An Empirical Study on Value-Based Performance Measures, Stakeholder Satisfaction, and Stock Prices

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Abstract

This study examines the implications of value-based financial measures such as return on equity, return on assets, market-value-added, and economic-value-added on the Dow Jones Industrial, Transportation, and Utilities company stock prices. It also examines stakeholder satisfaction on firm performance using several financial proxies. Using cross-sectional data and regression analysis, the results indicate that all value-based performance measures have a significant relationship with prices. The results also show that stockholder satisfaction, measured by return on equity, has a strong and positive correlation with share values. Consumer satisfaction, measured by sales volume, also showed a strong relationship with stock prices. However, the significance of the relationship between bondholder satisfaction measured by the time-interest-earned ratio and prices varied from positive to negative and was insignificant. The effect of taxes as a proxy for corporate social responsibilities on share values was mostly insignificant. Overall, the results show that stock price maximization as the primary goal of a firm may lead to the satisfaction of stockholders and consumers. However the relationship between price maximization strategy and bondholders and society satisfaction require further investigations.

Key words: Value-Based Performance Measures, Stockholder Satisfaction, Bondholder Satisfaction, Stock Price

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Introduction

It has been argued that a successful company is the one that satisfies the needs of all of its stakeholders. Since satisfying the needs of all stakeholders incurs costs, increasingly, the success of a public firm is measured purely by its ability to maximize its share values. It is believed that maximizing share values satisfies all stakeholders in the firm including stockholders, customers, employees, and society.

The objectives of this study are twofold. First, we examine which value based financial measures have the strongest effect on share values and can be used as a target to improve a firm’s performance. Second, we test for stakeholder satisfaction with firms' performance by using proxy variables representing the satisfaction of stakeholders including stockholders, bondholders, consumers, and society in general.

Using quarterly data for the period 1980-2005, several value-based financial measures are utilized to investigate the first objective by testing the impact of such variables on share values of 65 firms in the Dow Jones Industrial, Transportation, and Utilities Indexes. Return on equity (ROE), return on total assets (ROA), market-value-added (MVA), and economic-value-added (EVA) are value-based measurements considered in this study. The second objective is tested by using regression analysis on the same data set to explore the relationship between stock prices and stakeholder satisfaction. Return on equity, sales, time-interest-earned ratios, and the amount of taxes paid by companies are assumed to proxy for stockholders, bondholders, consumers, and society’s approval of the firms’ performance. The individual firms are also exposed to market risk that may have an adverse effect on maximizing share values. Such risk is measured by a company’s beta risk.

A combination of financial and nonfinancial factors is believed to affect corporate shareholder values. One of the early attempts to estimate the share values using financial variables was made by Williams (1938), who introduced the dividend discount model. Miller and Modigliani (1961) argued that a firm’s value is determined only by its basic earning power and its business risk. The value of the firm depends on the income produced by its assets, not on how this income is split between dividends and retained earnings. Later, Gordon (1962) argued that firm's value will be maximized by setting a high dividend payout ratio (Bird-in-the-Hand Theory). Graham, Dodd, and Cottle (1962) claimed that a firm's estimated earnings is the most important factor in determining stock prices. Taking a different approach, Fama (1965) argued that stock price performance resembled a random walk and in a later study (1970), he introduced the theory of Efficient Market Hypothesis and challenged the validity of intrinsic valuation models and the use of historical and public information in estimating stock prices. Lee, Myers, and Swaminathan (1999) compared alternative estimates of the share value for 30 stocks in the Dow Jones Industrial Index for the period 1963-1996 and found that traditional valuation methods using multiplier techniques have little predictive power. More recently, Pitman (2003) has shown that a sustained-value growth strategy is the best long-term measure of company performance that creates greater value for shareholders. He demonstrates that using a single financial ratio such as return on equity as the key indicator of profitability enhances stock prices. Several studies have discussed the use of EVA and other value based measures; Ittner and Larker (1998b, 2001) and Sprinkle (2003), with mixed empirical evidence as to the success of these measures.

Beside the financial factors stated above, studies have shown the influence of nonfinancial variables on share values. Eccles et al. (2001) and others (Maines et al. 2002, Pitman 2003) have noted that more firms are using nonfinancial performance measures to evaluate firm performance at a variety of levels. Moskowitz (1972) concluded that the explicit costs of corporate social responsibility actions are minimal but firms may benefit from social responsibility actions in terms of employee morale and productivity. Amir and Lev (1996) examined the total population in a service area for the cellular telephone industry and the ratio of subscribers to total population and found a positive correlation for both with market equity. Using customer satisfaction indices published by Fortune magazine, Ittner and Larcker (l998a) found that abnormal returns existed surrounding the stock returns following the release of these measures, and later they studied the relationship of nonfinancial measures on stock performance (1998b). Banker et al. (2000) using "Predictive Ability Tests," studied the relationship between current nonfinancial measures and future financial variables. They tested the predictive power of customer satisfaction measures and found that customer complaints and returning customers indicated future revenue and profit for the hotel industry. Hughes (2000) investigated the electric utilities industry, finding a strong relationship between sulfur dioxide emissions and market share value. Using regression analysis, Hirschey et al. (2001) studied the direct contemporaneous link between the nonfinancial measures of patent quality to research and development expense and market share value and found a positive correlation for both. Said et al. (2003) found that firms that employed a combination of financial and nonfinancial measures had significantly higher levels on return on assets and market returns.

Considering that a sustained-value growth strategy creates greater share values and increased stock prices satisfy stakeholders, using the value-based financial measures described earlier, we first investigate the impacts of these variables on the share values of the Dow Jones Industrial, Transportation, and Utilities Indexes firms. It is expected that the ROE and consumer satisfaction will have a positive affect on share values. The satisfied customers, by their repeat and increased purchases, raise company sales and profit which this, in turn, leads to higher share values. Increases in sales can also occur due to the introduction of new products, services, and/or by mergers and takeover activities. Any increase in sales could show consumer satisfaction for firm performance. Bondholders also have strong interests in the financial health and performance of the firms. Higher financial risk would suggest higher potential risk to bondholders. The time-interest-earned ratio (TIE) is assumed to measure the financial risk; a higher TIE ratio would indicate the ability of the firm to pay interest on debt, and a lower TIE would signify an inability to carry on the firm's short-term financial obligations. The social responsibilities of the firms are measured by the amount of taxes paid. On the one hand, higher tax payment could present a firm as socially responsible and enhance its image. On the other hand, higher taxes reduce net income to the shareholders and thus could have a negative effect on share values. The net effect of taxes on share values needs to be tested statistically

The data are obtained from the COMPUSTAT data base and several Web sites. The sample includes quarterly data for all firms in the Dow Jones Industrial (DJ30) Transportation (DJ20), and Utility (DJ15) for the period 1980.1-2005.1. Some data series are generated using the COMPUSTAT data base Web sites.

The methodology, data and empirical results, and conclusion follow.

Methodology

Using a single financial ratio such as return on equity (ROE) as the key indicator of profitability and value-based management tools is believed to enhance share values. Targeting other value-based financial indicators such as return on total assets (ROA), market-value-added (MVA), and economic-value-added (EVA) may also improve corporate value. These financial variables are appealing because they explicitly tie together the investment decisions with measures of firm performance. The ROA is the return on total assets by firm, whereas MVA shows the present value of all expected future value added to the firm. The EVA is a measure of operating performance that indicates how successful a firm has been at increasing the market value of a company in any given period. EVA can be thought of as the incremental contribution of a firm's operations to the creation of MVA. MVA is the present value of all expected future EVA. EVA provides a good measure of the extent to which the firm operates in a manner that is consistent with maximizing shareholder value.

To test the significance of value-based performance indicators on share value, the regression model takes the following form

$$P = a_0 + a_1 X_i + \varepsilon \quad (1)$$

where,

X_i = Represent either ROE, ROA, MVA, and/or EVA

P = Stock Prices

ROE = Return on Equity

ROA = Return on Total Assets
MVA = Market Value Added
EVA = Economic Value Added

To examine stakeholder satisfaction from the firm performance the following multiple regression is tested.

$$P = a_0 + a_1 ROE + a_2 TIE + a_3 S + a_4 T + a_5 \beta + \varepsilon \qquad (2)$$

Where,
TIE = Time-Interest-Earned Ratio
S = Sales
T = Taxes Paid
β = Measure of Market Risk

The ROE, sales, and time-interest-earned ratios are assumed to measure the stockholder, consumer, and bondholder satisfaction in firm performance. The social responsibilities of firms is measured by the amount of taxes paid, and the market risk that individual firms are exposed to and may have an adverse effect on share values is measured by the company's beta (β). It is anticipated that the variables ROE, ROA, MVA, EVA, and S will have a positive effect and TIE and β will have negative effects on the share values. The result of taxes (T) may vary from negative to positive.

Variable Calculation:

ROE = Net Income/Total Common Equity
ROA = Net Income/Total Assets
MVA = (Stock Price) x (Common Shares Outstanding) – Total Common Equity ($)
EVA = EBIT (1-T) – Total Capital x WACC
TIE = Time-Interest-Earned Ratio = Operating Income/Interest Charges
EBIT = Operating Income= (Operating Income before Depreciation - Depreciation & Amortization)
T = Marginal Tax Rate = (Pretax Income- Net Income)/ Pretax Income

WACC= After-tax percentage cost of capital is calculated as weighted average cost of debt, preferred stock, and equity using the following formula:

$$WACC = w_d k_d (1-T) + w_p k_p + w_e k_e$$

Where, W_d, W_p,, W_e are the weights used for debt, preferred, and common equity.

W_d = Long-term total debt/total assets
W_p = Preferred stock carrying value/total assets
W_e = Common equity/total assets
K_d = Before tax component cost of debt=interest expenses/ (debt in current liabilities plus long-term debt)
K_p = Component cost of preferred stock = preferred stock dividends/preferred stock carrying value
K_e = Component cost of equity = D_1/P_0 +G and $K_e = R_f + (R_m – R_f)\ \beta i$
D_1 = Expected dividend
P_0 = Current stock price
R_f = 3- month t-bill rate
R_m = Market return, measured as return on S&P 500
G = Earning growth rate, retention rate time return on equity
β_i = Measure of market risk, covariance between stock and market returns divided by variance of market return

Data Analysis

The quarterly data are obtained from the COMPUSTAT database. The sample includes data for all firms in the Dow Jones Industrial, Transportation, and Utility Averages for the period 1980.1-2005.1. Data are first used to calculate the quarterly financial series that are considered relevant to this study. The quarterly series for each firm are then are averaged to calculate the profitability indicators plus the TIE, sales, and taxes paid. The beta (β) for each firm is estimated by dividing the covariance between returns in stock and market by the variance of the market. The change for each variable is defined as the difference in its value between quarter t and t-1 data.

Unit Roots and Cointegration Tests

The Augmented Dickey-Fuller (1979) and Phillips-Peron (1988) tests are employed to investigate the stochastic behavior of the variables included in the regressions. Unit root results (not reported here) reveal that all variables but sales (S) and taxes (T) are integrated of order one and are nonstationary (variables S and T are stationary). Differencing the time series to create stationary in regression analysis is a normal practice, but many researchers have argued that such differencing may result in a loss of information about the long-run relationships between variables (Sims, (1980). Stock and Watson (1988) have indicated that if time series are co-integrated of the same order, an ordinary least square (OLS) regression yields a "super-consistent" estimator for the co-integrating parameters without differencing. The Johansen cointegration (1995) approach is applied to test whether the data series used in this study are cointegrated of the same order and can be included in the same regression. The test results confirm that (though not reported here) at least one cointegrated equation at the 0.05 level between variable P and the rest of the variables except MVA exist. Such results imply that all integrated variables with the same order can be included in the same regression models without differencing the data. However, to include variables P and MVA in the regression analysis, they both need to be differenced to create stationary series.

Results

We begin our analysis with a brief look at the estimated variables and descriptive statistics using quarterly data of the Dow Jones 30 (DJ30), Transportation 20 (DJ 20), and Utility 15 (DJ15). Tables 1, 2, and 3 report summary data on variables used in the study. Table 4 presents descriptive statistics on DJ 30, 20, 15, and on the aggregated data which is constructed combining data from the three indexes to form DJ65. We use regression analysis on DJ65 to evaluate the significance of each value-based variable affecting stock prices. Table 5 summarizes the regression results using stock price as the dependent variable and the ROE, ROA, MVA, and EVA as independent variables. The results of separate regressions on each value-based measure reveal which variable has the furthermost influence on the share values. Table 6 includes the Ordinary Least Squares regressions results using stock prices as the dependent variable and ROE, TIE, Sales (S), and Taxes (T) as exogenous variables. Table 6 also includes the influence of market risk measured by β on prices.

Insert Tables 1, 2 and 3 Here

As was expected and shown in Table 4, stock prices of the utility companies are less volatile than the industrial and transportation firms. The volatility measured by the standard deviation (SD) and coefficient of variation (CV) for DJ15 are $5.538 and 0.187 while they are $15.15 and 0.257 for DJ30, and $13 and 0.346 for the DJ20, respectively. The market risk measured by the average beta is lower for DJ15 than DJ30, DJ20, and DJ65. They are 0.823, 1.57, 1.121, and 1.303 respectively. The DJ30, DJ20, and DJ65 share values have the highest correlation coefficient with the MVA than the remaining variables appearing in the Table 4.

Insert Table 4 Here

An analysis of regressions (1) through (4) appearing in Table 5 suggests that all value-based performance measures have a significant relationship with the stock prices at the 5 percent significance level. The R-squares of the regressions vary across different equations from 18 percent to 79 percent with regression (3) having the highest R-square. The estimated results imply that among the four value-based measures, the MVA is the most important performance indicator.

Insert Table 5 and 6 Here

The results of regression (1) appearing in Table 6 reveal that the return on equity (ROE) has a strong positive effect on prices at 5 percent significant level. Although variable S has the expected positive sign, it is statistically insignificant at the 5 percent level. The time-interest-earned ratio (TIE) which proxies the bondholder satisfaction with firm performance has an insignificant effect on share values. Moreover, results show that the estimated coefficient of T has positive sign but is statistically insignificant. The regression (2) eliminates variable T and regression (3) deletes variables TIE and T from regression (1). The estimated results in both regressions show that ROE and S are strong explanatory variables. To test whether including the market risk factor (β) into the regression would alter the results, the β was added into the regression (1) and test results appear in regression (4). As is apparent from the regression (4), although the effects of ROE and S on the dependent variable are both positive, their statistical significance is slightly diminished. The remaining variables also have insignificant estimated coefficients.

Equation (5) in Table 6 was tested replacing the ROE as a value-based performance measure with the MVA and leaving the remaining variables in the regression. The results show that all estimated variables have the expected signs and are significant at the 5 percent significance level. Plus, the high R-squared of 0.883 indicates that about 88 percent of the variation in stock prices is explained by the independent variables. The MVA and S have a strong and positive effect on the dependent variable, whereas, TIE, T, and β have strong and negative effect on share value.

It is comprehensible to justify the negative relationship between prices, market risk, and taxes. Normally, higher market risk adversely affects share values. Historical experience indicates that when the stock market undergoes changes, prices of most individual securities also change, thus a declining market tends to push individual stock prices down, whereas the reverse occurs in a rising market. Also, higher taxes signify lower net income to the share holders; this could unfavorably impact share value. Normally, a higher TIE ratio indicates lower financial risk and was expected to have a positive effect on prices. However the strong and negative estimated coefficient of the TIE in regression (5) can be justified. Lower interest expense and/or higher operating income leads to a higher TIE ratio. Due to the high market interest rates, firms may decide to lower debt financing and consequently its interest expense. According to the Trade-off theory in finance, a firm's stock price will be maximized if it uses virtually 100 percent debt. Thus, reduction of interest costs due to any decline in debt financing could lower the stock prices.

Overall, the cross-sectional regression results on D65 indicate that all value-based performance measures have a significant relationship with prices. However, the MVA showed the best results. Among all variable used to measure stakeholder satisfaction, return on equity and sales showed a strong relationship with prices. The TIE and T showed conflicting results indicating that stock price improvements may not satisfy bondholders and society and an increase in TIE and T may adversely affect stock price maximization goals.

Conclusion

This paper studies first the relationship between several value-based performance measures with stock prices. Using cross-section data combining information from DJ30, DJ20, and DJ15 to form DJ65 we find that the market-value-added variable has the strongest relationship with stock prices. This finding implies that targeting MVA as a performance measure perhaps yields a better result than probably aiming indicators such as ROE or ROA. We also examine the relationship between stock price and stakeholders' satisfaction measured using some proxies. We find that stockholder interests in firm performance measured by ROE to have a significant and positive estimated coefficient with stock prices. The bondholders' satisfaction measured by TIE shows weak results. Although a higher TIE ratio means better liquidity and lower financial risk, higher market interest rates imply that companies with higher debt could face higher interest expenses which, in turn, lead to a higher cost of capital that lower net income and cause prices to decline. Moreover, the higher interest costs increase a firm's financial risk at the potential displeasure of debt holders. Consumer satisfaction, as measured by sales, has a positive and insignificant relationship with the prices, indicating that stock price maximization makes firms' customers satisfied with its performance. The test results showing the corporate social responsibility, measured by the amount of taxes paid, with share values were inconclusive, meaning that price maximization and corporate social responsibilities, practiced through tax payments, are not correlated. Overall, the results show that stock price maximization as the primary goal of a firm may lead to the satisfaction of stockholders and consumers. However the relationship between prices maximization strategy, bondholders, and society interests requires further investigation.

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Table 1: Average Data on the Dow Jones Industrial Index Firms Over 1980.1-2005.1

Variable Symbol	Price($) P	ROE(%)	ROA(%)	MVA($)	EVA($)	TIE(x)	Sales($) S	Taxes($) T	Market Risk(β)
AA	50.31	2.23	0.86	29.98	0.44	5.90	2975.99	81.13	0.99
AIG	85.64	3.34	0.41	57.58	Na	Na	6657.47	272.75	2.28
AXP	48.02	4.73	0.32	34.91	-0.18	Na	4597.97	138.12	2.72
BA	48.27	3.34	1.08	30.21	0.89	4.95	7535.75	88.52	1.25
C	41.65	4.76	0.35	24.49	Na	1.77	8956.35	594.27	Na
CAT	55.97	3.34	0.82	33.98	Na	2.37	3487.31	60.32	1.18
DD	58.61	4.01	1.45	38.81	0.72	5.92	7822.77	339.54	1.16
DIS	57.91	2.13	1.00	44.62	Na	24.83	2986.09	152.41	1.05
GE	65.27	5.25	0.71	55.05	Na	8.28	17707.74	643.00	1.88
GM	54.90	2.06	0.24	12.76	4.12	1.7	33007.66	221.06	0.73
HD	38.33	4.67	2.94	30.21	Na	150	5039.52	181.38	0.94
HON	42.94	3.03	1.03	28.76	1.11	7.47	3578.58	84.88	2.19
HPQ	54.66	3.02	1.57	40.30	Na	15.58	6881.55	132.19	2.04
IBM	100.89	4.14	1.54	71.39	1.70	22.51	16190.78	725.74	1.18
INTC	50.54	5.19	3.91	42.87	0.40	106	3260.14	319.24	1.40
JNJ	63.84	6.66	3.76	53.57	Na	33.18	4458.55	270.23	2.29
JPM	45.65	2.86	0.17	18.93	Na	Na	5375.55	238.74	2.91
KO	53.05	8.97	3.94	48.24	0.49	17.60	3340.32	754.02	1.96
MCD	46.32	4.52	2.08	35.90	0.51	6.41	2151.63	137.08	1.93
MMM	83.43	5.85	2.97	64.40	Na	30.80	3152.78	195.04	1.93
MO	63.71	9.53	2.51	52.24	Na	9.77	10198.52	755.68	1.09
MRK	81.51	9.41	4.12	73.19	Na	24.90	3690.36	340.45	2.99
MSFT	73.58	4.50	3.57	62.42	Na	Na	3032.88	440.10	Na
PFE	59.61	5.32	2.75	53.60	Na	20.44	3487.14	229.77	1.25
PG	77.36	6.07	2.38	63.16	0.82	9.39	6883.17	295.52	0.89
T	39.73	1.51	0.56	18.93	0.66	6.36	13683.11	407.38	0.66
UTX	62.67	4.36	1.33	37.90	1.47	7.02	5351.18	121.53	0.82
VZ	61.04	4.55	1.10	46.29	Na	5.14	7554.49	409.19	Na
WMT	42.43	5.51	2.20	35.09	0.35	8.88	22444.58	436.63	1.89
XOM	57.11	4.83	2.21	37.01	0.71	30.35	31371.03	1299.96	0.73

Note: Average value for each variable is equal to the quarterly data averaged over the sample period. Na indicates non availability or insufficient data to calculate the required value. , market risk is measured by beta β. Variables considered are stock prices (P), return on equity (ROE), return on assets (ROA), market-value-added (MVA), economic-value-added (EVA), time-interest-earned (TIE), sales (S), taxes (T) , and market risk (β).

Table 2 : Average Data on the Dow Jones Transportation Index Firms Over 1980.1-2005.1

Variable Symbol	Price($) P	ROE(%)	ROA(%)	MVA($)	EVA($)	TIE(x)	Sales($) S	Taxes($) T	Market Risk(β)
ALEX	30.16	3.39	1.50	13.18	Na	5.83	209.01	8.74	1.41
AMR	46.63	-0.34	-0.70	9.86	1.57	1.43	3152.31	16.36	0.72
BNI	51.06	2.65	0.84	24.77	1.27	4.32	1689.00	77.88	1.71
CAL	19.78	-36.79	-0.33	18.50	0.24	0.60	1468.27	10.30	Na
CHRW	35.07	5.83	2.99	29.97	Na	Na	725.75	12.52	Na
CNF	30.66	1.66	0.51	13.19	-1.18	8.43	858.59	10.71	2.28
CXS	43.05	2.00	0.61	12.38	1.48	2.96	2020.86	44.97	1.19
EXPD	29.49	5.20	2.99	22.80	Na	83.8	232.23	5.94	Na
FDX	56.20	2.85	1.15	32.09	1.02	7.31	2604.38	56.07	0.40
GMT	37.78	2.21	0.38	10.72	2.63	1.50	262.43	7.31	1.33
JBHT	22.34	3.00	1.23	12.91	Na	9.09	298.84	6.37	Na
JBLU	32.32	2.35	0.63	25.15	Na	3.3	176.23	8.28	Na
LSTR	41.96	6.92	2.33	33.64	Na	15.8	338.28	5.71	Na
LUV	25.36	2.95	1.39	18.14	Na	5.63	641.50	28.47	1.57
NSC	48.01	2.56	1.02	22.38	Na	5.57	1145.31	68.25	1.22
OSG	22.22	2.06	0.91	-0.90	Na	1.66	97.22	4.11	1.35
R	29.45	2.64	0.62	11.67	1.37	2.30	1046.24	17.37	0.95
UNP	58.19	2.34	0.76	23.55	0.96	3.48	2101.98	71.04	0.86
UPS	64.26	5.47	2.46	53.60	Na	157.2	4574.42	198.50	2.55
YRCW	27.27	1.92	0.70	8.95	Na	Na	617.60	6.57	0.28

Note: Average value for each variable is equal to the quarterly data averaged over the sample period. Na indicates non availability or insufficient data to calculate the required value. , market risk is measured by beta β. Variables considered are stock prices (P), return on equity (ROE), return on assets (ROA), market-value-added (MVA), economic-value-added (EVA), time-interest-earned (TIE), sales (S), taxes (T) , and market risk (β)

Table 3: Average Data on the Dow Jones Utilities Index Firms Over 1980.1-2005.1

Variable Symbol	Price($) P	ROE(%)	ROA(%)	MVA($)	EVA($)	TIE(x)	Sales($) S	Taxes($) T	Market Risk(β)
AEP	30.66	2.79	0.69	8.12	0.10	6.01	2032.90	81.19	0.85
AES	30.77	-1.25	-0.12	25.31	Na	Na	879.72	32.80	-
CNP	27.95	1.90	0.45	9.20	-1.44	2.41	1630.95	54.70	0.64
D	40.31	2.73	0.75	11.63	0.48	2.52	1358.03	0.44	0.90
DUK	38.09	3.06	0.88	17.61	0.28	3.49	2544.18	0.49	0.79
ED	34.45	3.15	1.21	8.10	0.47	4.39	1652.09	87.07	0.94
EIX	27.08	3.39	0.77	9.37	0.61	2.42	1885.50	99.68	1.79
EXC	28.33	3.41	0.86	9.87	0.52	2.44	1419.54	77.26	1.02
FE	22.26	2.95	0.78	3.10	0.37	2.20	1009.44	53.70	1.06
NI	21.27	2.52	0.63	5.69	0.16	2.61	727.09	26.37	0.30
PCG	23.58	2.76	0.74	5.05	-.07	2.37	2710.21	147.84	0.69
PEG	30.74	3.32	0.90	8.86	0.46	2.73	1469.38	74.96	0.63
SO	24.40	3.57	1.00	8.89	0.48	2.82	2105.55	142.64	1.00
TXU	33.83	1.83	0.47	6.94	-1.68	2.25	1738.32	53.61	0.39
WMB	30.14	1.17	0.24	16.36	-0.39	1.79	1142.47	26.74	0.53

Note: Average value for each variable is equal to the quarterly data averaged over the sample period. Na indicates non availability or insufficient data to calculate the required value. , market risk is measured by beta β. Variables considered are stock prices (P), return on equity (ROE), return on assets (ROA), market-value-added (MVA), economic-value-added (EVA), time-interest-earned (TIE), sales (S), taxes (T) , and market risk (β)

Table 4: Descriptive Statistics on Dow Jones Industrial, Transportation, Utility, and Composite Indexes Over 19801- 2005.1

Variables	Price	ROE	ROA	MVA	EVA	TIE	Sales	Tax	β(beta)
DJ30									
Correlation		1.00	0.29		0.24	0.85	0.28	-0.13	-
0.01	0.19	0.08							
Mean	58.83	4.65		1.89	42.55	0.95	21.82	8562	
	345.52	1.57							
SD	15.15	2.01		1.24	15.67	0.99	33.27	8046	
	273.85	0.69							
CV	0.257	0.43		0.65	0.37	1.04	1.53	0.94	0.79
	0.44								
DJ20									
Correlation		1		0.33		0.11	0.64	0.33	0.37
	0.76	0.78	0.32						
Mean	37.56	1.04		1.09	19.82	1.04	17.78	1213.02	
	33.273	1.121							
SD	13.00	9.05		0.97	11.83	1.05	39.59	1183.24	
	46.06	0.84							
CV	0.346	8.67		0.88	0.59	1.00	2.23	0.97	1.38
	0.75								
DJ15									
Correlation		1		0.09		0.03	0.46	0.05	0.26
	0.16	0.52	0.04						
Mean	29.59	2.48		0.68	10.27	0.025	2.889	1629.35	
	63.69	0.823							
SD	5.538	1.23		0.32	5.638	0.724	1.095	573.96	
	44.53	0.363							
CV	0.187	0.49		0.47	0.55	28.96	0.38	0.35	0.69
	0.44								
DJ65									
Correlation		1		0.33		0.42	0.89	0.43	0.19
	0.40	0.54	0.40						
Mean	45.53	3.04		1.32	28.11	0.62	16.00	4698.87	
	184.47	1.303							
SD	17.98	5.39		1.10	18.80	1.00	31.81	6544.98	
	240.31	0.676							
CV	0.385	1.77		0.83	0.67	1.61	1.99	1.39	1.30
	0.52								

Note: Price is the average price of all DJ30, 20, 15, and 65 third quarter stock prices, ROE is return on equity, ROA is return on assets, MVA and EVA are market and economic value-added, TIE is time-interest-earned ratio, Tax is the average tax paid, and β represents the market risk.

Table 5

Regression Results on the DJ65 Showing the Stakeholder Satisfaction from Firm Performances. The Dependent Variable is "Stock Price." The Independent Variables Are ROE, ROA, MVE, and EVA.

$$P = a_0 + a_1 X_i + \varepsilon$$

Independent Variables

Regression No	Intercept	ROE	ROA	MVA	EVA	R^2
(1)	29.83019	4.303025	____	____	____	0.223
	(7.13)	(4.26)				
(2)	36.39644	____	6.900855	____	____	0.179
	(11.39)		(3.71)			
(3)	21.51274	____	____	0.854606	____	0.799
	(11.80)			(15.82)		
(4)	38.19112	____	____	____	7.014106	0.181
	(13.09)				(2.82)	

Note: Note: Price is the average of the third quarter stock prices of each firm in DJ30, DJ20, and DJ15 aggregated to form DJ65. ROE is return on equity, ROA is return on total assets, MVA is the market-value-added, and EVA is the economic value added.

Table 6

Regression Results on the DJ65 Showing the Stakeholder Satisfaction from Firm Performances. The Dependent Variable is "Stock Price." The Independent Variables Are ROE, TIE, S, T, and β.

$$P = a_0 + a_1 ROE + a_2 TIE + a_3 S + a_4 T + a_5 \beta + \varepsilon$$

Independent Variables

Regression No	Intercept	ROE	TIE	S	T	β	R^2
(1)	27.16184	3.583302	-0.014432	0.000636	0.009017	-----	0.365
	(5.87)	(2.70)	(0.18)	(1.46)	(0.63)		
(2)	25.93755	4.094410	-0.014989	0.000845	-----	-----	0.360
	(6.20)	(3.89)	(0.19)	(2.98)			
(3)	27.58493	3.768449	---- 0.000893	-----		----	
	0.326	(6.90)	(3.90)	(3.06)			
(4)	24.84266	3.111881	0.013890	0.000611		0.007183	
	4.390593	0.388	(4.52)	(1.82)		(0.16)	
	(1.36)	(0.44)	(1.05)				

$$P = a_0 + a_1 MVA + a_2 TIE + a_3 S + a_4 T + a_5 \beta + \varepsilon$$

(5)	26.63180	0.972918	-0.080399	0.000521	-0.014341		-4.79
	0.883	(12.03)	(14.46)	(2.12)	(2.85)	(2.38)	(2.67)

Note: Price is the average of the third quarter stock prices of each firm in DJ30, DJ20, and DJ15 aggregated to form DJ65. ROE is return on equity, TIE is time-interest-earned ratio, S is sales, T is Taxes paid, and β represents the market risk.