ELLER COLLEGE OF MANAGEMENT
HSLopez School of Business Analytics

ANALYTICS REPORT

TO: FISHER INVESTMENTS

FROM: JAKE MOORE

SUBJECT: IDENTIFYING POTENTIALLY PROFITABLE COMPANIES

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Introduction

In this brief analysis, we analyzed data from approximately 1,501 companies listed on the New York Stock Exchange (NYSE) to determine which financial variables best predicted Earnings per Share. The purpose of this analysis is to identify which factors have the most statistically significant impact on Earnings per Share and provide recommendations for potential investment opportunities based on our findings.

A multiple regression analysis was conducted using three different variables that we found using a preliminary correlation analysis. These variables included Earnings before Tax, Operating Margin, and Pre-Tax Margin. The analysis conducted included tests of both joint and individual significance, to determine statistically significant effects across all different variables.

Results concluded that Earnings before Tax, and Operating Margin are both statistically significant predictors of Earnings per Share, while Pre-Tax Margin is not.

Based on these findings, we recommend focusing on companies with higher Earnings before Tax and avoiding companies with higher Operating Margins to maximize potential Earnings per Share benefits.

Data Analysis

The following section presents regression equations, an analysis of the model fit, and hypothesis tests that all evaluate how Earnings per Share are influenced by Earnings before Tax, Operating Margin, and Pre-Tax margin. We conducted multiple significance tests including test of joint significance, and individual tests of significance for each x-variable. Finally, a recommendation is provided to maximize Earnings per Share at the bottom of this section.

Population Regression Equation

$$EPS = \beta_0 + \beta_1(EBT) + \beta_2(Operating\ Margin) + \beta_3(Pre\ Tax\ Margin) + \epsilon$$

Estimated Sample Regression Equation

$$\widehat{EPS} = 4.21 + 2.13E-10(EBT) - 0.066(Operating\ Margin) - 0.009(Pre\ Tax\ Margin)$$

Fit of the Model

The $R^2 = 0.1974$ tells us we are 19.74% of the way toward perfectly predicting Earnings per Share using this model.

The standard error of 4.278 tells us that, on average, the models predicted Earnings per Share values have an inaccuracy of $4.278 compared to the actual values. While this model shows part of the variation in EPS, there is still a considerable amount that is not represented by this model.

- Based on the R^2 and the Standard Error, we do not recommend using this model to make predictions of Earnings per Share.

Test of Joint Significance

H_0: None of the x-variables significantly impact Earnings per Share.

H_A: At least one of the x-variables significantly impacts Earnings per Share.

Because the p-value (Significance F) = 4.67E-71 is less than the significance level of 0.05, we can reject the null hypothesis and can conclude that the model is statistically significant overall, meaning that the three x variables being tested can collectively explain a meaningful portion of the variation in EPS.

Earnings Before Tax Individual Significance Test

H_0: Earnings Before Tax does not significantly impact Earnings per Share.

H_A: Earnings Before Tax does significantly impact Earnings per Share.

Because the p-value = 1.98E-29 is less than our 0.05 significance level, we can reject the null hypothesis and can conclude that Earnings Before Tax does significantly impact Earnings per Share.

As Earnings Before Tax increases by $1 billion, Earnings per Share increases by $0.21/share, on average and all else constant.

Operating Margin Individual Significance Test

H_0: Operating Margin does not significantly impact Earnings per Share.

H_A: Operating Margin does significantly impact Earnings per Share.

Because the p-value is 7.02E-09 is less than our 0.05 significance level, we can reject the null hypothesis and can conclude that Operating Margin does significantly impact Earnings per Share.

As Operating Margin increases by 1 percentage point, Earnings per Share decrease by $0.66/share, on average and all else constant.

Pre-Tax Margin Individual Significance Test

H_0: Pre-Tax Margin does not significantly impact Earnings per Share.

H_A: Pre-Tax Margin does significantly impact Earnings per Share.

Because the p-value is 0.3802 is more than our 0.05 significance level, we fail to reject the null hypothesis and can conclude that Pre-Tax Margin does not significantly impact Earnings per Share.

As Pre-Tax Margin increases by 1 percentage point, Earnings per Share decrease by $0.009/share, on average and all else constant.

Recommendation

Based on the regression results, Earnings before Tax and Operating Margin are statistically significant predictors of Earnings per Share. Due to this relationship, we recommend looking into companies with higher Earnings before Tax, while avoiding companies with higher Operating Margins to maximize potential Earnings per Share. Given the standard error of 4.278 and R^2 of 0.1974, it is important to remember that this model gives us limited accuracy as it only represents roughly 20% in Earnings per Share variation.

Conclusion

In this analysis, we examined the relationship between key financial variables of 1,501 companies listed on the NYSE. The regression results concluded that Earnings before Tax, and Operating Margin significantly impact Earnings per Share, while Pre-Tax Margin does not. Based on these findings, we recommend focusing on companies with higher Earnings before Tax, while avoiding companies with higher Operating Margins to maximize potential Earnings per Share.

Although this model provides some useful insight into the relationship between different key financial variables, it is important to acknowledge the shortcomings, as the R^2 value of 0.1974 shows that it has limited accuracy for future predictions. Future analysis could investigate bigger datasets of financial data that include 20-30+ years of financials. This could normalize the R^2 value and perhaps provide better insights into the long-term effects of the x-variables on the Earnings per Share.

Please feel free to contact me at jakemoore@arizona.edu if you have any questions or would like to discuss these recommendations in more detail.

Technical Appendix

Figure 1 – Regression Output

SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.444261426
R Square	0.197368215
Adjusted R Square	0.195759734
Standard Error	4.278228517
Observations	1501

ANOVA					
	df	***SS***	***MS***	***F***	***Significance F***
Regression	3	6737.683639	2245.894546	122.7047582	4.66736E-71
Residual	1497	27399.94915	18.30323924		
Total	1500	34137.63279			

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	4.213853812	0.159625592	26.39835973	2.0861E-126	3.900740243	4.526967382
Earnings Before Tax	2.13343E-10	1.85374E-11	11.5088228	1.97803E-29	1.76981E-10	2.49705E-10
Operating Margin	-0.066436123	0.011407448	-5.823925252	7.02315E-09	-0.088812401	-0.044059845
Pre-Tax Margin	-0.009490922	0.010812474	-0.877775205	0.380206574	-0.03070013	0.011718286
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Figure 2 – Descriptive Statistics

Earnings Before Tax		***Operating Margin***		***Pre-Tax Margin***		***Earnings Per Share***	
Mean	2458851498	**Mean**	18.11858761	**Mean**	17.66489007	**Mean**	3.367048634
Standard Error	156212583.9	**Standard Error**	0.522032827	**Standard Error**	0.546819459	**Standard Error**	0.123134776
Median	971000000	**Median**	15	**Median**	14	**Median**	2.83
Mode	872000000	**Mode**	10	**Mode**	10	**Mode**	3.01
Standard Deviation	6052103718	**Standard Deviation**	20.22498276	**Standard Deviation**	21.18528483	**Standard Deviation**	4.770578776
Sample Variance	3.6628E+19	**Sample Variance**	409.0499276	**Sample Variance**	448.8162931	**Sample Variance**	22.75842186
Kurtosis	53.92069227	**Kurtosis**	173.5713213	**Kurtosis**	155.2188955	**Kurtosis**	47.92953118
Skewness	6.034273877	**Skewness**	10.28526449	**Skewness**	9.955455049	**Skewness**	0.51064364
Range	1.06952E+11	**Range**	437	**Range**	442	**Range**	111.29
Minimum	-28226000000	**Minimum**	0	**Minimum**	0	**Minimum**	-61.2
Maximum	78726000000	**Maximum**	437	**Maximum**	442	**Maximum**	50.09
Sum	3.69074E+12	**Sum**	27196	**Sum**	26515	**Sum**	5053.94
Count	1501	**Count**	1501	**Count**	1501	**Count**	1501
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