262	5	0.512
4	E&E assets recognised are classified as tangible assets	3.890	5	0.565
5	E&E assets recognised are classified as intangible assets	2.544	5	0.770
6	The company initially capitalises E&E assets as intangibles and reclassify when the development decision is taken as PPE	4.309	5	0.506
7	The company capitalises exploration expenditure as an intangible and amortise it on straight line basis over contractually established period of exploration	2.251	5	0.813
8	The company capitalises exploration costs as tangible assets within Construction in progress or PPE from commencement of the exploration	4.095	5	0.536
9	The company capitalises costs of side tracks	8.931	5	0.112
10	The company write-off the cost of side tracks (expense)	5.337	5	0.376
11	The company capitalises the costs of suspended (abandoned) wells	3.610	5	0.607
12	The company writes-off the costs of suspended (abandoned) wells	5.432	5	0.365
13	The company capitalises post balance sheet dry holes costs	0.000	5	1.000
14	The company writes-off post balance sheet dry holes costs	1.992	5	0.85
15	The company allocates the cost of an item of PPE into components and depreciate each of them separately	0.000	5	1.000
16	The company uses the straight-line method to depreciate its assets	3.167	5	0.674
17	The company uses the reducing balance method to depreciate its assets	11.500	5	0.042
18	The company uses units of production method to deplete upstream oil and gas assets	3.704	5	0.593
19	In assets swaps, the company accounts exchange of one non-monetary assets for another at fair value	3.611	5	0.607
20	The company recognises a gain or loss based on the difference between the book value and fair value of asset relinquished during assets swaps	1.184	5	0.946
21	The company uses volume of reserve as a basis for calculating the effects associated with DD&A	1.383	5	0.926
22	The company uses 2P (proven and probable) to measure and present reserve estimates	1.778	5	0.879
23	The company uses other approaches to measure present reserve estimates	5.002	5	0.416
24	The company uses proved developed reserves as basis for UoP (Units of Production)	2.319	5	0.803
25	The company uses both proved and probable reserves as a basis for UoP calculation.	2.417	5	0.789
26	The company recognises provision for plugging and abandonment of wells costs when obligation is incurred	3.710	5	0.592
27	The company recognises provision for the dismantlement of wellheads costs when the obligation is incurred	1.778	5	0.879
28	The company recognises provision for the production and transportation costs when obligation is incurred	1.323	5	0.933
29	The company recognises provision for the physical restoration of an area of	6.527	5	0.258

		Chi-Square	df	Asymp. Sig.
	activity to its original or better than original condition			
30	The company recognises obligation to occur based on legal obligation	2.000	5	0.849
31	The company recognises a liability based on both legal and constructive obligations	1.536	5	0.909
32	The company initially measures decommissioning liabilities and related capitalises costs at fair value	3.030	5	0.695
33	The company initially measures decommissioning liabilities and related capitalised assets at the best estimate of the costs required to settle decommissioning liability or to transfer it to a third party	3.434	5	0.633
34	The company recognises deferred taxes upon initial recognition of the ARO asset and liability	8.325	5	0.139
35	The company does not recognises deferred taxes at initial recognition of the decommissioning liability	12.217	5	0.032
36	The company uses equity method to account for jointly controlled assets	6.164	5	0.291
37	The company uses proportionate consolidation of jointly controlled assets	5.017	5	0.414
38	The company recognises gain on formation of joint venture	4.089	5	0.537
39	The company recognises share of jointly controlled assets, liabilities, expense and income	1.667	5	0.893
40	For jointly controlled operations, the company recognises costs incurred and revenue generated from transactions with third parties	1.202	5	0.945
41	For jointly controlled operations, the company recognises controlled assets, liabilities incurred and expenses incurred through the process of pursuing the joint operation and its share of income	3.375	5	0.642
42	For jointly controlled entities, the company uses equity method	5.746	5	0.332
43	For jointly controlled entities, the company uses proportionate consolidation method	9.185	5	0.102
44	The company uses pooling-of-interest method to account for business combination	3.155	5	0.676
45	The company uses acquisition (purchase) method to account for business combination	4.078	5	0.538
46	The company uses fresh start accounting method to account for business combination	0.763	5	0.979
47	The company uses fair value to measure non-controlling interest	7.554	5	0.183
48	The company uses its proportionate share of the fair value of the identifiable net assets excluding goodwill to measure non-controlling interests	5.128	5	0.400
49	The company does not recognise gain or loss on farm-in and farm-outs in the E&E phase	2.356	5	0.798
50	The company recognises gain or loss on farm-in and farm-outs in the E&E phase	1.636	5	0.897
51	The company does not recognise gain or loss on farm-ins and farm-outs in the development phase	3.383	5	0.641
52	The company recognises gain or loss on farm-ins and farm-outs in the development phase	1.096	5	0.954
53	In case of unproven reserves, the company recognises only cash payments received and does not recognise any consideration in the respect of the value of work performed	5.392	5	0.37
54	In case of unproven reserves, the company recognises both cash payments received and value of future asset to be received when asset is put into operation	5.177	5	0.395
55	In case of unproven reserves, the company recognises both cash payments received and value of future assets to be received and recognises future asset receivable when agreement is signed	8.370	5	0.137
56	In case of unitization, the company uses a pooling of assets approach	4.125	5	0.532
57	The company does not recognise any gain or loss arising from unitization	4.248	5	0.514
58	The company recognises revenue when title passes, net of royalties	6.597	5	0.252

		Chi-Square	df	Asymp. Sig.
59	The company recognises revenue using entitlement method approach	4.407	5	0.492
60	In case of overlift, the company recognises it as a purchase	2.851	5	0.723
61	The company treats overlift as a liability at market price at the date of lifting.	3.183	5	0.672
62	In case of underlift, the company recognises it as a sale at market price	3.183	5	0.672
63	The company treats underlift as an asset at the market price of oil and gas at the date of lifting	2.851	5	0.723
64	The company recognises revenue arising from each transaction based on the terms of the underlying sales agreement	0.000	5	1.000
65	The company recognises revenue when oil and gas is lifted from the production site	7.044	5	0.217
66	The company recognises revenue when crude oil and gas is delivered to the refinery/storage depot	1.313	5	0.934
67	The company recognises revenue when crude oil and gas is delivered to the service station	4.675	5	0.457
68	The company offsets against the asset cost, proceeds from pre-production sales	3.607	5	0.607
69	The company recognises revenue arising from the sale under VPP (Volumetric Production Payments) contract over the production life of VPP	3.027	5	0.696
70	The company recognises revenue gains and losses in product exchange (dissimilar products)	2.510	5	0.775
71	The company accounts for at book value product exchanges (similar products)	3.499	5	0.624
72	The company account for at fair value the product exchange (similar products)	3.465	5	0.629
73	The company uses specific identification method to value inventories	3.217	5	0.667
74	The company uses weighted average method to value inventories	2.709	5	0.745
75	The company uses FIFO method to value inventories	4.229	5	0.517
76	The company uses LIFO method to value inventories	8.589	5	0.127
77	The company uses the same formula all inventories similar in nature or use to the entity	1.778	5	0.879
78	The company does not use the same formula to all inventories similar in nature or use to the entity	3.710	5	0.592
79	The company uses cost to value its inventories	5.084	5	0.406
80	The company uses net realizable value (NRV) to value its inventories	3.365	5	0.644
81	The company uses fair value less cost to sell (FVLCTS) to value its inventories	5.415	5	0.367
82	The company treats line fill and cushion gas (required minimum level of product to be maintained to ensure that some PP&E operate efficiently) as part of PPE	6.784	5	0.237
83	The company treats line fill and cushion gas stored in PPE owned by third part as inventory	5.289	5	0.382
84	The company treats excess of line fill and cushion gas as inventory	8.159	5	0.148