Implications of Transitioning to IFRS on Key Financial Indicators in The Oil and Gas Production Industry

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Globalization is changing the landscape of the investment world. A shift away from national capital markets to global capital markets has led to a movement towards a set of globally accepted accounting standards, International Financial Reporting Standards (IFRS). Guided by the measurement perspective to accounting and financial market research and in line with the literature on fundamental analysis, this research built on the empirically tested notion that a firm's intrinsic equity value can be measured by examining accounting information such as growth, risk, and earnings as well as other non-accounting information sources. A transition to IFRS would have significant effects on those accounting information sources, specifically the financial statements. Since analysts have been identified as one of the primary users of the financial statements and their investment recommendations have been linked to investor behavior, an exploration of the effects of changes in the financial statements on analysts' fundamental analysis was warranted. More specifically, this study answered the call by scholars in the field for further research into the effects of IFRS adoption in the U.S. The purpose of this study was to assess the effects of a transition to IFRS on the key financial indicators used by financial analysts in their analyses of publicly traded companies in the oil and gas production industry. The results highlight the variations in the two sets of standards that result in significant differences in the key financial indicators calculated under both methods and provide guidance for management's development of preparation efforts with regards to a transition to IFRS in the U.S.

INTRODUCTION

Globalization is changing the landscape of the investment world. Researchers agree that advances in technology, reductions in barriers to trade as a result of changing social policies, and global dispersion of production have transitioned capital markets from national and international to global (Cooper, 2008; Sovacool, 2010; Stulz, 2009; Travalini, 2009). This shift away from national capital markets to global capital markets has led to a movement towards a set of globally accepted accounting standards to increase transparency and comparability of financial statements. International Financial Reporting Standards (IFRS) are widely accepted as this global set of standards and are now used for public reporting purposes in more than 120 countries. While the momentum of the movement towards a transition to IFRS in the U.S. has weakened, the likelihood that the global standards will be implemented in some form or fashion in the coming years is still very high. In his opening remarks at the 2014 AICPA National Conference on Current SEC and PCAOB Developments, the Chief Accountant for the Securities and Exchange Commission (SEC) noted the SEC's focus on IFRS would continue to be a priority (SEC, 2014). He goes on to state, "As we focus our efforts on any potential paths forward, we are looking for feedback

regarding other alternatives that might or should be explored regarding any further incorporation of, or alignment with, IFRS for domestic issuers" (SEC, 2014). The objective of this study was to examine the transitory effects of a shift to IFRS on analysts' fundamental analyses and investment recommendations in the oil and gas production industry in U.S. Capital markets.

Since financial statements, and the annual report as a whole, are vitally important to the analysis of a company's financial strength and stability, a dramatic change in those statements, due to a change in the underlying standards, directly affects that analysis. More specifically, the financial indicators used in the fundamental analysis approach to equity valuation will be affected. Further, since analysts have been identified as one of the primary users of the financial statements and their investment recommendations have been linked to investor behavior, an exploration of the effects of changes in the financial statements on analysts' fundamental analysis is warranted.

The purpose of this study is to assess the effects of a transition to IFRS on the key financial indicators used by financial analysts in their analyses of publicly traded companies in the oil and gas production industry. Specifically, the research question being investigated is:

> What differences exist between key financial indicators used by analysts in the oil and gas production industry when the financial statements are prepared in accordance with U.S. GAAP compared to when the financial statements are prepared in accordance with IFRS?

The rationale for choosing the oil and gas production industry was twofold. First, a review of all industries that had foreign companies' whose stock was listed on at least one of the three major United States stock exchanges yielded nineteen possible industries to be used as a basis for this study. Of these nineteen, the industry that best represented the countries that recently adopted IFRS, or plans to in the near future, was the oil and gas production industry. Therefore, this industry served as a good focal point for this study. In addition, previous research has shown that limiting the scope of this type of research yields more generalizable results. For example, Rogers and Grant's (1997) sample primarily included manufacturing and retail companies. Nielsen (2008) focused her research on one industry, the health care industry. Abdolmohammadi, Simnett, Thibodeau, and Wright (2006) studied analyst reports for companies in only four industries. Further validating the use of this particular industry as the primary focus of this research, Vossen (2012) states, "Extractive industries, particularly oil and gas, would be significantly affected by the U.S. adoption of international accounting standards." He notes, "Although there is an IFRS standard on exploration and evaluation costs, there is otherwise limited industry specific guidance for oil and gas in IFRS" (Vossen, 2012).

This study builds on previous research (Abdolmohammadi et al., 2006; Breton & Taffler, 2001; Byers, 2012; Jones & Shoemaker, 1994; Nielsen, 2008; Previts et al., 1994; Rogers & Grant, 1997) that utilized content analysis of analyst reports as a means for investigating how analysts process accounting information and what specific information is considered fundamental to their analyses. More specifically, this study directly builds on Byers' (2012) research in which content analysis was used to identify the twenty-one most important key financial indicators used by analysts in the oil and gas production industry. Table 2 contains the list of these financial indicators, including a description and how each is calculated. Four of the twenty-one indicators were not applicable to this study and were removed. Additional explanation regarding the removal of these indicators is included in the Results section of this paper.

Further, this study extends the research into the effects of IFRS adoption in the U.S. (Hail, Leuz, & Wysocki, 2009; Henry, Lin, & Yang, 2009; Plumlee & Plumlee, 2008; Seay, 2014). The key financial indicators were investigated to assess the impact a transition to IFRS would have on the fundamental analysis of the companies in the industry. The indicators were calculated using both the U.S. GAAP financial statement and the IFRS financial statement for a series of years for numerous companies in the industry. The differences between the two amounts were examined.

The results revealed that 42% of the differences between the financial indicators calculated under the two sets of standards exceeded the predetermined threshold of 5 percentage points. More specifically, 11

of the 17 key financial indicators used in the study showed differences that were greater than 5% in more than one third of the cases examined. Further, 8 of these 11 indicators exhibited differences that exceeded this threshold in more than half of the cases investigated. This indicates that the two sets of standards were still very different during the sample years. Further investigation into those differences revealed that most remain unchanged through February of 2016. The data also revealed that some companies were affected more than others. As noted above, recent convergence projects have only minimally addressed the disparities identified between the two sets of standards related to this industry.

The remainder of this paper is organized as follows. The Literature Review provides an in depth review of the evolution of fundamental analysis research and the use of analyst reports as a means for investigating how analysts process accounting information when performing this analysis. The Research Design section focuses on the methodology that was employed, including sub-sections on sample selection and data collection. The empirical results of the study and the analyses of those results are presented in the Results section, while the Conclusion explains the implications of these results.

LITERATURE REVIEW

Market related accounting research was dominated by what is known as the information perspective for more than 20 years. The information perspective is an extension of one of the most significant developments in the theory of finance, that is, the Efficient Market Hypothesis (Bernstein, 1975). Fama (1970) suggested that an efficient market is one in which securities' market prices "fully reflect" all available information and are therefore a fair and accurate estimate of firm value (p. 383). Accordingly, stock price can serve as a benchmark that can be used to evaluate information, specifically accounting data. The information perspective holds that accounting data is relevant to equity valuation if, and only if, the figures have explanatory power, or information content, in reference to stock price (Penman, 1992). Further, any attempt to outperform the market by means of meticulous financial analysis is futile.

Researchers in the late 1980's and early 1990's began to shift from the long-established informational paradigm to what researchers have dubbed the measurement perspective to market related accounting research. The measurement perspective evolved from the critical distinction made by Bernstein (1975) between information, in and of itself, and the accurate, timely, and informed interpretation of that information. Bernstein (1975) suggested that security analysis is actually a vital part of an efficient market. The point of difference in the two perspectives then, for the purpose of this research, is that the information perspective holds that market price immediately reflects all available information, whereas the measurement perspective embraces the notion that market price may not reflect all information instantaneously but will slowly converge to the security's true value. Therefore, it can be beneficial to perform fundamental analysis in order to identify under or over-valued securities.

Fundamental analysis involves inferring a firm's intrinsic equity value by carefully examining accounting information such as earnings, risk, and growth in published financial reports, as well as assessing other sources of information concerning the firm's activities, the markets in which it competes, and the overall economic environment (Bauman, 1996; Graham, Dodd, & Cottle, 1963; Zhang & Yang, 2009).

Ou and Penman (1989) were among the first researchers to empirically test the validity of fundamental analysis (Bauman, 1996). Using a statistical approach known as a logit model, which is a regression model that measures the relationship between a categorical dependent variable and one or more independent variables by estimating probabilities using a logistic function, Ou and Penman identified a group of accounting fundamentals that could be combined into a single measure and used as an indicator of future earnings. A simulated trading strategy was followed and their results indicated that trading on value estimates that had been developed solely from financial statement data yielded a 14.5% return over a two year period. This research established a link between financial statement information and firm value, which is directly related to investment decisions.

Another study that represents a significant contribution to fundamental analysis research is that of Lev and Thiagarahan (1993). Unlike the statistical approach taken by Ou and Penman (1989), Lev and

Thiagarahan conducted a guided search of financial press literature and other analyst publications and identified twelve accounting fundamentals that appealed to the economic intuition behind fundamental financial statement analysis. The authors then tested the relevance of the twelve identified fundamental indicators to equity valuation. The results revealed that the fundamentals led to a significant improvement in the explanatory power of the traditional earnings model.

Building on Lev and Thiagarajan (1993), Abarbanell and Bushee's (1997) study of over 4,000 observations from 1983 to 1990 explored the predictive ability of the fundamentals to tie current financial data to future earnings. They examined the relationship between nine of Lev and Thiagarajan's fundamental signals and both the one-year-ahead earnings change and five-year earnings growth rate. The results indicated that relying on the specific fundamental signals when assessing future earnings is justified. This contributes to the current study in two ways. First, it serves as empirical evidence that fundamental analysis is a legitimate approach to firm valuation. In addition, it highlights the importance of key fundamental signals (indicators) in an accurate assessment of a security's value.

Financial analysts are the primary users of fundamental analysis. They use value-relevant fundamental signals when assessing a company's value. Vergoossen (1997) states, "analysts play an important role in the capital markets as information intermediaries between companies and investors" (p. 589). Previous research has revealed that analysts' recommendations are one of the most influential factors guiding investor behavior (Breton & Taffler, 2001; Krishnan & Booker, 2002; Womack, 1996). Analysts rely heavily on publicly traded companies' financial statements (i.e. the annual report), along with other information sources, to assess the financial position of a particular company. In fact, according to Schipper (1991), financial analysts are the primary users of the annual report. Regulatory changes that affect the preparation and disclosure of the annual report will affect the key financial indicators (fundamental signals) used by financial analysts in their analyses of publicly traded companies. One such regulatory change is the use of IFRS to prepare financial statements instead of national GAAP.

As noted above, a shift away from national capital markets to global capital markets has led to a movement towards a set of globally accepted accounting standards. International Financial Reporting Standards (IFRS) are rapidly becoming the popular option for this global set of standards, presently being used in over 120 countries. While the path that will be taken by the U.S. is still unclear, statements made in 2014 by persons representing the SEC seem to indicate that the U.S. is still on track to implement IFRS, in some form or fashion, in the coming years. In 2007, the U.S. eliminated the 20-F reconciliation filing requirement for foreign companies who prepare statements in accordance with IFRS. Generally, if a company wants to have their stock listed on a foreign exchange it must prepare their financial statements in accordance with local generally accepted accounting principles or provide a reconciliation that conforms to such (UNCTAD, 2009). Having one set of standards would eliminate this impeding rule globally, thereby facilitating the free flow of capital across geographical boundaries.

This study extends the current research on the differences between IFRS and U.S. GAAP and the transitory effects of a shift to IFRS (Bao, Lee, & Romeo, 2010; Henry et al., 2009; McEnroe & Sullivan, 2011; Seay, 2014). It builds on the Henry et al. (2009) study that investigated the progress of the convergence projects, attempting to harmonize U.S. GAAP and IFRS, between the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB). They examined 225 20-F reconciliations presented for the years 2004-2006 for 75 European Union companies. The results indicated that the average gap between U.S. GAAP and IFRS calculated net income and shareholders' equity declined from 2004 to 2006, consistent with the convergence efforts. However, the authors note that while declining, the differences remained significant. For example, they note that most firms in the study reported higher net income and lower shareholder's equity under IFRS than U.S. GAAP. The significance of the difference was revealed by examining the sample firms' Return on Equity (ROE) figures. As a result of the conversion, 28 percent of the sample firms' ROE calculated under IFRS was more than 5 percentage points higher than under U.S. GAAP. Further, less than 10 percent of sample firms' ROE was more than 5 percentage points lower. Contributing to the importance of this study, the authors noted that in light of the elimination of the reconciliation requirement and the potential adoption

of IFRS for U.S. companies, "investors and other financial statement users should be aware of the significant numerical differences" (p. 121).

McEnroe and Sullivan (2011) extended the aforementioned study by investigating the most significant adjustments reported on 2006 20-F Forms that reconciled between IFRS and U.S. GAAP and projecting whether those adjustments were likely to remain significant in the future. The results indicated that, "at a minimum, there should be more conformity in the areas of pensions and other post-retirement benefits, financial instruments, impairment, goodwill, and intangibles" (p. 130). As you will see, the results of the current study mirror these results.

It is important to note that the elimination of the reconciliation requirement in the U.S. in 2007 effectively eliminated the ability for investors and analysts to view the differences in the financial statements prepared under both sets of standards. Researchers have been forced to take one of two routes to study the differences between the standards and/or the transitory effects of a shift to IFRS. Some have chosen to use the data from 2007 and prior and supplement their findings with explorations into the related convergence projects and posit the likely effect on the results of their study (Bao et al., 2010; McEnroe & Sullivan, 2011). Others have used hypothetical data to measure the effects of transitioning based on analysis of the differences between the standards and suggesting the "most likely generic effect on the majority of U.S. firms" (Seay, 2014, p. 122). This study chose the former route, as it has provided the most thorough and empirically substantiated research. Therefore, the perceived limitations of this research, related to the use of 20-F reconciliations from several years ago, were mitigated by a thorough examination of how the recent convergence projects affect the empirical results.

The remainder of this article is organized as follows. First, the research design of this study is discussed below, including sections on sample selection, data collection, and the data analysis plan. Then, the results of the analysis are presented and are followed by the authors' conclusions.

RESEARCH DESIGN

The purpose of this study was to assess the effects of a transition to IFRS on the key financial indicators used by financial analysts in their analyses of publicly traded companies in the oil and gas production industry. To do so, numerous Form 20-F filings, which reconcile IFRS prepared financial statements to meet the guidelines required by U.S. GAAP, prepared by companies in the industry were examined. The key financial indicators were identified or calculated using both U.S. GAAP financial statements and IFRS financial statements for a series of years for numerous companies in the industry and the differences between the two amounts were examined.

Sample

The population of 20-F Filings from which the sample was chosen included all 20-F Filings for companies in the oil and gas production industry in the SEC Edgar database with reconciliations from IFRS to U.S. GAAP for 2004, 2005, 2006, and 2007 (the last year the filing was required). Any 20-F/A filings, which are amendments to the initial filing, were excluded from the population. In order to collect the sample, a list had to be compiled of all European Union, Australian, Swiss, Chinese, and South African companies whose stock was listed on a U.S. exchange (NASDAQ, Amex, NYSE) using the Bank of New York Mellon's depositary receipts website (http://www.adrbnymellon.com/home_dr.jsp). These countries were chosen because they recently adopted IFRS as their generally accepted accounting principles. A similar approach was taken in Henry, Lin, and Yang (2009); however, that study only included companies from the European Union. Using the Global Industry Classification Standard (GICS), which has been shown to be better than SIC or NAIC industry codes at explaining variations in financial metrics (Bhojraj, Lee, & Oler, 2003; Henry et al., 2009), a list was compiled of those companies in the oil and gas production industry.

Data Collection

The list of companies meeting the criteria included fifteen company names, as shown in Table 1.

TABLE 1
OIL AND GAS PRODUCTION COMPANY LIST

Company Name	Symb	Country
BP	BP	United Kingdom
China National Offshore Oil-CNOOC	CEO	China
China Petroleum & Chemical	SNP	China
Ecopetrol	EC	Colombia
Eni	E	Italy
Petrobras Energia	PZE	Argentina
PetroChina	PTR	China
Petroleo Brasileiro - Com	PBR	Brazil
Petroleo Brasileiro - Pref	PBR/	Brazil
Royal Dutch Shell - A Shares	RDS.	United Kingdom
Royal Dutch Shell - B Shares	RDS.	United Kingdom
Sasol	SSL	South Africa
Statoil	STO	Norway
TOTAL	TOT	France
YPF	YPF	Argentina

The filings for China National Offshore Oil-CNOOC, Petrobras Energia, Petroleo Brasileiro, Statoil, and YPF were eliminated from the analysis due to the fact that the 20-F filings for these companies showed reconciliations from various national GAAP, such as Hong Kong GAAP (for CEO) and Argentine GAAP (for PZE and YPF), and not from IFRS. All but one of the companies represented in the sample had a fiscal year end date of December 31st, and therefore, took advantage of the lifted requirement to reconcile and did not prepare the reconciliation for 2007. Sasol's fiscal year ends on June 30th of each year, and since it had prepared the 20-F filing prior to the SEC's announcement, it was able to be included in the study. As one can see in Table 1, two of the fifteen listed companies, Petroleo Brasileiro (PBR and PBR/A) and Royal Dutch Shell (RDS.A and RDS.B), are represented twice in the table. This is because both had two classes of stock. As noted above, PBR was eliminated from the analysis. In 2005, Royal Dutch Shell became the single 100% parent company of Royal Dutch Petroleum Company, a Dutch company, and of Shell Transport and Trading Company Limited, a United Kingdom company (Royal Dutch Shell plc, 2005). The "Unification transaction", as referred to in the annual report, resulted in one set of financial statements that reflect the two classes of shares (p. 6). This combined 20-F filing, for fiscal years ending in 2005 and 2006, was included in the sample.

The final sample to be analyzed consisted of nineteen 20-F filings. At this point in the study, all identifying fields, such as company name and company address, were eliminated. Each company year was numbered, resulting in a list starting with CY1 and ending with CY19.

Data Analysis

A list of the 21 financial indicators identified in Byers (2012), along with a description of the calculation of that indicator, was compiled, as shown in Table 2. In addition to the financial indicators, two other figures, *r* and *g*, had to be calculated due to the fact they were used in calculating two of the listed indicators, namely *DDM* and *DFCFM*.

TABLE 2
KEY FINANCIAL INDICATORS

Financial Indicator	Description	Description	Calculation	Financial Statement
share			# of shares outstanding	B/S
earnings			net income	I/S
capex		(capital expenditures)		B/S, I/S, SCF, notes
EPS		(earnings per share)	net income / # shares outstanding	I/S, B/S
return		(see below)		
	ROE	(return on equity)	net income / total stockholder's equity	I/S, B/S
	ROA	(return on assets)	net income / total assets	I/S, B/S
dividend			dividends paid / # of shares outstanding	B/S
EBIT		(earnings before interest and taxes)	net income - interest expense - income tax expense	I/S
EBITDA		(earnings before interest, taxes, deprecation, and amortization)	net income - interest expense - income tax expense - depreciation expense - amortization expense	I/S
DCF		(discounted cash flow models)		
	DDM	*(dividend discount model)	$V^o = D^o (1 + g) \div (r - g)$	I/S, B/S
	DFCFM	**(discounted free cash flow model)	$V_0 = \sum_{t=1}^{\infty} \frac{CF_t}{(1+r)^t}$	I/S, B/S
tax			income tax expense	I/S
sales			total sales revenue	I/S
expense			total expenses	I/S
asset			total assets	B/S
equity			total stockholder's equity	B/S
cash			total cash and cash equivalents	B/S
operating profit			Revenue - COGS - operating expenses	I/S
revenue			total revenue	I/S
FCF		(free cash flow)	net income - net capital expenditures - change in net working capital + new debt - debt payments	I/S, B/S
refining margin			refining revenues - expenses attributable to refining	I/S

Note. I/S = Income Statement; B/S = Balance Sheet; SCF = Statement of Cash Flows; Notes = Notes to the financial statements; V° = value of the stock in current year; D°= dividend paid in current year; g = expected constant growth rate; r = discount rate/required return rate; V° = value of the stock in period if t = 0; CFt = FCF in period t; r = WACC (weighted average cost of capital); t = time period

In this study, *r* was represented by the weighted average cost of capital (WACC) for the associated company year. If available, the average WACC referenced in analyst reports on the company during those years was used. If analyst reports for a particular company year did not contain WACC information, *r* was listed as *n*.

The expected constant growth rate to be used in the *DDM* calculation, *g*, was calculated as the average dividend growth rate from 2004 to 2007. Three growth rates were calculated for each of the seven companies represented in the sample—percentage growth from 2004 to 2005, percentage growth from 2005 to 2006, and percentage growth from 2006 to 2007. The average of the three growth rates was calculated and recorded in the spreadsheet to be used in the calculation of the aforementioned financial indicator.

The dividend discount model is based on the assumption that *r* is greater than *g*. The data revealed that *g* was greater than *r* for all 17 of the company years with values for *r*. Since the underlying assumptions of the model were not met, it was eliminated from the study.

The sample of 20-F reconciliations collected was then analyzed. This analysis yielded two amounts for each financial indicator for each company year – the metric calculated under U.S. GAAP and the metric calculated under IFRS. The final data set contained a scale dependent variable (the financial indicator) taken under two conditions (the independent variable—U.S. GAAP vs. IFRS), with the objective of this research being to assess the magnitude of the differences between these two numbers. This researcher hypothesized that the differences between the indicators calculated under the two sets of standards would be significant. The null hypothesis for each financial indicator being empirically tested was:

> *H^o: There is no difference between the mean [financial indicator] as calculated using the financial statements prepared in accordance with U.S. GAAP vs. the mean [financial indicator] as calculated using the financial statements prepared in accordance with IFRS.*

The alternative hypothesis for each financial indicator is:

> *H^a: There is a difference between the mean [financial indicator] as calculated using the financial statements prepared in accordance with U.S. GAAP vs. the mean [financial indicator] as calculated using the financial statements prepared in accordance with IFRS.*

Previous research reveals there are three primary measures of change generally used in many areas of research, which include the simple difference (SD = A – B) being used most frequently, percent change (PC = [(A – B) / B] x 100), and symmetrized percent change (SPC = [(A – B) / (A + B)] X 100) (Ankarali & Ankarali, 2009; Berry & Ayers, 2006; Kaiser, 1989; Istrate, 2013; and Vickers, 2001). Further, these researchers argue that the chosen measure of change to use in a study depends on the nature of the data and that one measure of change may be insufficient. Therefore, this research utilized two of the three primarily used measures of change, simple difference and percent change.

First, since the data included a scale variable taken under two conditions, a paired samples t-test was performed on the simple differences between the U.S. GAAP indicator and the IFRS indicator. This test assumes that the underlying data is normally distributed. Therefore, tests for normality were performed. Those metrics that had sufficient data for 30 or more company years were considered to be normally distributed. If the normality assumption was not met, the non-parametric equivalent to the paired samples t-test was performed, the Wilcoxon Signed-Rank test (Norušis, 2008).

Results for each financial indicator were presented in a chart. Those differences with a corresponding p-value of less than .05, the null hypothesis that there is no significant difference between the figures taken from the U.S. GAAP statements and the IFRS statements was rejected.

Next, as suggested by Ankarali and Ankarali (2009) and Istrate (2013), the percent change between the indicators calculated using U.S. GAAP and the indicators calculated using IFRS were analyzed. Percent change was calculated as (PC = (FI_ifrs – FI_us) / FI_us) where FI_ifrs represents the financial indicator calculated under IFRS and FI_us represents the financial indicator calculated under U.S. GAAP. In his 2013 study on the impact of IFRS on accounting data using the Gray Index of Conservatism, Istrate

(2013) substantiates the use of the U.S. figure in the denominator of the calculation by stating, "…they make up the starting point of our analysis in which we attempt to determine the distance between the IFRS and the former standards and not vice versa…" (p. 7). Henry, Lin, and Yang (2009) took a similar, yet different, approach and quantified differences between amounts reported under IFRS and U.S. GAAP using two scaling alternatives—IFRS book value and U.S. GAAP net income. Those researchers included in their results all percent changes exceeding 5 percentage points. Following this rationale, those percent differences calculated in this study exceeding five percentage points were investigated further to determine whether they were statistically significant. In addition, since some of the financial indicators were used in calculating other indicators (eg. total assets is the denominator of the ROA calculation), those differences relating to these component indicators that resulted in another indicator exceeding the threshold were also investigated. Specifically, for those financial indicators that were financial ratios, other ratios in the same category were to be examined to determine if the change was consistent. For example, if the current ratio had been 5 percentage points higher under IFRS than U.S. GAAP, other liquidity ratios were examined to determine if the magnitude of the differences were consistent across many of the liquidity measurements, in which case an evaluation of the potential impact of such differences on analyst's analyses, based on this researcher's sensitivity to and familiarity with such differences, was warranted and discussed. For those financial indicators that were not financial ratios, the analysis was to focus on the investigation into the causes of the differences between the figures as calculated in accordance with the two sets of standards.

RESULTS

As indicated in the data analysis plan, after the statistical analysis was completed, additional investigations into the causes of the differences reflected in the data were performed. The results of both analyses are presented below.

Data Results

Each financial indicator listed in Table 2 was located in, or calculated using information from within, the 20-F filing for each of the 19 company years if the appropriate information was available to do so. Of the 798 potential figures (21 financial indicators, calculated under two conditions (IFRS and U.S. GAAP), for each of the 19 company years), 603 were available to be calculated using the information provided in the 20-F filings.

A paired samples t-test is performed based on the assumption that the underlying data is normally distributed. Since the data set did not contain 30 or more company years, tests for normality were performed. *Capex, earng, roa, asset, ebit, ebitda, opprof, and fcf* appeared to be normally distributed, whereas, *eps, equity, roe, cash, exp, sales, tax, refmgn, and rev* did not. The Kolmogorov-Smirnov test and the Shapiro-Wilk test were run on those variables that did not appear to be normally distributed. All revealed a significance level (p-value) below 0.01, indicating that each did not meet the normality assumption for the paired samples t-test. Therefore, for those variables, the non-parametric equivalent, the Wilcoxon-Signed Ranks test, was performed.

First the paired samples t-tests were run on the variables that were normally distributed. The variables and their corresponding p-values are presented in Table 3.

Table 3 Normally Distributed Variables	
Variable	Sig (2-tailed)
capex	.170
earng	.326
roa	.615
asset	.733
ebit	.982
ebitda	.036
opprof	.820
fcf	.500

The results reveal that the null hypothesis, there is no difference between the mean [financial indicator] as calculated using the financial statements prepared in accordance with U.S. GAAP vs. the mean [financial indicator] as calculated using the financial statements prepared in accordance with IFRS, was able to be rejected for the *ebitda* variable. For all other variables listed in Table 5, there was insufficient evidence to reject the null hypothesis indicating that there is, in fact, statistical evidence that the two sets of standards yield different financial figures, thereby affecting the calculation of the key financial indicators used by analysts in the industry.

The Wilcoxon-Signed Ranks test was performed on those variables that did not meet the normality assumption. The variables and their corresponding p-values are presented in Table 4.

Table 4 Non-Normal Variables	
Variable	Sig (2-tailed)
eps	.327
equity	.841
roe	.872
cash	.273
exp	.157
sales	.012
tax	.480
refmgn	.650
rev	.008

The results indicate the null hypothesis can be rejected for the *sales* and *rev* variables. Therefore, based on the statistical testing, 14 of the 17 variables that were tested contained significant differences between the US GAAP version of the variable and the IFRS version of the variable.

After completing the paired samples t-test and the non-parametric equivalent to that test, as suggested by Ankarali and Ankarali (2009), the percent change (PC) between the financial indicators calculated using U.S. GAAP and the financial indicators calculated using IFRS was computed and analyzed. For each indicator a new variable was created and named *FI_pc* by dividing the simple difference (*FI_diff*) by the financial indicator prepared using U.S. GAAP (*FI_us*). For example, *capex_pc* was created using the following calculation: *capex_diff / capex_us*. Similar to Henry, Lin, and Yang (2009), the data analysis plan stated that all PCs exceeding 5 percentage points, or those that were used as a component in another indicator that exceeded the threshold, were to be investigated further. Of the 254 calculated PC figures, 107, or 42.13%, exceeded this level. Summary statistics are presented in Table 5.

Table 5 Percent Change Summary Statistics				
Variable	# of PCs calculated	# of PCs ≥ 5%	% of calculated PCs ≥ 5%	Average |PC|
refmgn_pc	2	2	100%	79.0%
roa_pc	19	16	84.2%	20.2%
fcf_pc	5	4	80.0%	39.6%
roe_pc	19	14	73.7%	36.1%
opprof_pc	16	10	62.5%	8.2%
ebit_pc	14	8	57.1%	10.7%
earng_pc	19	10	52.6%	13.2%
eps_pc	19	10	52.6%	13.0%
asset_pc	19	9	47.4%	13.7%
equity_pc	19	8	42.1%	21.8%
ebitda_pc	8	2	25.0%	9.5%
capex_pc	8	2	25.0%	8.7%
tax_pc	12	3	25.0%	7.8%
exp_pc	18	4	22.2%	18.2%
cash_pc	19	2	10.5%	13.5%
sales_pc	19	1	5.3%	7.6%
rev_pc	19	1	5.3%	7.5%

Table 5 shows all 17 variables, the number of PCs calculated for that variable, the number of company years that had a calculated PC greater than or equal to 5 percentage points for each variable, the percentage of the number of calculated differences that exceeded 5%, and the average PC for each variable using the absolute value of those changes since the direction of the deviation is not being assessed at this point. The results of this analysis show that *roa* and *roe* have the highest number of PCs exceeding 5%. Also, one can see that in 8 of the 17 variables, more than 50% of the calculated PCs exceeded the threshold. Further, more than 1/3 of the calculated PCs exceeded 5 percentage points in 11 of the 17 variables. This indicates that when the data was available, the PC was often times significant.

Investigative Results

The data analysis plan called for further investigation of those PCs that exceeded the predetermined level of five percentage points, as well as those used in calculating another variable associated with PCs above that threshold. The primary causes for the difference between the financial indicators calculated in accordance with IFRS and those calculated in accordance with U.S. GAAP discussed above included inconsistencies between the two sets of standards in accounting for: deferred tax assets and liabilities, Pensions and Post-Retirement Benefit Obligations (P&PRBO), provisions, financial instruments, business combinations, impairments, fair value accounting, inventory valuation estimates, borrowing costs, and successful efforts accounting. These inconsistencies were investigated further to determine if more recent convergence efforts have effectively eliminated these differences or if they remain relevant today. The results of the investigation into each of these categories are presented below.

Pensions & Post-Retirement Benefit Obligations

First, the differences surrounding accounting for P&PRBO were examined. The major differences regarding P&PRBO revolved around the recognition of actuarial gains and losses. IAS 19, *Employee Benefits*, states that all actuarial gains and losses should be recognized in the income statement (Pacter, 2015), whereas ASC 715, *Compensation-Retirement Benefits*, suggests they only be recognized in income when they exceed certain thresholds (FASB, ASC 715). Further, under U.S. GAAP, when a pension plan has an accumulated benefit obligation that exceeds the fair value of the plan assets, the unfunded amount

is required to be recognized as a minimum liability on the balance sheet. The offset to this liability is to be recorded as an intangible asset up to the amount of any unrecognized prior service cost or transitional liability, and thereafter directly in other comprehensive income. While IAS 19 requires the unfunded amount to be recognized as a liability, it does not have a similar concept regarding the recognition of the intangible asset. This remains unchanged to date.

Provisions

Next, provisions were investigated. The 20-F filings noted that under IFRS, provisions for decommissioning and environmental liabilities were estimated in accordance with IAS 37, *Provisions, Contingent Liabilities and Contingent Assets*, using costs based on current prices discounted to present values taking the time value of money into consideration (Pacter, 2015). In contrast, under U.S. GAAP, these are recognized in accordance with ASC 410, *Asset Retirement and Environmental Obligations* (FASB, ASC 410). In his comparison of the two sets of standards on contingencies and provisions, Stuart (2014) notes, "typically [under U.S. GAAP], a general loss contingency is not discounted unless the aggregate amount of the liability and the timing of the cash payments… are fixed or determinable." Even in such circumstance, the provisions are discounted using a credit-adjusted, risk-free rate to discount the estimated liabilities. This differs greatly from the IFRS rule, and presently, remains a point of difference between the two sets of standards.

Financial Instruments

Our investigation into the causes of the differences revealed that accounting for financial instruments was a point of deviation between the two standards. At the time, IAS 39, *Financial Instruments: Recognition and Measurement,* was the prevailing international standard that was followed. It required changes in the fair value of derivatives held for trading purposes and/or derivatives designated as fair value hedges be recognized in the income statement, thereby affecting earnings. Further, IAS 39 required that changes in the fair value of derivatives designated as cash flow hedges be recognized in equity via other comprehensive income. Amounts recorded in equity were to be transferred to the income statement when the hedged transaction affected profit or loss. Under US GAAP, all derivative financial instruments were (and presently are) accounted for under ASC 815, *Derivatives and Hedging,* and recorded on the balance sheet at their fair value (FASB, ASC 815). Similar to IAS 39, ASC 815 requires that changes in the fair value of derivatives be recorded each period in the income statement or other comprehensive income, depending on its classification. Differences existed if a particular derivative financial instrument was not designated as part of hedged transactions, thereby requiring all changes in fair value to be recognized in the income statement.

In July of 2014, after several joint deliberations between the FASB and the IASB, the IASB published the final version of IFRS 9, *Financial Instruments,* replacing IAS 39 (Pacter, 2015). On February 14, 2013, the FASB issued a proposed Accounting Standards Update, *Financial Instruments—Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities (FASB, ASU 825-10)*. At the November 2015 meeting, the Board requested permission to draft the final Update for vote by written ballot, indicating it is extremely close to adoption. Under both the FASB's proposed Update and the final version of IFRS 9, "an entity would classify and subsequently measure financial assets on the basis of the results of contractual cash flow characteristics and business model assessments" (FASB, *ASU 825-10*, p. 7). However, the application of the business model assessment could still result in differences in classification of the instruments. Further, IFRS 9 includes an option to recognize changes in the fair value of an equity security that is not held for trading in other comprehensive income, whereas the FASB's proposed update "would require all equity investments to be classified and measured at fair value through net income, with a practicability exception provided for measuring equity investments without readily determinable fair values" (p. 11). Therefore, the implications of the results of this study remain relevant today, as there are still differences between the two standards, as it relates to this item.

Business Combinations, Inventory Valuation, Fair Value for PP&E

Another cause of the exceedingly large PCs identified in some of the 20-F Filings was related to the differences in the rules for accounting for business combinations between the two sets of standards. Under U.S. GAAP, the acquisitions of two companies did not qualify as pooling-of-interests, as they did under IFRS, and therefore, were accounted for as purchases resulting in differences in accounting for the equity investments, goodwill, and PP&E revaluations of the consolidated companies. The joint project for business combinations was completed in 2008, thereby aligning IFRS 3, *Business Combinations,* with ASC 805, *Business Combinations* (FASB, 2011a). While this can be seen as a positive step on the road to convergence, it should be noted that only 2 of the 19 company years had differences related to accounting for business combinations. Therefore, the implications of this study are still significant due to the fact that this is one of the only investigated differences that has since been rectified as a result of convergence efforts.

Further investigation into differences related to inventory valuations revealed that the last-in-first-out (LIFO) method of valuation of crude oil, petroleum products, and natural gas inventories was used. The LIFO inventory valuation method is allowed under U.S. GAAP but not under IFRS. This represents a large hurdle on the path to convergence that remains today.

Some differences were largely attributable to the revaluation and subsequent disposal of PP&E. Under ASC 360, *Property, Plant, and Equipment*, PP&E is recorded at historical cost and revaluation to fair value is not allowed (FASB, ASC 360. However, under IAS 16, *Property, Plant, and Equipment,* it is. While the FASB completed the Fair Value Measurement joint project on May 12, 2011, with the issuance of Accounting Standards Update No. 2011-04, *Fair Value Measurement (Topic 820): Amendments to Achieve Common Fair Value Measurement and Disclosure Requirements in U.S. GAAP and IFRSs, the disallowance of revaluation of PP&E under U.S. GAAP remains unchanged (FASB, 2011b).*

Impairment, Borrowing Costs, Successful Efforts Accounting

Impairments and their impact on the indicators under the two sets of standards were also examined. U.S. GAAP required that the carrying value of PP&E and goodwill be compared with undiscounted future cash flows to determine if an impairment loss is present. Under IFRS, discounted future cash flows are used. The notes to the financial statements of several of the companies revealed that some of the impairment charges recognized under IFRS would not have been recognized using U.S. GAAP. To date, there have been no significant updates to the standards relating to the impairment of tangible long lived assets. Because the standards are so similar on the issue (undiscounted vs discounted) the convergence project was not given priority. Impairment for goodwill, on the other hand, has seen developments. On September 15, 2011, the FASB completed the related project with the issuance of Accounting Standards Update No. 2011-08, *Intangibles–Goodwill and Other (Topic 350): Testing Goodwill for Impairment* (FASB, 2011c). However, differences still remain between ASC 350 and IAS 36, *Impairment of Assets.*

For CY16 only, the capitalization of borrowing costs caused a difference in earnings and total assets. Under IAS 23, *Borrowing Costs*, an entity "determines the amount of borrowing costs eligible for capitalization as the actual borrowing costs incurred on that borrowing during the period less any investment income on the temporary investment of those borrowings" (Grant Thornton, 2015, p. 7). Under ASC 835-20, *Capitalization of Interest,* interest received on the temporary investment of funds is not permitted to be offset against interest expense in calculating the interest capitalization rate (FASB, 2013). Therefore, under U.S. GAAP, the amount of interest capitalized to qualifying assets exceeded the amount capitalized under IFRS. This difference remains unchanged. While it only affected one company year in the study, it still represents a point of difference between the two standards and, therefore, further validates the significance of this research.

The notes to the financial statements presented in the 20-F filings referenced the difference in accounting for costs associated with the development and operation of exploratory wells as another point of difference between the two standards. Under IFRS 6, exploration costs, including successful exploratory wells, were expensed when incurred. Under U.S. GAAP, costs relating to exploratory wells

are initially capitalized as *incomplete wells and other* until it is deemed a successful effort (i.e., commercial quantities of reserves were discovered). This initial capitalization gave rise to differences in the earnings calculation under the two methods. There have been no convergence efforts to eliminate this difference to date.

Deferred Tax Assets and Liabilities.

The investigation into deferred tax assets and liabilities revealed that the primary components of deferred taxation attributable to the differences between the financial figures taken under the two sets of standards were related to the other reconciling items discussed above including P&PRBO, provisions, and financial instruments. As noted, those differences remain and therefore, the related deferred tax assets and liabilities remain as well.

CONLUSIONS

While the momentum of the movement towards a transition to IFRS in the U.S. has weakened, the likelihood that the global standards will be implemented in some form or fashion in the coming years is still very high. The purpose of this study was to assess the effects of a transition to IFRS on the key financial indicators used by financial analysts in their analyses of publicly traded companies in the oil and gas production industry. The results of this study add to the body of knowledge and contribute to a better understanding of the consequences that a transition to IFRS would have on the oil and gas production industry. Specifically, this research uncovered that there are still significant differences between the two sets of standards that result in substantial variations in the key financial indicators that financial analysts use when making investment recommendations in the oil and gas production industry.

The study sought to answer the question, "What differences exist between the identified financial indicators when the financial statements are prepared in accordance with U.S. GAAP compared to when the financial statements are prepared in accordance with IFRS?" First, the results revealed that in 107 of the 254 comparisons, or 42.13%, the numbers differed by more than 5 percentage points. Further, 8 of the 17 key financial indicators that analysts use when making investment recommendations were greater than 5% different in over 50% of the cases. This number jumps to 11 of 17 if examining the data for those variables with more than one third of the calculated differences exceeding 5%. This indicates that the two sets of standards were still very different during those years. Further investigation into those differences revealed that most remain unchanged to date. These differences will have direct effects on the fundamental analyses of these companies, thereby affecting analysts' investment recommendations.

The data also revealed that some companies were affected more than others. For instance, one company was associated with most of the largest PCs in a number of variables because it was one of the only companies that had to account for IFRS's disallowance of the LIFO inventory valuation method. This helps to illustrate the fact that a transition to IFRS will impact companies very differently. Where one company may only have minimal differences in the financial figures used in fundamental analysis as a basis for investment decisions, others may see extremely large deviations. This variation in the potential impact of a transition is only magnified when considering companies from other industries. Based on the results, it would behoove the FASB and the SEC to make significant efforts to harmonize the two sets of standards prior to moving forward with a transition. More specifically, the areas that had the greatest effect on the key financial indicators in the oil and gas industry that remain relevantly different, in terms of their effect on investment decisions, that need substantial harmonization are pension and post-retirement benefits, deferred tax assets and liabilities, , provisions, financial instruments, business combinations, impairments, fair value accounting, inventory valuation estimates, borrowing costs, and successful efforts accounting.

The results of this study are important for practitioners, as well, in that they provide some guidance for management in preparation for a transition to IFRS. More specifically, it directs where to focus investor and analyst education and which topics warrant thorough explanations in their annual reports. Companies preparing for a transition should include more detailed information on the differences between

the aforementioned figures under the two sets of standards since they were identified as significant to analysts' analyses of companies in this industry.

LIMITATIONS

It is important to note that the elimination of the reconciliation requirement in the U.S. in 2007 effectively eliminated the ability for investors and analysts to view the differences in the financial statements prepared under both sets of standards. Researchers have been forced to use the data from 2007 and prior and supplement their findings with explorations into the related convergence projects and posit the likely effect on the results of their study (Bao et al., 2010; McEnroe & Sullivan, 2011). The researcher in this study took great care to provide the most thorough and empirically substantiated results. Therefore, the perceived limitations of this research, related to the use of out-dated 20-F reconciliations, were mitigated by a thorough examination of how the recent convergence projects affected the empirical results. As noted above, these projects have only minimally addressed the disparities between the two sets of standards related to this industry.

And, while IFRS 1, *First-time Adoption of International Financial Reporting Standards,* which requires companies to retrospectively apply the international standards to all periods presented as if they had always been in effect, would be extremely helpful for analysts when comparing company results for the current period to previous periods, it is not universally applied or required. The IASB recognizes there are certain situations in which the cost of a full retrospective application of IFRS would exceed the potential benefit to investors and other users of the financial statements, and therefore, IFRS 1 contains a number of voluntary exemptions and mandatory exceptions to the requirement. Therefore, the significance of the differences identified in this study remains. Further, in the event a company does in fact prepare this retrospective application, this does not help resolve the issue related to comparability of the financial information to a U.S. company in the same industry.

RECOMMENDATION FOR FUTURE RESEARCH

Scholars and practitioners in the oil and gas production industry would benefit from continued investigations of the convergence efforts and their impact on the financial statements and the users of those statements. Also, being that there is very limited research on possible adoption of IFRS, other industries would benefit from studies exploring the potential impacts of such a transition. In addition, future research that builds on the results of this study is recommended. Potential topics might include an investigation into the evolution of investors' and analysts' understanding of the key financial indicators used in this study with regards to the impact of a transition. For example, a study in the year of, or year after, conversion that examines how analysts account for the changes in these indicators and how the transition actually affects their investment recommendations.

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