

Accounting Statement Footnotes Contextual Association with Firm Financial Characteristics in the Oil and Gas Industry

Zane Swanson
University of Central Oklahoma

Azam Habibi
University of Central Oklahoma

This study investigates the association of the annual report readability with the firm's weighted average cost of capital (WACC), which is a key ratio used in readers' decision-making and firm valuations. This study extends readability research in financial ratio, footnote, and management discussion and analysis (MD&A) areas. Findings indicate that WACC associates with the accounting readability of MD&A and footnotes. The study focuses upon the oil and gas industry in order to analyze "successful efforts" versus "full cost" accounting methods. The study finds the annual report readability is significant in regards to accounting choice of "successful efforts" versus "full cost".

INTRODUCTION

The corporate information environment is an endogenous framework (Beyer et al 2010) including financial statements and footnotes. The proposition that financial statement information can be only understood in the context of the footnotes, then prompts the research question: What are the footnote contextual effects (uncertainty, readability, etc.) on a firm's financial characteristics? For example, how does one know the value of inventory if one does not know the accounting method (e.g. first-in first-out)? In general terms, this study addresses the contextual value of firm financial statement information, which is a long-standing issue with important consequences (Akerlof 1970). In this study's footnote analyses, the focus is upon WACC as a firm characteristic because it is a key determinant within and outside the firm for investor and management decisions. Investors use WACC to do business valuations, and management use WACC as a discount factor in project investment decisions (Easton et. al 2015). These factors are articulated in a specific research question: What is the association between the WACC and the readability of its related footnote information? The study findings indicate that higher (better) MD&A readability associates inversely with WACC. In other words, in the presence of higher uncertainty (e.g., readability difficulty) investors are likely to assign with higher risk (e.g., WACC) to a firm.

No prior study directly examines the relation between readability of financial statements and cost of capital in the oil and gas industry, which is one reason for investigating it. Furthermore, the study analyzes the oil and gas industry because of its particular accounting method treatment of "successful efforts" (SE) and "full cost" (FC) accounting. This accounting choice is of interest because of its controversial history (Collins et al 1982, Cortese et al 2009) and the investment implications. Thus, it does represent an opportunity to investigate an industry case situation that may have general

ramifications. Here, empirical findings indicate a readability index association with a specific accounting policy.

The study organization is as follows. Section II is a literature review. Section III has the research design with hypotheses and Section IV has the empirical framework. Section V presents the results. The final section contains the conclusions.

LITERATURE REVIEW

There are three sections to the literature review relevant to this study. The first one addresses the readability of annual reports. The second covers WACC. The final section discusses FC and SE choice in the oil and gas industry.

Readability

The literature review summarizes current readability research as it applies to accounting. This area is evolving with no present consensus and attracting continuing research interest. In the accounting field, Li (2008) finds that firms with lower (higher) earnings are more difficult (easier) to read according to the Fog readability index. From a general perspective, Lehavy et al (2011) report that an annual report's readability is associated with informativeness in analyst forecasts. Loughran and McDonald (2013) find that the size of 10K filings is comparable if not superior in some respects to a readability measure, the Fog Index. These studies suggest that firm risk associates inversely with the readability of annual reports. The current study uses MD&A size, but employs the Flesch index for specific footnote areas of equity, debt and tax. Loughran and McDonald (2013) also test the Flesch index. Differently from prior works, the current study investigates footnotes details in order to explore the context and not just the content of annual reports. Footnotes are written in the context of accounting issues utilizing specific terminology and therefore the general approach of the Flesch index is best suited for the current research.

WACC

The literature review covers three lines of research with respect to WACC: the relation of information asymmetry and cost of capital, the disclosure effect upon the cost of equity and industry research with regards to the accounting choice of FC versus SE. Considerable research has empirically analyzed WACC Ohlson and Pagano (2014). No research resolution about the models that would explain WACC has reached consensus. The reason for the continued research and lack of consensus is the criticism (e.g. Fama and French 1999) that the WACC model is difficult to define. The current research examines one version of the WACC model and focuses upon its association with footnote information in order to facilitate the perspective upon WACC. See the following WACC description (Copeland and Weston 1988) in equation (1) for this study's model. Note, the terms are utilized later in empirical regression equation formulations.

$$WACC = k_d (1 - \tau_c) \times (B / (B + S)) + k_e \times (S / (B + S)) \quad (1)$$

Where

WACC = Weighted average cost of capital

k_d = cost of debt,

τ_c = tax rate,

B = market value of debt,

S = market value of equity, and

k_e = cost of equity.

Cost of equity is a component of WACC. The association of disclosure and cost of equity capital is the subject of a considerable stream of accounting research (e.g., Botosan 1997). Botosan and Plumlee (2002) find an inverse relation of the cost of equity with a disclosure measure (i.e., Association for

Investment Management and Research score). Francis et. al (2004), Francis et. al (2005), Espinosa and Trombetta (2007) find that higher quality disclosures (as evidenced by accruals) do associate with lower cost of equity. As equity and debt are different stakeholder vehicles and both are components of WACC, the logical conclusion is that easier readability (that is better disclosure) should associate with lower WACC.

FC and SE Choice

First, let's review FC and SE as to the accounting choice purpose and implications. In the oil and gas industry, preproduction costs can vary according to the accounting choice method for acquisition, retention, exploration and development. "Under the successful efforts method, exploratory dry holes and geological and geophysical exploration costs are charged against earnings during the periods in which they occur; whereas, under the full cost method of accounting, such costs and expenses are capitalized as assets, pooled with the costs of successful wells and charged against the earnings of future periods as a component of depletion expense" (Pioneer Natural Resources 10K 2009). Thus, the choice can have differential effects upon earnings and equity. Initial research (Collins et. al 1982) indicates that FC reporting gives superior return results over SE. Subsequent research (Barniv and Suwardjono 2000) find the earnings accuracy predictions of FC is higher than SE in the oil and gas industry. In addition, they report that earnings response coefficients (ERCs) are higher for firms using FC as opposed to SE. A later investigation by Boone and Raman (2007) does not find opportunistic reporting differences between FC and SE firms. Cortese et al. (2009) report that the FC method results in higher earnings. Gray (2015) finds that investors appear to consider different factors about investing in FC versus SE firms. The current research analyzes whether FC has a differential impact to SE, in the context of footnotes, with respect to the WACC.

RESEARCH DESIGN

Given that financial statements are only meaningful in the context of the footnotes, what is the contextual effect association with firm financials? Investors in the debt and equity markets determine WACC market components. The investors should be making their decisions based upon firm financial statement information and footnotes. Firm tax policy affects the effective tax rate applicable to interest expenses and this after-tax choice impacts WACC. With regards to the research question, a resultant hypothesis is:

H1a: Higher disclosure quality associates with a lower WACC.

The current study focuses on the oil and gas industry with respect to its importance and unique characteristics. In particular, these firms make a policy choice between "successful efforts" (SE) and "full cost" (FC) accounting. In order to address this firm accounting decision, the following hypothesis is posed:

H2a: Policy choice of SE versus FC is relevant to oil and gas industry WACC and footnote readability.

EMPIRICAL FRAMEWORK

The sample comes from the oil and gas industry (SIC 1311, 1381, 1382 and 1389) 2012 10K filers from 2014. The sample excludes service firms because they have no reserves and therefore do not make the SE versus FC accounting policy choice. If the adjusted tax rate is greater than one, the observation is eliminated because a firm's taxes reflect unusual activity. The weighted average cost of capital is computed using a Research Insight EXCEL macro. Note that an additional adjustment to the macro is necessary when preferred stock is an applicable component.

There is a complex contextual relation between annual report text information and financial characteristics. Thus, we use a regression system of two equations. The reasoning is that the financial statement numerical data and text information will be interdependent and therefore a simultaneous equation system is appropriate (e.g. Lobo and Zhou 2001). In order to be robust, the study addresses the interaction with MD&A in the premier phase and then does a sensitivity analysis with the accounting policy footnote. Also for completeness, we analyze the system in an additive (traditional WACC) form and a multiplicative (WACC Cobb-Douglas elasticity) formulation.

MD&A Interaction Analyses

For the initial phase, the premise of the first equation (see equation 2) is that the weighted accounting average cost of capital is the sum of its parts (Easton et al 2015) and that financial preparers will provide readable MD&A information so as to minimize WACC. The second equation (see equation 3) posits that the MD&A readability is a function of WACC plus footnote readability characteristics. These propositions are represented as follows by the system of equations (2) and (3).

$$WAAC = A_0 + A_1 Ke + A_2 Drate + A_3 Drate*Trate + A_4 Lmda + \text{error} \quad (2)$$

$$Lmda = B_0 + B_1 Fequity + B_2 Fdebt + B_3 Ftax + B_4 KeFn + B_5 DrateFn + B_6 TrateFn + B_7 WAAC + \text{error} \quad (3)$$

Where

WACC = debt / (debt+equity) * (1- Tax Rate)* Debt Rate + equity / (debt+equity) * Equity Rate and a preferred stock component if applicable,

Ke = cost of equity (from CAPM),

Drate = interest rate on debt,

Trate = 1-effective tax rate,

fdebt = Debt Footnote Flesch Easy Reading Formula Low(High) is hard(easy),

fequity = Equity Footnote Flesch Easy Reading Formula Low(High) is hard(easy),

ftax = Tax Footnote Flesch Easy Reading Formula Low(High) is hard(easy),

DrateFn = interaction of Drate times fdebt,

KeFn = interaction of Ke times fequity,

TrateFn = interaction of trate times ftax,

Lmda = log (size of MDA in bytes), and

A₀ , B₀ = intercepts.

Robustness is important in empirical studies and as previously mentioned we incorporate an elasticity analysis approach (i.e., Cobb-Douglas function). A transformation of equation (2) is made in equation (4) where the log is taken of dependent and independent variables. Note, that the debt/tax interaction term is dropped in the log formulation because it would create a linear combination situation. Equations (3) and (4) are run as a regression system. Equation (4) follows:

$$LWAAC = C_0 + C_1 Lke + C_2 Ldrate + C_3 Ltrate + C_4 Lmda + \text{error} \quad (4)$$

Where

C₀ = intercept.

Accounting Policy Interaction Analyses

Because the analysis is complex with potential interactions, we do a sensitivity analysis of substituting accounting policy footnote readability for the MD&A variable. As in the aforementioned design, there is a system of two equations. The first part of the research model addresses the premise that firm management / financial statement preparers will act to minimize the weighted accounting average

cost of capital (WACC) with respect to their components and the accounting policy footnote readability. The second part of the research model is that the accounting policy footnote readability will be a function of applicable footnote characteristics and WACC. The regression systems are similar to equations (2), (3) and (4) are labeled with an (a) as follows:

$$Fpolicy = A_0 + A_1 Ke + A_2 Drate + A_3 Drate*Trate + A_4 Lmda + error \quad (2a)$$

$$Lmda = B_0 + B_1 Fequity + B_2 Fdebt + B_3 Ftax + B_4 Kefn + B_5 DrateFn + B_6 TrateFn + B_7 Fpolicy + error \quad (3a)$$

$$LWAAC = C_0 + C_1 Lke + C_2 Ldrate + C_3 Ltrate + C_4 Fpolicy + error \quad (4a)$$

Where

Fpolicy = Accounting Policy Footnote Flesch Easy Reading Formula Low(High) is hard(easy)

Full Cost VS Successful Efforts

In order to investigate the impact of “full cost” versus “successful efforts”, two research design approaches are utilized. One uses the previously discussed regression system approach. In that methodology, because we demonstrate that a no-intercept version of system is valid, we only consider it and include an accounting choice indicator variable. In the second approach, a logistic regression investigates the impact of footnote and WACC information on accounting method choice of “successful efforts” versus “full cost”. Equation (5) is the logistic regression as follows.

$$Choice = D_0 + D_1 Fpolicy + D_2 Fequity + D_3 Fdebt + D_4 Ftax + D_5 Kefn + D_6 Dratefn + D_7 Taxfn + D_8 Lmda + D_9 Wacc + D_{10} Ke + D_{11} Drate + D_{12} Trate + error. \quad (5)$$

Where

D₀ = intercept.

EMPIRICAL FINDINGS

Descriptive statistics are in Table 1. The sample contained 60 SE firms and 20 FC firms from 2014. The means and standard deviations seem reasonable and no extreme observations appear present. Correlation information is in Table 2 and is consistent with face value logic.

TABLE 1
DESCRIPTIVE STATISTICS OF 80 OBSERVATIONS

FMDA is MD&A size. Fequity is equity footnote Flesch score. Fdebt is debt footnote Flesch score. Ftax is tax footnote Flesch score. Wacc is weighted average cost of capital. Ke is the cost of equity. Drate is the cost of debt. Trate is 1 minus the effective tax rate.

| Variable | Mean | Std. Dev. | Minimum | Maximum |
|----------|--------|-----------|---------|---------|
| FMDA | 98.263 | 49.368 | 30.000 | 230.000 |
| Fequity | 35.163 | 8.103 | 13.530 | 58.650 |
| Fdebt | 31.049 | 8.442 | 16.360 | 63.200 |
| Ftax | 26.717 | 5.302 | 8.600 | 36.590 |
| Wacc | 0.078 | 0.018 | 0.042 | 0.142 |
| Ke | 0.087 | 0.012 | 0.060 | 0.122 |
| Drate | 0.062 | 0.046 | 0.000 | 0.250 |
| Trate | 0.718 | 0.197 | 0.026 | 1.000 |

TABLE 2
SIMPLE PEARSON CORRELATIONS

Fequity is equity footnote Flesch score. Fdebt is debt footnote Flesch score. Ftax is tax footnote Flesch score. Wacc is weighted average cost of capital. Ke is the cost of equity. Drate is the cost of debt. Trate is 1 minus the effective tax rate. KeFn is Ke times Fequity. DrateFn is Drate times Fdebt. TrateFn is Trate times Ftax.

| Variable | Wacc | Ke | Drate | Trate | KeFn | DrateFn |
|----------|-------|-------|-------|-------|------|---------|
| Ke | 0.44* | | | | | |
| Drate | 0.49* | 0.22& | | | | |
| Trate | 0.47* | 0.08 | 0.18 | | | |
| KeFn | 0.35* | 0.45* | 0.16 | 0.10 | | |
| DrateFn | 0.47* | 0.08 | 0.95* | 0.18 | 0.14 | |
| TrateFn | 0.51* | 0.18 | 0.23# | 0.85* | 0.18 | 0.21& |

* signifies a t-statistic ($\alpha=.01$), # signifies a t-statistic ($\alpha=.05$), and & signifies a t-statistic ($\alpha=.10$)

MD&A Findings

Table 3 has base case results of additive and multiplicative logged regressions. The equity, debt and tax variables do associate with WACC. The debt footnote variable shows a significant (at conventional levels) relation with the MD&A dependent variable. The coefficient is negative which suggests a substitution effect where debt information is presented. In the multiplicative model, LWACC has positive association with LMD&A which supports a rejection of hypothesis 1.

TABLE 3
BASIC SYSTEM REGRESSION

Fequity is equity footnote Flesch score. Fdebt is debt footnote Flesch score. Ftax is tax footnote Flesch score. Wacc is weighted average cost of capital. Ke is the cost of equity. Drate is the cost of debt. Trate is 1 minus the effective tax rate. KeFn is Ke times Fequity. DrateFn is Drate times Fdebt. TrateFn is Trate times Ftax. Fpolicy is accounting policy footnote Flesch score. L is logged.

| Original (80 Obs.) | | | | Log Transformation (71 Obs.) | | | |
|---------------------|-----------------|-----------|-----------------|------------------------------|------------------|-----------|-----------------|
| | Eq. (2) Wacc | | Eq. (3) Lmda | | Eq. (4) LWacc | | Eq. (3) Lmda |
| Intercept | 0.0332# | Intercept | 5.2233* | Intercept | -0.6243& | Intercept | 7.2526* |
| Ke | 0.6178* | Fequity | -0.0170 | Lke | 0.5793* | Fequity | 0.0138 |
| Drate | -0.3760* | Fdebt | -0.0178# | Ldrate | 0.1690* | Fdebt | -0.0258* |
| Trate | -0.0009 | Ftax | 0.0037 | Ltrate | 0.3473* | Ftax | 0.0154 |
| DrateTrate | 0.6501* | KeFn | 0.2220 | | | KeFn | -0.0692 |
| Lmda | -0.0032 | DrateFn | 0.0541 | Lmda | 0.0144 | DrateFn | -0.0516 |
| | | TrateFn | -0.0158 | | | TrateFn | -0.0337# |
| | | Wacc | -2.2471 | | | LWacc | 0.7186& |
| Adj. R ² | .5808 | | .0983 | | .5058 | | .1404 |

* signifies a t-statistic ($\alpha=.01$), # signifies a t-statistic ($\alpha=.05$), and & signifies a t-statistic ($\alpha=.10$)

The Table 4 has the no-intercept case (i.e. as in equation 1). The WACC components are significant at conventional levels which validates the WACC framework. In regards to hypothesis 1, the additive model results indicate a rejection because the readability variable has a negative result at conventional levels for the MD&A variable. Without the intercept, in the multiplicative model the sign is negative which suggests a diminishing return impact. There also does appear to be significant associations between the readability of footnotes (e.g., equity) and the MD&A.

TABLE 4
NO INTERCEPT REGRESSION

Fequity is equity footnote Flesch score. Fdebt is debt footnote Flesch score. Ftax is tax footnote Flesch score. Wacc is weighted average cost of capital. Ke is the cost of equity. Drate is the cost of debt. Trate is 1 minus the effective tax rate. KeFn is Ke times Fequity. DrateFn is Drate times Fdebt. TrateFn is Trate times Ftax. Fpolicy is accounting policy footnote Flesch score. L is logged.

| Original (80 Obs.) | | | | Log Transformation (71 Obs.) | | | |
|---------------------|-----------------|---------|-----------------|------------------------------|------------------|---------|-----------------|
| | Eq. (2) Wacc | | Eq. (3) Lmda | | Eq. (4) LWacc | | Eq. (3) Lmda |
| Ke | 0.7143* | Fequity | 0.0424& | Lke | 0.7570* | Fequity | -0.0339& |
| Drate | -0.3307* | Fdebt | -0.0025 | Ldrate | 0.1770* | Fdebt | -0.0066 |
| Trate | 0.0088 | Ftax | 0.1072* | Ltrate | 0.3368* | Ftax | 0.0037 |
| DrateTrate | 0.5797* | KeFn | -0.1113 | | | KeFn | 0.5575* |
| Lmda | 0.0008 | DrateFn | -0.0549 | Lmda | -0.0230 | DrateFn | 0.0899 |
| | | TrateFn | -0.0659* | | | TrateFn | 0.0031 |
| | | Wacc | 23.3677* | | | LWacc | -1.4965* |
| Adj. R ² | .9776 | | .9675 | | .9963 | | .9847 |

* signifies a t-statistic ($\alpha=.01$), # signifies a t-statistic ($\alpha=.05$), and & signifies a t-statistic ($\alpha=.10$)
Rsquare is defined as 1 - (Residual Sum of Squares/Uncorrected Total Sum of Squares).

Financial Policy Footnote Sensitivity/Robustness

For purposes of robustness, the system regressions are run with accounting policy footnote readability (as measured by the Flesch metric) replacing the previous model's log of the MD&A variable. Tables 5 and 6 have results similar to Tables 3 and 4. The additive model (equations 2a and 3a) findings support the rejection of hypothesis 1 for the no-intercept case in table 6, but not with the intercept in table 5.

TABLE 5
SENSITIVITY ANALYSIS BASIC SYSTEM REGRESSION

Equity is equity footnote Flesch score. Fdebt is debt footnote Flesch score. Ftax is tax footnote Flesch score. Wacc is weighted average cost of capital. Ke is the cost of equity. Drate is the cost of debt. Trate is 1 minus the effective tax rate. KeFn is Ke times Fequity. DrateFn is Drate times Fdebt. TrateFn is Trate times Ftax. Fpolicy is accounting policy footnote Flesch score. L is logged.

| Original (79 Obs.) | | | | Log Transformation (71 Obs.) | | | |
|---------------------|------------------|-----------|---------------------|------------------------------|-------------------|-----------|---------------------|
| | Eq. (2a) Wacc | | Eq. (3a) Fpolicy | | Eq. (4a) LWacc | | Eq. (3a) Fpolicy |
| Intercept | 0.0119 | Intercept | 17.5590* | Intercept | -0.6353& | Intercept | 25.0743* |
| Ke | 0.6084* | Fequity | 0.1633& | Lke | 0.6148* | Fequity | 0.1409 |
| Drate | -0.3762# | Fdebt | 0.0595 | Ldrate | 0.1675* | Fdebt | 0.0578 |
| Trate | -0.0001 | Ftax | -0.1303 | Ltrate | 0.3210* | Ftax | -0.1726 |
| DrateTrate | 0.6445* | KeFn | -1.3262 | | | KeFn | -1.2818 |
| Fpolicy | 0.0004 | DrateFn | -0.2189 | Fpolicy | 0.0069 | DrateFn | -0.0063 |
| | | TrateFn | 0.1417& | | | TrateFn | 0.1515 |
| | | Wacc | 25.9761 | | | LWacc | 1.7135 |
| Adj. R ² | .5765 | | .0911 | | .5144 | | .0637 |

* signifies a t-statistic ($\alpha=.01$), # signifies a t-statistic ($\alpha=.05$), and & signifies a t-statistic ($\alpha=.10$)
Rsquare is defined as 1 - (Residual Sum of Squares/Uncorrected Total Sum of Squares).

TABLE 6
SENSITIVITY ANALYSIS NO INTERCEPT REGRESSION

Fequity is equity footnote Flesch score. Fdebt is debt footnote Flesch score. Ftax is tax footnote Flesch score. Wacc is weighted average cost of capital. Ke is the cost of equity. Drate is the cost of debt. Trate is 1 minus the effective tax rate. KeFn is Ke times Fequity. DrateFn is Drate times Fdebt. TrateFn is Trate times Ftax. Fpolicy is accounting policy footnote Flesch score. L is logged.

| Original (79 Obs.) | | | | Log Transformation (71 Obs.) | | | |
|---------------------|------------------|---------|---------------------|------------------------------|-------------------|---------|---------------------|
| | Eq. (2a) Wacc | | Eq. (3a) Fpolicy | | Eq. (4a) LWacc | | Eq. (3a) Fpolicy |
| Ke | 0.6598* | Fequity | 0.3631* | Lke | 0.8347* | Fequity | -0.0240 |
| Drate | -0.3380# | Fdebt | 0.1112# | Ldrate | 0.1768* | Fdebt | 0.1242& |
| Trate | 0.0024 | Ftax | 0.2177# | Ltrate | 0.3404* | Ftax | -0.2130& |
| DrateTrate | 0.5955* | KeFn | -2.4464# | | | KeFn | 0.8852 |
| Fpolicy | 0.0006# | DrateFn | -0.5852& | Fpolicy | 0.0040 | DrateFn | 0.4830 |
| | | TrateFn | -0.0269 | | | TrateFn | 0.2784* |
| | | Wacc | 112.0849* | | | Wacc | -5.9447* |
| Adj. R ² | .9786 | | .9714 | | .9961 | | .9764 |

* signifies a t-statistic ($\alpha=.01$), # signifies a t-statistic ($\alpha=.05$), and & signifies a t-statistic ($\alpha=.10$)
Rsquare is defined as 1 - (Residual Sum of Squares/Uncorrected Total Sum of Squares).

Successful Efforts VS. Full Cost Findings

Tables 7 and 8 presents the regression system equation analyses about the accounting choice variable of successful efforts (SE) equal one and full cost (FC) equal zero. Generally, the variables are significant in a similar manner to the previously presented no-intercept results in Tables 4 and 6. In basic design of Table 7, the accounting choice variable is significant which indicates the MD&A size (readability) is influenced by it in the additive model. None of the other models exhibit significance for the accounting choice variable.

TABLE 7
ACCOUNTING CHOICE NO INTERCEPT REGRESSION

Fequity is equity footnote Flesch score. Fdebt is debt footnote Flesch score. Ftax is tax footnote Flesch score. Wacc is weighted average cost of capital. Ke is the cost of equity. Drate is the cost of debt. Trate is 1 minus the effective tax rate. KeFn is Ke times Fequity. DrateFn is Drate times Fdebt. TrateFn is Trate times Ftax. Fpolicy is accounting policy footnote Flesch score. L is logged. Choice is 1 if “successful efforts” and 0 if “full cost”.

| Original (80 Obs.) | | | | Log Transformation (71 Obs.) | | | |
|---------------------|------------------|---------|------------------|------------------------------|-------------------|---------|------------------|
| | Eq. (2a) Wacc | | Eq. (3a) Lmda | | Eq. (4a) LWacc | | Eq. (3a) Lmda |
| Choice | -0.0048 | Choice | 0.5506* | Choice | -0.0379 | Choice | 0.1670 |
| Ke | 0.7162* | Fequity | 0.0360& | Lke | 0.7543* | Fequity | -0.0347& |
| Drate | -0.3262# | Fdebt | -0.0010 | Ldrate | 0.1757* | Fdebt | -0.0048 |
| Trate | 0.0084 | Ftax | 0.0859* | Ltrate | 0.3233* | Ftax | 0.0006 |
| DrateTrate | 0.5730* | KeFn | -0.0532 | | | KeFn | 0.5605* |
| Lmda | 0.0012 | DrateFn | -0.0365 | Lmda | -0.0199 | DrateFn | 0.0900 |
| | | TrateFn | -0.0487# | | | TrateFn | 0.0063 |
| | | Wacc | 20.8047* | | | LWacc | -1.4415* |
| Adj. R ² | .9774 | | .9702 | | .9960 | | .9847 |

* signifies a t-statistic ($\alpha=.01$), # signifies a t-statistic ($\alpha=.05$), and & signifies a t-statistic ($\alpha=.10$)
Rsquare is defined as 1 - (Residual Sum of Squares/Uncorrected Total Sum of Squares).

TABLE 8
SENSITIVITY ANALYSIS ACCOUNTING CHOICE NO INTERCEPT REGRESSION

Fequity is equity footnote Flesch score. Fdebt is debt footnote Flesch score. Ftax is tax footnote Flesch score. Wacc is weighted average cost of capital. Ke is the cost of equity. Drate is the cost of debt. Trate is 1 minus the effective tax rate. KeFn is Ke times Fequity. DrateFn is Drate times Fdebt. TrateFn is Trate times Ftax. Fpolicy is accounting policy footnote Flesch score. L is logged. Choice is 1 if “successful efforts” and 0 if “full cost”.

| | Original (80 Obs.) | | | Log Transformation (71 Obs.) | | | |
|---------------------|--------------------|---------|--------------------|------------------------------|------------------|---------|--------------------|
| | Eq. (2) Wacc | | Eq. (3) Fpolicy | | Eq. (4) LWacc | | Eq. (3) Fpolicy |
| Choice | -0.0022 | Choice | 1.3487 | Choice | -0.0400 | Choice | 0.4455 |
| Ke | 0.6711* | Fequity | 0.3474* | Lke | 0.8244* | Fequity | -0.0261 |
| Drate | -0.3252* | Fdebt | 0.1149# | Ldrate | 0.1755* | Fdebt | 0.1290& |
| Trate | 0.0023 | Ftax | 0.1655 | Ltrate | 0.3248* | Ftax | -0.2212& |
| DrateTrate | 0.5784* | KeFn | -2.3043& | | | KeFn | 0.8932 |
| Fpolicy | 0.0009# | DrateFn | -0.5402& | Fpolicy | 0.0038 | DrateFn | 0.4832 |
| | | TrateFn | 0.0152 | | | TrateFn | 0.2873* |
| | | Wacc | 105.8072* | | | LWacc | -5.7980* |
| Adj. R ² | .9784 | | .9718 | | .9960 | | .9761 |

* signifies a t-statistic ($\alpha=.01$), # signifies a t-statistic ($\alpha=.05$), and & signifies a t-statistic ($\alpha=.10$)
Rsquare is defined as 1 - (Residual Sum of Squares/Uncorrected Total Sum of Squares).

A logistic regression (e.g., equation 5) is performed on the accounting choice variable of SE and FC. See Table 9. The 75 percent result is good in comparison with a 50 random chance. Specifically, the tax variables are significant in a similar fashion to the previously discussed regression system results.

TABLE 9
LOGISTIC REGRESSION OF ACCOUNTING POLICY FC / SE CHOICE

Dependent variable is accounting choice (1 is Successful Efforts and 0 is Full Cost). Fequity is equity footnote Flesch score. Fdebt is debt footnote Flesch score. Ftax is tax footnote Flesch score. Wacc is weighted average cost of capital. Ke is the cost of equity. Drate is the cost of debt. Trate is 1 minus the effective tax rate. KefN is Ke times Fequity. DrateFn is Drate times Fdebt. TrateFn is Trate times Ftax. Fpolicy is accounting policy footnote Flesch score.

| Parameter | Estimate | Wald ChiSq | Pr>ChiSq |
|-----------|-----------|---------------|----------|
| Intercept | 13.7188 | 1.1644 | 0.2805 |
| Fpolicy | 0.0338 | 0.1186 | 0.7305 |
| Fequity | -0.5629 | 2.5545 | 0.1100 |
| Fdebt | -0.0291 | 0.3178 | 0.5730 |
| Ftax | -0.5548 | 3.2651 | 0.0708 |
| KefN | 7.0018 | 2.5908 | 0.1075 |
| DratefN | 1.8342 | 3.7096 | 0.0541 |
| TaxfN | 0.7438 | 3.0695 | 0.0798 |
| Lmda | -0.3759 | 0.3201 | 0.5715 |
| Wacc | 5.0338 | 0.0390 | 0.8434 |
| Ke | -227.1000 | 2.1429 | 0.1432 |
| Drate | -57.8670 | 3.5502 | 0.0595 |
| Trate | 18.1993 | 2.4539 | 0.1172 |

Association of Predicted Probabilities and Observed Responses

| | | | |
|--------------------|------|-----------|-------|
| Percent Concordant | 75.3 | Somers' D | 0.508 |
| Percent Discordant | 24.5 | Gamma | 0.509 |
| Percent Tied | 0.3 | Tau-a | 0.193 |
| Pairs | 1200 | C | 0.754 |

CONCLUSIONS

This research study investigates the association of MD&A and financial statement readability with the WACC firm characteristics. The findings are an expansion of the knowledge about the linkage between written and numerical firm report data. The results support the contention that higher readability of firm information will enable investors to make better choices for the greater good of the economy. Evidence indicates that FC / SE accounting choice does matter in the oil and gas industry. The firm tax characteristics appear to be most important in regards to that accounting policy choice. An obvious limitation of any statistical significance is the relatively small sample from one industry. Future research might expand the sample.

This study has a limitation in its general application because it only covers a single year sample. Additional analyses were performed for following year 2015 of the sample firms. This year was a difficult one for the oil and gas industry because of the drop in prices. As of this writing, only one half of the prior year's sample size is accessible for a variety of reasons including firms delisting and/or going out of business. Therefore, this data is not included in the study tables due to the change in economic circumstances. Statistical analyses were conducted and this 2015 data does speak to significance across the board of tax and debt variables, but not much else.

REFERENCES

- Akerlof, G. (1970), 'The Market for 'Lemons': Quality Uncertainty and the Market Mechanism', *Quarterly Journal of Economics* pp. 488-500.
- Barniv, R. and NLN, Suwardjono. (2000) Alternative Accounting Procedures, Forecast Accuracy, and Value-Relevance of Earnings in the Oil and Gas Industry. Available at SSRN: <http://ssrn.com/abstract=230492>
- Barth, M. Y. Konchitchki, and W. Landsman. (2013) "Cost of capital and earnings transparency" *Journal of Accounting and Economics* V55 (2-3) 206-224.
- Beyer, A., D. Cohen, T. Lys and B. Walther. (2010), "The financial reporting environment: Review of the recent literature." *Journal of Accounting and Economics* V50 (2-3) 296-343.
- Boone, J. and K. Raman. (2007) "Does Implementation Guidance Affect Opportunistic Reporting and Value Relevance of Earnings?" *Journal of Accounting and Public Policy*, V26 (2) 160-192.
- Botosan, C. (1997). "Disclosure level and the cost of equity capital." *The Accounting Review* 72, 323–349.
- Botosan, C. and M. Plumlee. (2002). "A Re-examination of Disclosure Level and the Expected Cost of Equity Capital." *Journal of Accounting Research* 40, 21–40.
- Collins, D., M. Rozeff, and W. Salatka. (1982) "The SEC's Rejection of SFAS No. 19: Tests of Market Price Reversal." *The Accounting Review* V57 (1) 1-17.
- Copeland, T. and F. Weston. (1988) *Financial Theory and Corporate Policy*, Third Edition. Addison-Wesley Publishing.
- Cortese, C., Irvine, H., and M. Kaidonis. (2009). Extractive industries accounting and economic consequences: Past, present, and future, *Accounting Forum*, 33(1), 27-37.
- Easton, McAnally, Sommers, and Zhang. (2015) *Financial Statement Analysis & Valuation*, Fourth Edition. Cambridge Business Publishers.
- Esponosa, M. and M. Trombetta. (2007) "Disclosure Interactions and the Cost of Equity Capital: Evidence From the Spanish Continuous Market." *Journal of Business Finance & Accounting* 34(9) & (10) 1371–1392.
- Fama, E.F., and K. French. (1999) "The corporate cost of capital and the return on corporate investment." *Journal of Finance* 54 1939-1967.
- Fischer P. and R. Verrecchia (2000) 'Reporting Bias', *Accounting Review*, 229-245.
- Francis, J., R. Lafond, P. Olsson and K. Schipper (2004) "Costs of Equity and Earnings Attributes." *The Accounting Review*, 79, 967-1010.
- Francis, J., R. Lafond, P. Olsson, and K. Schipper (2005) "The Market Pricing of Accruals Quality," *Journal of Accounting and Economics*, 38, 295-327
- Francis, J., Nanda, D. and P. Olsson. (2008) "Voluntary disclosure, earnings quality, and cost of capital". *Journal of Accounting Research* 46, 53–99.
- Gray, C. (2015) *Market Impact of Proved Reserve Disclosures by U.S. Publicly Held Oil and Gas Exploration and Development Companies* Dissertation Northcentral University.
- Lehavy, R., F. Li and K. Merkley. (2011) "The Effect of Annual Report Readability on Analyst Following and the Properties of Their Earnings Forecasts" *The Accounting Review* V 86 N 3 1087-1115.
- Li, F. (2008) "Annual report readability, current earnings, and earnings persistence" *Journal of Accounting and Economics* V 45 221-247.
- Gerald J. Lobo, and Jian Zhou. (2001) "Disclosure quality and earnings management." *Asia-Pacific Journal of Accounting and Economics* V8 (1): 1-20.
- Loughran T. and B. McDonald. (2014). "Measuring Readability in Financial Disclosures" *Journal of Finance* V69 (4) 1643-1671.
- Olson G. and M. Pagano. (2014) "The Empirical Average Cost of Capital" Available at SSRN: <http://ssrn.com/abstract=348800>

Pioneer Natural Resources 10K. (Feb 25, 2009).

http://www.wikinvest.com/stock/Pioneer_Natural_Resources_Company_%28PXD%29/Successful_Efforts_Method_Accounting

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.