



Salient accounting value drivers and equity returns : Evidence from US industries

Omar Camara *

Department of Accounting and Finance, College of Business Administration (COBA),
Prince Mohammad Bin Fahd University, Kingdom of Saudi Arabia
*Corresponding author E-mail: ocamara@pmu.edu.sa

Abstract

Past literatures suggest the presence of ubiquitous disquiet among corporate financial managers, financial analysts and portfolio managers that changes in certain accounting variable's results in changes in stock prices, irrespective of whether future cash flow's subsume these changes in salient accounting variables. Using an empirical rational inquiry, this paper attempts to test whether there is any relationship between salient accounting variables and equity returns for five major US industries (Manufacturing, Services, Wholesale, Constructions and Retail) from the period 1996 to 2015, and as a result, may contribute to accretion or loss in stockholders' wealth. To account for divergent industry-specific revenue generating process and the existing fluidity in industry-specific application of accounting standards, this study thus disaggregates sample data by industry. The industry approach implies that the effect of salient accounting variables on equity prices may be described as a conflation of industry-specific characteristics and capital market synergies. Consistent with this notion, this study finds that salient accounting variables which are used to measure operating performance, growth opportunities, investment management and profitability have the significant impact on equity returns. However, and most importantly, the study finds that the impact of the salient accounting variables varies from one industry to another. As such, this study is particularly useful for equity market participants in the identification of industry related, market-relevant accounting variables, which may be used to guide future financial policies.

Keywords: Capital Markets; Financial Accounting; Equity Returns; Us Industries; Panel Data.

1. Introduction

Corporate managers' ability to affect stock prices depends on the efficiency level of the capital markets. Both efficient market hypothesis (EMH) and the alternative hypothesis of profit-fixed market participants assumed that only unanticipated reported earnings or major corporate events may have the impact on equity prices. These propositions accord credence to technical analysts and skepticism towards the efforts of fundamental analysts. However, in this paper, both signaling and disclosure theories are embraced, given the fact that financial statements are manifestations of both theories. Signaling theory is the concept that one party credibly conveys some information about itself to another party, while disclosure shares the same interpretation, except that signaling under certain circumstances may be quite obscured. Thus, in this paper, the relationships between salient accounting variables and equity returns are examined from a purely-neutral empirical perspective, without making presumptions about efficient market argument or lack thereof. Specifically, this study uses certain key variables from financial statements that in prior literature are believed to have influence on firms' equity value. The salient accounting variables are drawn from operating, investing and financing components of firms' statements of financial condition. It is expected that appropriate policy orientations in these three areas may not only increase profitability and growth, but it may also increase shareholder wealth through an increase in equity prices. In addition, the industry-approach in this paper is expected to

make the contribution to the literature in identifying the accounting value drivers of share prices within the context of industry-specific characteristics such as divergent revenue recognition mechanisms, tangibility and growth opportunities. In other words, the importance of a specific accounting variable may depend on the structure within the industry, for example, manufacturing and construction industries are relatively highly capital intensive than other industries. Similarly, industries differ in their earnings generating process, particularly for manufacturing and construction industries, where a percentage-of-completion-method of earnings recognition is preferred. The aforementioned industry-specific concerns render it necessary to disaggregate data by industry in order to examine which accounting variables are crucial for respective industries in relation to equity price mutation. The findings of this study may facilitate corporate financial managers in identifying and optimizing accounting value drivers, shareholders in recognizing accounting value drivers of their investments and portfolio managers in their diversification efforts.

The rest of the paper is organized as follows: section 2 reviews literature related to accounting factors that influence equity prices. The data generating process and methodology are presented in section 3. Section 4 discusses the findings of the empirical tests, and section 5 concludes the paper.

2. Literature

Financial accounting data has a function of facilitating investors' risk assessments. Liu and Liu (2007) defined value-relevance as “

the ability of accounting numbers to summarize the information underlying the stock prices, thus the value relevance is indicated by a statistical association between financial information and stock prices or returns." Justification for using accounting data to explain market value is both theoretical (e.g. Miller and Modigliani, 1961) and empirical (e.g. Easton and Harris, 1991). Another theoretical perspective on the market-accounting value relationship is provided by Penman (1992), who also argued for a "return to fundamentals." Survey and behavioral research provided additional evidence that analysts find accounting values useful in making assessments about firm market values (Barker, 1999). The extant literature provided evidence that capital market participants use firms' accounting information to analyze investment risk and that there is a strong relationship between equity price volatility and earnings volatility (Beaver et al., 1980, Ray, 1995). Scott (2003) suggested that accounting data has value if it transmit information that modifies investor's expectation of firms' future cash flows, and subsequently triggers changes in equity valuation. The capital market literature can be divided into three distinct groups. The first group assumed that investors are sophisticated and the market itself is efficient (i.e. efficient market hypothesis). Thus only unanticipated events in the probability distribution of expected future cash flows influence market valuations (Fama, 1976; Tinic, 1990). The assumption of the second group is that of a capital market environment with unsophisticated investors (i.e. naive investor hypothesis), and thus share prices are primarily driven by the announcement of reported earnings (Kothari, 2001; Hand, 1990). As reported by Kothari (2001), the impact of financial statement data on capital markets is an enduring and well documented area of research. The third group adopts a functional fixation hypothesis, which, in essence, is a mixed of the first two groups (Watts and Zimmerman, 1986; Belkoui, 1992).

Irrespective of the hypotheses, much prior empirical evidence shows financial accounting data has influence on equity prices (Watts and Zimmerman, 1986; Dhaliwal, 1986; Dukes, 1976; Lev and Sougiannis, 1996; Aboody and Lev, 1998, Christie, 2010, and Cheng and Yang, 2003). In their seminal paper, Ball & Brown (1968) established the claim that annual earnings announcements convey information to the stock markets in the developed countries. After they empirically studied the correlation between annual report earnings data and stock price, they found that a company had excess earnings, and investors can get abnormal return. In their study of the relationship between accounting values and equity return, Harris and Ohlson (1987) show that equity returns are influenced by the book values of gas and oil industry. Similar findings on the relationship between accounting information and equity prices were documented throughout the literature (Kothari, 2001; Hopkins et al., 2000; Luft and Shields, 2000; Richardson & Tinaikar, 2004; Hirschey et al., 2001; Aaker and Jacobson, 2001; Graham et al., 2005; Al-Harbi, 2003; Liang and Yao, 2005; Junttila et al., 2005; Tan and Lim 2007).

Furthermore, Chandra and Ro (2008) provided evidence of value relevance of earnings and revenues on equity prices, while Burgstahler and Dichev (1997) suggested that the relationship between earnings and stock prices is rather convex.

In another study, Garcia-Ayuso and Rueda (1999) using accounting data of Spanish companies, provided evidence of differential marginal explanatory power of earnings and book values in explaining equity prices. Consistent with the findings of Garcia-Ayuso et al. (1998), Negakis (2005) also suggested a differential impact of earnings and book values on stock prices.

At an industry level, a number of prior studies have provided evidence that the impact of earnings and book values on stock prices varies in different industries (Hughes, 2000; Boone, 2002; and Riley et al., 2003).

3. Data and methodology

All firm data are collected from Annual Compustat and CRSP database from 1996 to 2015, and the industry classifications (SIC

codes) for the five major US industries (Manufacturing, Services, Wholesale, Constructions and Retail) are obtained from US Department of Labour classifications. In order to enhance the reliability of the estimated values, firm level variables were trimmed at the upper and lower 1%, firms with less than ten (10) years of data are excluded from this study. This yields a total of 6,806, 2,839, 1,515, 18,798, and 642 observations for Services, Retail, Wholesale, Manufacturing, and Construction respectively. Consistent with prior research, equity return (R), financial leverage (FLEV), return on sales (ROS), asset turnover (AT), current ratio (CR), return on assets (ROA), operating working capital turnover (OWCT), inventory turnover (IT), market to book ratio (MV/BV) variables is used in equations 1 and 2. Tests in the capital market setting employ both a stock returns model (e.g., Vincent 1999) and a levels (price) model (Kothari and Zimmerman 1995; Francis and Schipper 1999). The former is used in this paper in an effort to investigate the effects of salient accounting disclosures on equity returns, thus the following definition of stock return is developed.

$$R_{it} = \ln \left(\frac{P_{it}}{P_{i,t-1}} \right) \quad (1)$$

Where R_{it} is the annual returns at time t for firm i , and P_{it} is the share price on the last trading day of year t for firm i , $P_{i,t-1}$ is the share price on the last trading day of the previous year $t-1$ for firm i .

The information content of salient accounting variables on the stock return is therefore estimated:

$$R_{it} = \alpha_0 + FLEV_{it}\beta_1 + ROS_{it}\beta_2 + AT_{it}\beta_3 + CR_{it}\beta_4 + ROA_{it}\beta_5 + OWCT_{it}\beta_6 + IT_{it}\beta_7 + (MV / BV)_{it}\beta_8 + \varepsilon_{it} \quad (2)$$

4. Empirical findings

Tables 1a – 1d highlights descriptive statistics of the five (5) industries and salient accounting variable. Table 1c reports the t-test matrix of log returns among the industries as well as a remarkably low correlation between the variables in table 1d. The empirical results from the model (2) are reported in table 2 for the entire sample period and in table 3, 2008, data were excluded to account to the effect of financial crisis of 2008. The results of pooled data in both tables 2 and 3 shows that six (6) out of eight (8) salient accounting variables have the statistically significant effect on equity returns. Although the return on assets (ROA) varies from industry to industry, it is consistently positively statistically significant on equity return for all five industries in both table 2 and 3. Such consistencies of the importance of return on assets (ROA) across all five (5) industries are in line with the findings from prior studies (Scott Pirie and Malcolm Smith, 2008, and Christie, 2010). The intensity of the impact of return on assets (ROA) on equity return is more evident for construction, wholesale and retail industries in both table 2 and 3. In contrast to the implications of return on assets (ROA) on equity return, financial leverage (FLEV) shows no effect on equity return across all five industries in both table 2 and 3. A possible reason for no impact of an increase in financial leverage on equity return is that the ratio did not disaggregate long-term debt from other liabilities. Corporate finance theory suggests that equity prices should rise if the return on investments exceeds the cost of long-term borrowing. Therefore, due to the accounting noise embedded in financial leverage, the effect on equity price may not be easily predictable. Similar to financial leverage, inventory turnover (IT) exhibit no effect on equity prices. In both tables 2 and 3, return on sales (ROS) shows significant negative association with equity prices for manufacturing, services and wholesale and statistically insignificant association with construction and retail industries. Investors rely on return on sales (ROS) because it almost precisely communicates the

portion of operating cash a firm actually makes on its revenue and may provide intuition into potential dividends. Since dividend announcements and payments generally tend to have inverse relationship with equity prices, the results of negative association between return on sales and equity prices in tables 2 and 3 are expected. The empirical results for current ratio (CR) and operating working capital turnover (OWCT) in both tables 2 and 3 are not convincing for all five industries. The short term nature and

dynamics of CR and OWCT may not be proof essential for long-term equity valuation. Finally, the impacts of market to book value (MV/BV) on equity return in both tables 2 and 3 are strikingly similar, with construction and wholesale been the two affected industries. This empirical examination shows that when data is not pooled, but disaggregated by industry, accounting variables tend to exhibit differential effect on equity prices.

Table 1a: Descriptive Statistics - Salient Accounting Value Drivers, Log Return, and Market Value: Variables are Winterized at 1% (I.E. Trimmed Mean)

Pooled	# of Obs.	Mean	Std. Dev	Min	Max
MValue	32444	4681.35	21703.38	.00	647506.90
Log Return	32264	-.02	.54	-1.92	1.65
FLEV	32247	2.55	71.97	-9032.20	4593.52
ROS	31769	-6.36	220.76	-29319	609.07
AT	32238	1.18	.93	-.39	20.78
CR	31328	3.25	5.54	0	664
ROA	32237	-.06	.48	-27.58	10.18
OWCT	31315	5.69	355.74	-35289.13	33430.67
IT	26205	25.37	508.94	0	66511
MV/BV	32239	3.45	57.09	-4027.24	7426.01
Services	# of Obs.	Mean	Std. Dev	Min	Max
MValue	7184	4186.58	23185.9	.07	596475.8
Log Return	7188	-.03	.56	-1.92	1.64
FLEV	7187	2.84	128.28	-9032.2	4593.52
ROS	7151	-3.83	142.06	-8684	609.07
AT	7181	1.06	.86	-.39	15.96
CR	6822	2.52	3.55	.02	116.08
ROA	7181	-.05	.47	-12.33	10.18
OWCT	6817	7.31	270.13	-5051	18293.44
IT	3089	70.42	351.29	.06	13801
MV/BV	7184	3.84	33.22	-996.93	1371.57
Retail	# of Obs.	Mean	Std. Dev	Min	Max
MValue	2991	6290.79	22028.41	.93	318344.20
Log Return	2993	.02	.51	-1.91	1.59
FLEV	2991	2.99	18.09	-198.93	573.95
ROS	2990	.03	.14	-2.55	5.06
AT	2990	1.96	.86	0	8.61
CR	2966	1.92	1.36	.13	17.26
ROA	2990	.05	.11	-1.82	.53
OWCT	2965	-.97	394.86	-13935	7556.56
IT	2968	21.29	34.23	.53	274.60
MV/BV	2991	3.88	29.54	-144.15	1404.03
Wholesale	# of Obs.	Mean	Std. Dev	Min	Max
MValue	1594	1877.36	4184.87	.00	48158.56
Log Return	1599	.00	.48	-1.92	1.61
FLEV	1593	2.73	18.03	-416.20	529.79
ROS	1589	-.25	7.25	-280.95	3.63
AT	1593	2.54	2.02	-.02	20.78
CR	1566	2.51	2.36	0	58.25
ROA	1593	.03	.14	-2.91	.41
OWCT	1565	8.98	117.13	-2102.08	2619.94
IT	1536	29.70	193.57	.09	5292.45
MV/BV	1591	2.25	6.29	-101.52	120.65
Manufacturing	# of Obs.	Mean	Std. Dev	Min	Max
MValue	19800	4951.92	22263.56	.04	647506.9
Log Return	19807	-.03	.54	-1.92	1.65
FLEV	19801	2.37	48.86	-2555.42	4565.58
ROS	19365	-9.01	269.21	-29319	369.11
AT	19800	.99	.63	-.03	7.14
CR	19589	3.79	6.56	.02	664
ROA	19799	-.08	.53	-27.58	2.55
OWCT	19584	5.83	390.19	-35289.13	33430.67
IT	17974	18.15	593.71	0	66511
MV/BV	19798	3.40	69.07	-4027.24	7426.01
Construction	# of Obs.	Mean	Std. Dev	Min	Max
MValue	675	1501.72	2233.55	1.82	12949.81
Log Return	677	-.01	.52	-1.84	1.65
FLEV	675	2.45	3.67	-50.21	42.31
ROS	674	-.03	.31	-5.14	.47
AT	674	1.39	.70	.02	3.73
CR	385	2.18	1.77	.17	15.30
ROA	674	.00	.14	-.81	.31
OWCT	384	7.58	17.58	-87.46	224.82
IT	638	19.29	61.19	0	946.40
MV/BV	675	1.65	1.33	-10.30	10.05

Table 1b: Descriptive Statistics: Log Return (Excluding 2008 Data)

	# of obs.	Mean	Std. Dev.
Pooled	30600	.014	.516
Services	6806	.010	.534
Retail	2839	.056	.479
Wholesale	1515	.031	.458
Manufacturing	18798	.010	.520
Construction	642	.025	.499

Table 1c: T-Test Matrix: Log Return (Excluding 2008 Data). P-Values in Brackets. *, **, *** Denotes 1%, 5%, and 10% Significance Respectively

Industry	Services	Retail	Wholesale	Manufacturing	Construction
Services		5.08 (0.000)*	1.81 (0.035)*	-.571 (0.284)	0.755(0.225)
Retail	5.08 (0.000)*		-2.1(0.018)**	-12.7 (0.000)*	-1.5 (0.05)***
Wholesale	1.81 (0.035)*	-2.1(0.018)**		-12.7 (0.000)*	-1.9 (0.06)***
Manufacturing	-.571 (0.284)	-12.7(0.000)*	-12.7 (0.000)*		-1.5 (0.05)***
Construction	0.755(0.225)	-1.5(0.05)***	-1.9 (0.06)***	-1.5 (0.05)***	

Table 1d: Correlation Matrix

Variables	MV	LogReturn	FL	ROS	AT	CR	ROA	OWCT	IT	MV/BV
LogReturn	.03	1.0								
FLEV	.00	.00	1.0							
ROS	.01	.01	.00	1.0						
AT	-.05	.03	-.00	.04	1.0					
CR	-.09	-.01	-.02	-.02	-.23	1.0				
ROA	.08	.17	.00	.11	.13	-.00	1.0			
OWCT	.01	.01	.00	.00	.01	-.01	.00	1.0		
IT	-.01	-.00	.01	-.01	.00	.01	-.03	-.00	1.0	
MV/BV	.01	.01	.74	.01	-.00	-.00	.01	.00	.01	1.0

Table 2: Regression Results (Model 2) Using Least Squares Dummy Variable (LSDV): The Table Reports Coefficients of Variables and the T-Statistic in Brackets. *, **, ***, Denotes 1%, 5% and 10% Significance Respectively

Variables	Pooled	Construction	Manufacturing	Services	Wholesale	Retail
Constant	.015 (.80)	-.202 (.171)	.025 (1.12)	-.13(-2.3)**	.020 (.29)	.015 (.28)
FLEV	-.00 (-1.3)	.002 (.16)	-.000 (-0.68)	-.00 (-.29)	-.001 (-1.43)	-.000 (-.81)
ROS	-.00 (-2.23)**	-.038 (-.10)	-0.000 (-1.74)***	-.0(-2.2)**	-.162 (-4.0)*	-.051 (-.41)
AT	.012 (3.7)*	.004 (.13)	.016 (2.69)*	.015 (1.03)	.011 (2.0)**	.011 (1.18)
CR	-.002 (-2.1)**	-.002 (-.16)	-.003 (-2.43)**	-.001 (-.26)	.001 (.11)	-.010 (-1.0)
ROA	.261 (28.74)*	.882 (2.56)**	.254 (24.52)*	.191 (8.53)*	1.13 (10.1)*	1.1 (10.0)*
OWCT	.00 (1.81)***	-.000 (-.73)	.000 (1.42)	-.000 (-.82)	-8.7 (-.10)	.00 (2.1)**
IT	2.38 (.43)	-.000 (-.73)	2.61 (.46)	-.000 (.76)	-.000 (-1.47)	.000 (1.02)
MV/BV	.00 (1.71)***	.139 (6.83)*	.000 (1.05)	-.000 (-.16)	.010 (2.82)*	.001 (1.62)
Year Dummy	YES	YES	YES	YES	YES	YES
Adj R-squared	0.230	0.445	0.237	0.206	0.282	0.288
F-stat	282.48	9.50	204.12	29.31	21.48	45.05
Prob(F-stat)	0.000	0.000	0.000	0.000	0.000	0.000

Table 3: Regression Results (Model 2) Excluding 2008 Data, Using Least Squares Dummy Variable (LSDV): The Table Reports Coefficients of Variables and the T-Statistic in Brackets. *, **, ***, Denotes 1%, 5% and 10% Significance Respectively

Variables	Pooled	Construction	Manufacturing	Services	Wholesale	Retail
Constant	.016 (.366)	-.277 (-1.64)	.021 (.91)	-.13(-2.4)**	.030 (.43)	.020 (.38)
FLEV	-.000 (-1.53)	.001 (.07)	-.000 (-1.46)	.000 (.57)	-.001 (-1.19)	-.00 (-.67)
ROS	-.000 (-2.12)**	-.128 (-.33)	-.000 (-1.7)**	-.001 (-2.2)**	-.156 (-3.9)*	-.033(-.26)
AT	.013 (-2.93)*	.042 (1.14)	.022 (3.51)*	.016 (1.13)	.01 (1.7)***	.012 (1.25)
CR	-.003 (-2.93)*	.007 (.47)	-.003 (-2.91)*	-.002 (-.42)	-.001 (-.16)	-.008(-1.3)
ROA	.251 (27.36)*	.967 (2.84)*	.246 (23.41)*	.180 (7.99)*	1.12 (9.8)*	.966 (9.1)*
OWCT	.000 (1.82)***	-.000 (-1.02)	.000 (1.44)	-.000 (.53)	-9.20 (-.10)	.00(2.1)**
IT	2.10 (.36)	-.000 (-1.02)	2.70 (.47)	-.000 (-1.12)	-.000 (-1.56)	.000(1.16)
MV/BV	.000 (2.04)**	.134 (6.74)*	.000 (1.92)***	-.000 (-1.12)	.006 (2.6)**	.001(1.60)
Year Dummy	YES	YES	YES	YES	YES	YES
Adj R-squared	0.165	0.381	0.172	0.133	0.216	0.231
F-stat	185.02	8.75	135.66	17.42	16.02	33.15
Prob(F-stat)	0.000	0.000	0.000	0.000	0.000	0.000

5. Conclusion

This paper tests whether there is any relationship between salient accounting variables and equity returns of five US industries (Manufacturing, Services, Wholesale, Constructions and Retail) over a period of twenty years (1996-2015). Using a disaggregated industry data, the study finds that some but not all selected accounting variables used to measure operating performance, growth opportunities, capital structure and profitability affect stock returns when data is not pooled. However, the impact and directional effect of the salient accounting variables appear to be industry-specific. Such differential effect may be influenced by industry-

specific revenue generating process and the existing fluidity in industry-specific application of accounting standards. The empirical examination shows that when data is not pooled, but disaggregated by industry, accounting variables tend to exhibit the differential effects on equity prices. This study is particularly useful for corporate managers; portfolio managers and the general capital market participants to identify industry-related, market-relevant accounting variables and accordingly adopt policies to achieve their respective financial objectives.

References

- [1] Aaker, A. D, Jacobson, R. (2001), the Value Relevance of Brand Attitude in High-Technology Markets, *Journal of Marketing Research* 38 (4): 485-493. <https://doi.org/10.1509/jmkr.38.4.485.18905>.
- [2] Aboody, D. and Lev, B. (1998), "the value-relevance of intangibles: the case of software capitalization", *Journal of Accounting Research Supplement*, Vol. 36, pp.161-91. <https://doi.org/10.2307/2491312>.
- [3] Al Harbi, A.D. (2003). Do investors attach higher valuation weights to cash flow-based measures than to accrual-based measures in valuing intangible-intensive, high technology stocks? (Doctoral Dissertation, Florida Atlantic University).
- [4] Amir, E., & Lev B. (1996). Value-Relevance of non-financial information: the wireless communications industry. *Journal of Accounting and Economics*, 22, 3-30 [https://doi.org/10.1016/S0165-4101\(96\)00430-2](https://doi.org/10.1016/S0165-4101(96)00430-2).
- [5] Ball R. The Theory of Stock Market Efficiency: Accomplishments and Limitations. *Journal of Applied Corporate Finance*, 1995; 8(1):4-18. <https://doi.org/10.1111/j.1745-6622.1995.tb00270.x>.
- [6] Ball, R., Brown, P. (1968), "An empirical evaluation of accounting income numbers", *Journal of Accounting Research*, Vol. 6 pp.159-77. <https://doi.org/10.2307/2490232>.
- [7] Belkoui, A.R. (1992), *Accounting Theory*, Harcourt Brace Jovanovich, San Diego, CA
- [8] Beaver, W.; R. Lambert; and D. Morse. "The information Content of Security Prices." *Journal of Accounting and Economics* (March 1980): 3-28. [https://doi.org/10.1016/0165-4101\(80\)90013-0](https://doi.org/10.1016/0165-4101(80)90013-0).
- [9] Boone, J.P. (2002). Revisiting the reportedly weak value relevance of oil and gas asset present values: The roles of measurement error, model misspecification and time period idiosyncrasy. *Accounting Review*, 77(1), 73. <https://doi.org/10.2308/accr.2002.77.1.73>.
- [10] Burgsthaler, D., & Dichev I. (1998). Earnings, adaptation, and equity value. *The Accounting Review*, 72, 187-215
- [11] Chandra, U., & Ro, B.T. (2008). The role of revenue in firm valuation. *Accounting Horizons*, 22(2), 199-222. <https://doi.org/10.2308/acch.2008.22.2.199>.
- [12] Cheng, C.S.A., Yang, S.S.M. (2003), "The incremental information content of earnings and cash flows from operations affected by their extremity", *Journal of Business Finance & Accounting*, Vol. 30 No.1/2, pp.73-116. <https://doi.org/10.1111/1468-5957.00484>.
- [13] Christie Florou Constantinos Chalevas, (2010), "Key accounting value drivers that affect stock returns: evidence from Greece", *Managerial Finance*, Vol. 36 Iss 11 pp. 921 - 930
- [14] Dhaliwal, D.S. (1986), "Measurement of financial leverage in the presence of unfounded pension liabilities", *The Accounting Review*, Vol.61, pp.651-61.
- [15] Dukes, R. (1976), "An investigation of the effects of expensing research and development costs on security prices", in Sorter, M.C. (Ed.), *Proceedings of the Conference on Topical Research in Accounting*, New York University, New York, NY.
- [16] Easton, P. and T. Harris. (1991). "Earnings as an Explanatory Variable for Returns." *Journal of Accounting Research* 29, 19-36. <https://doi.org/10.2307/2491026>.
- [17] Fama, E. (1976), *Foundation of Finance*, Basic Books, New York, NY.
- [18] García-Ayuso, M., Monterrey J., & Pineda C. (1998). Empirical evidence on the convex relationship between prices, earnings and book values: the role of abnormal earnings in equity valuation. Working paper. University of Seville.
- [19] Graham, John R. Harvey, Campbell R. and Rajgopal, Shiva. The economic implications of corporate financial reporting, *Journal of Accounting and Economics* 40 (2005): 3-73 <https://doi.org/10.1016/j.jacceco.2005.01.002>.
- [20] Hand, J.R. (1990), "A test of the extended functional fixation hypothesis", *The Accounting Review*, Vol. 65, pp.740-63.
- [21] Harris, T.S. and Ohlson, J.A. (1987), "Accounting disclosure and the market's valuation of oil and gas properties", *The Accounting Review*, Vol. 62, pp.651-69.
- [22] Hirschey, M., V. J. Richardson, and S. W. Scholz. 2001. Value relevance of nonfinancial information: The case of patent data. *Review of Quantitative Finance & Accounting* (November): 223-236 <https://doi.org/10.1023/A:1012223625399>.
- [23] Hopkins, P.E., Houston, R.W. and Peters, M.F. (2000), "Purchase, pooling, and equity analysts' valuation judgments", *The Accounting Review*, Vol. 75, pp.257-81. <https://doi.org/10.2308/accr.2000.75.3.257>.
- [24] Hughes, K.E. (2000). The value relevance of nonfinancial measures of air pollution in the electric utility industry. *Accounting Review*, 75(2), 209. <https://doi.org/10.2308/accr.2000.75.2.209>.
- [25] Junttila, J., Kallunki, J., Karja, A., & Martikainen, M. (2005). Stock market response to analysts' perceptions and earnings in a technology-intensive environment. *International Review of Financial Analysis*, 14(1), 77-92. <https://doi.org/10.1016/j.irfa.2004.06.005>.
- [26] Kang, S. and Zhao, Y. (2010). Information content and value relevance of Depreciation: A cross-Industry Analysis, *The Accounting Review*, Vol.85 pp.227-260. <https://doi.org/10.2308/accr.2010.85.1.227>.
- [27] Kothari, S.P. (2001), "Capital markets research in accounting", *Journal of Accounting and Economics*, Vol. 31, pp.105-231 [https://doi.org/10.1016/S0165-4101\(01\)00030-1](https://doi.org/10.1016/S0165-4101(01)00030-1).
- [28] Lev, Baruch, and Paul Zarowin, (1999), "The boundaries of financial reporting and how to extend them", *Journal of Accounting Research*, 37 (2), 353-385. <https://doi.org/10.2307/2491413>.
- [29] Lev, B. and Sougiannis, T. (1996), "the capitalization, amortization, and value-relevance of R&D", *Journal of Accounting and Economics*, Vol.21, pp.107-38. [https://doi.org/10.1016/0165-4101\(95\)00410-6](https://doi.org/10.1016/0165-4101(95)00410-6).
- [30] Liang, C., & Yao, M. (2005). The value-relevance of financial and nonfinancial information-evidence from Taiwan's information electronics industry. *Review of Quantitative Finance and Accounting*, 24(2), 135-157 <https://doi.org/10.1007/s11156-005-6334-1>.
- [31] Liu, J., Liu, C. (2007), "Value relevance of accounting information in different stock market segments: the case of Chinese A-, B-, and H-shares", *Journal of International Accounting Research*, Vol. 6 pp.55-81. <https://doi.org/10.2308/jiar.2007.6.2.55>.
- [32] Luft, J.L. and Shields, M.D. (2001), "why does fixation persist? Experimental evidence on the judgment performance effects of expensing intangibles", *The Accounting Review*, Vol. 76, pp.561-87. <https://doi.org/10.2308/accr.2001.76.4.561>.
- [33] Merton H. Miller and Franco Modigliani (1961), Dividend Policy, Growth, and the Valuation of Shares, *the Journal of Business*, Vol. 34, No. 4 (Oct., 1961), pp. 411-433. <https://doi.org/10.1086/294442>.
- [34] Negakis, C.J. (2005). Accounting and capital markets research: A review. *Managerial Finance*, 31(2), 1-23.
- [35] Panagiotis E. Dimitropoulos, Dimitrios Asteriou, (2009), "The value relevance of financial statements and their impact on stock prices: Evidence from Greece", *Managerial Auditing Journal*, Vol. 24 Iss 3 pp. 248-265 <https://doi.org/10.1108/02686900910941131>.
- [36] Penman, S. H. "Financial Statement Information and the Pricing of Earnings Changes." *The Accounting Review* 67 (1992): 563-77.
- [37] Pradosh Simlai, (2009), "Stock returns, size, and book-to-market equity", *Studies in Economics and Finance*, Vol. 26 Iss 3 pp. 198-212 <https://doi.org/10.1108/10867370910974026>.
- [38] Richardson, Gordon D, and Surjit Tinaikar. 2004. Accounting based valuation models: what have we learned? *Accounting and Finance* 44:223-255. <https://doi.org/10.1111/j.1467-629X.2004.00109.x>.
- [39] Riley, R.A., Pearson, T.A., & Trompeter, G. (2003). The value relevance of non-financial performance variables and accounting information: The case of the airline industry. *Journal of Accounting & Public Policy*, 22(3), 231-254. [https://doi.org/10.1016/S0278-4254\(03\)00021-8](https://doi.org/10.1016/S0278-4254(03)00021-8).
- [40] Scott, W. 2003. *Financial Accounting Theory*. Pearson Education. Toronto, Ontario.
- [41] Scott Pirie, Malcolm Smith, (2008), "Stock prices and accounting information: evidence from Malaysia", *Asian Review of Accounting*, Vol. 16 Iss 2 pp. 109-133 <https://doi.org/10.1108/13217340810889924>.
- [42] Tan, P.M., & Lim, C.Y. (2007). The value relevance of accounting variable and analysts' forecasts: The case of biotechnology firm. *Review of Accounting & Finance*, 6(3), 233-253. <https://doi.org/10.1108/14757700710777992>.
- [43] Tinic, S.M. (1990), "A perspective on the stock market's fixation on accounting numbers", *The Accounting Review*, Vol. 65, pp.781-96.
- [44] Wasiuzzaman, S., Sahafzadeh, I., Rezaie Nejad, N. (2015). Prospect theory, industry characteristics and earnings management: A study of Malaysian industries. *Review of Accounting and Finance*, 14 (3), 324-347. <https://doi.org/10.1108/RAF-07-2014-0075>.
- [45] Watts, R.L. and Zimmerman, J.L. (1986), *Positive Accounting Theory*, Prentice-Hall, London.

Appendix

FLEV (Financial leverage) = Total Assets/Total Equity: This ratio shows how many dollars of assets a firm generates for every dollar invested by its shareholders.

ROS (Return on sales) = Net Income/Revenue: This ratio provides an indication of the capability of a firm to generate profits from each dollar of sales.

AT (Asset turnover) = Revenue/Total Assets: This ratio indicates how effective and efficient firms employ assets in order to increase sales.

CR (Current ratio) = Total Current Assets/Total Current Liabilities: This ratio measures a firm's ability to cover its short-term obligations with its current assets

ROA (Return on assets) = Net Income/Total Assets: This ratio shows how much profit a company is able to generate for each dollar of assets invested.

OWCT (Operating working capital turnover) = Revenue/ (Total Current Assets – Total Current Liabilities): This ratio measures what amount of sales has been achieved by each dollar of average working capital.

IT (Inventory turnover) = Cost of Goods Sold/Inventory: The inventory turnover ratio evaluates how efficient firms manage inventory and generate sales

Market to book (MV/BV) = (Closing price * # of Common Shares Outstanding) / Net Asset Value: The market to book ratio measures the market value of a company relative to its book or accounting value.