Dividend Policy: Determining the Relevancy in Three U.S. Sectors

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The purpose of this research is to assess the relevance of the dividend policy for thirty U.S. firms in each of the Industrial, Healthcare, and Energy sectors. The Dividend Irrelevance Theory was the applied theoretical framework throughout the duration of the study. Annual dividend and stock price data were collected for the thirty companies in each of the three sectors, from 2001 to 2013. This provided us with 390 observations for each sector. Correlation and regression analysis were applied to further examine the relationship between dividends and stock prices. The findings indicate that there is a statistically significant relationship between stock prices and dividend policy. Thus, these findings provide empirical evidence against the Dividend Irrelevance Theory and provide empirical evidence in support of the Dividend Relevance Theory.

INTRODUCTION

Potential investors, in addition to corporations, can find the value of a firm using several different valuation techniques. According to Magni (2010, p. 233), a "firm's value is given by the sum of the present value of forecasted cash flows". However, citing Modigliani and Miller (1961) as a basis, many practitioners prefer to discount the potential dividends instead. Therefore, with this study, we attempt to assess the relationship between dividends and stock prices. There have been minimal amounts of studies that have been done in this topic area. Furthermore, an even smaller amount of the studies that have been done, have focused on firms that have headquarters in the United States. In addition, many of these aforementioned studies have examined companies on a very broad basis; most commonly it has been an across the board examination. Thus, this study will then focus on companies that have headquarters within the United States, and are a part of the Industrial, Healthcare, and Energy sector.

The primary purpose of this research is to determine whether dividends positively or negatively influence the stock prices of the firms in the previously mentioned sectors. The research question being examine is two-fold, is there a significant relationship between dividends and stock prices? If so, to what extent is that relationship? The Miller and Modigliani Dividend Irrelevance Theory will be used as the framework for this study. When using the assumptions set forth by the Dividend Irrelevance Theory,

dividend policy does not seem to affect stock prices. However, if we were to relax these same assumptions, the theory does not seem to hold.

LITERATURE REVIEW

Dividend Irrelevance Theory

In 1961, Merton Miller and Franco Modigliani introduced the 'Dividend Irrelevance Theory' to the field of Finance. Overall, this theory states that dividends are irrelevant and have no effect on stock prices. In proposing this theory, Miller and Modigliani (1961) laid out three main assumptions, which are highlighted below:

1. Capital markets are perfect, in which no individual person can influence prices through transactions. In addition, all potential investors have equal access to all information, public or private, that may influence a firm's stock price.
2. Investors all exhibit behavior that can be deemed rational, meaning they prefer an increase in wealth regardless if it is dividend income or capital gains.
3. Investors have perfect certainty, implying that complete assurance from investors as to the future cash flows generated by the firm.

Therefore, with these set of assumptions in place, the share price should be equal to the sum of anticipated dividends and the capital gain for the period dividend by the initial purchase price of the stock (McGowan, 2005, p. 121; Miller & Modigliani, 1961, p. 412). According to McGowan (2005, p. 122), Miller and Modigliani argue that all prices must be the same, otherwise there is an arbitrage opportunity available, in which those shares that are overvalued can be sold and those shares that are undervalued can be purchased until the prices reach an equilibrium again. Next, Miller and Modigliani show that the sources and uses of funds must be equal. A firm only has funds created from current operations as well as the sale of new shares (McGowan, 2005, p. 122). The firm then has two uses for these funds, retaining the funds for investments or making dividend payments. Thus, Miller and Modigliani show that the value of a firm is irrelevant to the dividend payments, and the real value is created from potential investment opportunities, not rewarding the shareholders in present time (McGowan, 2005; Miller & Modigliani, 1961).

Dividend Relevance Theory

A competing viewpoint to the theory proposed by Miller and Modigliani is the 'Dividend Relevance Theory', which was first proposed by Myron Gordon and John Lintner. This theory suggests that investors are risk averse and would rather have the dividends today, which would mean that dividend policy and share price should have a direct relationship with each other. To supplement this theory, Gordon and Lintner make the 'bird in the hand argument' as it relates to dividends. This would mean that potential investors see dividends in present day as less risky than dividends or capital gains in the future (Al-Hasan, Asaduzzaman, & Karim, 2013).

Previous Studies

Support for Dividend Relevance Theory

Due to the propositions listed above, many scholars have set out to determine the relationship between dividends and share price. Al-Hasan, Asaduzzaman, and Karim (2013) examined this relationship amongst four industries: Automobile, Cement, Textile, and Pharmacy. The correlation between the two variables was .856, which is significant at the 1 percent level. As a result, the authors found that dividend policy had a significant effect on share price, a finding that seems consistent with the 'Dividend Relevance Theory'.

Zakaria, Muhammad, and Zulkifli (2012) found that there was a positive relationship between the dividend payout ratio and share price volatility amongst Malaysian Construction and Material companies. These results also seem to support the Dividend Relevancy Theory as significant changes in the dividend

payout ratio (change in dividends) leads to overall greater stock price volatility. Profilet and Bacon (2013) investigated the relationship between payout ratio and stock price volatility among 599 companies in the United States. The authors found that there was a positive relationship examined between the firm payout ratio and stock price volatility. This would suggest that dividends do play a role in determining firm value, supporting the Dividend Relevance Theory.

Support for Dividend Irrelevance Theory

Hashemijoo, Ardekani, and Younesi (2012) found results that have not been as consistent with previous studies. When examining Consumer Product companies within the Malaysian stock market, the authors found that the two measurements used to represent dividends, dividend payout & dividend yield, have a negative relationship with stock price volatility. These results are somewhat different from those found in the Zakaria, Muhammad, and Zulkifli (2012) study. Given these two studies examined different areas of the market, the results nonetheless are significant in each aspect. The Hashemijoo, Ardekani, and Younesi (2012) study provides some support for the Dividend Irrelevance Theory as well as the need to examine the relationships within different sectors of the economy.

MODEL

The models used in this study were to determine if changes in the dividends per share influence share price. The basic hypothesis was to determine if there is a statistically significant relationship between the changes in dividends per share and the changes in share price. If there were a relationship, the models would be able to determine whether the relationship was positive or negative.

H_0: *There is not a significant relationship between stock prices and dividends*
H_A: *There is a significant relationship between stock prices and dividends*

Data and Sample Collection

The data utilized in this study were collected over a sample period of 2001 to 2013, which is a period of thirteen years. In this study, the data were collected using secondary sources, such as Yahoo Finance. The sample firms were randomly selected from the three different sectors using a stock screener. The criterion included a stock price greater than 5 dollars in 2013, and the company's headquarters had to be located in the United States. Thirty U.S. firms were then randomly selected from the Industrial, Healthcare, and Energy Sector, which gave us 390 observations per sector.

Variables

In total, there is one dependent variable and one independent variable that were selected for this portion of the study. Market value per share, also known as stock price, was used to represent the dependent variable, while dividends per share were used to represent the independent variables. The definitions of the dependent and independent variables are as follows:

Dependent Variables
Market Value per Share: Stock Price
Independent Variables
Dividends per Share: Annual Dividends / Total Shares Outstanding

METHODOLOGY

In deriving our results, we pooled the data from each sector to give us a sample of 390 observations per sector. In each sector, we treated the market value per share as a single dependent variable and the dividends per share as a single independent variable. For this study, we utilized a correlation analysis and simple regression to determine the extent of the relationship between stock prices and dividends, as well

as determining whether the relationship was statistically significant. We were able to derive one regression equation per sector.

RESULTS AND ANALYSIS

Correlation Analysis Results

TABLE 1
CORRELATION RESULTS – INDUSTRIAL SECTOR, HEALTHCARE SECTOR, & ENERGY SECTOR

	Industrial	Healthcare	Energy
Correlation Coefficient	.707	.148	.450

Table 1 shows the correlation analysis between the stock price and dividend policy in each of the sectors. Overall, we can see that there is a positive association between stock prices and dividends in all three sectors. The strength of the association, however, differs rather significantly as we examine each sector individually. One thing to keep in mind is that the correlation coefficient simply represents the association between the two variables and does not provide an inference that the two have a causal relationship.

The correlation coefficient for the Industrial sector is .707. This coefficient is statistically significant, and represents a strong association between stock prices and dividends. Another way of interpreting this is by observing that stock prices and dividends move in the same direction approximately 70.7 percent of the time. This would suggest that a nominal increase in the dividend per share amount should subsequently result in a positive increase in the stock price. The magnitude of this increase, however, will be measured through a simple regression.

The correlation coefficient for the Healthcare sector is .148. This coefficient is statistically significant, but represents a weak association between stock prices and dividends. Another way of interpreting this is by observing that stock prices and dividends move in the same direction approximately 14.8 percent of the time. This would suggest that a nominal increase in the dividend per share amount should subsequently result in a positive increase in the stock price. The magnitude of this increase, however, will also be measured through a simple regression.

The correlation coefficient for the Energy sector is .450. This coefficient is statistically significant, and represents a moderate association between stock prices and dividends. Another way of interpreting this is by observing that stock prices and dividends move in the same direction approximately 45.0 percent of the time. This would suggest that a nominal increase in the dividend per share amount should subsequently result in a positive increase in the stock price. The magnitude of this increase, however, will also be measured through a simple regression.

Regression Analysis Results

TABLE 2
REGRESSION RESULTS – INDUSTRIAL SECTOR

MVPS = 14.006 + 37.082(DPS)	Adj. R^2 = .499
(7.471)** (19.702)**	F = 388.17****

**t-stat significant at 1%
****f-stat significant at 1%

Table 2 shows the regression analysis between the stock prices and dividends per share in the Industrial sector. We can see that the relationship between the two variables is indeed positive, which can also be confirmed by the correlation coefficient. The regression equation shows that firms in the Industrial sector would have an average stock price of $14.01 if they paid a dividend of $0. When paying dividends, however, these same firms would see their stock price increase. In fact, a 10-cent increase in the dividend would result in a $3.71 increase in the stock price. The coefficients for the intercept and the dividends per share are statistically significant at the 1 percent level. In addition, the adjusted R^2 suggests that nearly 50 percent of the variation in stock prices can be explained explicitly by the dividend policy. The remaining 50 percent, however, is explained by other factors. Since this model is statistically significant, there is no evidence to accept the null hypothesis.

TABLE 3
REGRESSION RESULTS – HEALTHCARE SECTOR

MVPS = 41.463 + 5.888(DPS)	Adj. R^2 = .019
(22.008)** (2.950)**	F = 8.70****

**t-stat significant at 1%
****f-stat significant at 1%

Table 3 shows the regression analysis between the stock price and dividends per share in the Healthcare sector. We can see that the relationship between the two variables is indeed positive, which can also be confirmed by the correlation coefficient. The regression equation should that firms in the Healthcare sector would have an average stock price of $41.46 if they were to pay a $0 dividend. When paying dividends, however, these same firms would see their stock price go up. In fact, a 10-cent increase in the dividend would result in a $.59 increase in the stock price. The coefficients for the intercept and the dividends per share are statistically significant at the 1 percent level. The adjusted R^2, however, suggests that only 2 percent of the variation in the stock price can be explained explicitly by the dividend policy. Since the model is statistically significant, there is also no evidence to accept the null hypothesis.

TABLE 4
REGRESSION RESULTS – ENERGY SECTOR

MVPS = 39.978 + 12.211(DPS)	Adj. R^2 = .200
(26.271)** (9.924)**	F = 98.49****

**t-stat significant at 1%
****f-stat significant at 1%

Table 4 shows the regression analysis between the stock prices and dividends per share in the Energy Sector. We can see that the relationship between the two variables is indeed positive, which can also be confirmed by the correlation coefficient. The regression equation shows that firms in the Energy sector would have an average stock price of $39.98 if they paid a dividend of $0. However, when paying dividends, these same firms would see their stock price go up. In fact, a 10-cent increase in the dividend would result in a $1.22 increase in the stock price. The coefficients for the intercept and dividends per share are statistically significant at the 1 percent level. In addition, the adjusted R^2 suggests that 20 percent of the variation in stock prices can be explained explicitly by the dividend policy. The remaining 80 percent, however, is explained by other factors. Since this model is statistically significant, there is no evidence to accept the null hypothesis.

DISCUSSION

Based on the results from the correlation analysis and regression analysis, we can see that there seems to be a statistically significant relationship between stock prices and dividends in all three sectors, which also happens to be positive. Using the assumptions outlined by Miller and Modigliani, we can also make some inferences about these three sectors. First, since the results indicate that there is a relationship between stock prices and dividend policy, there may be some evidence that suggests that the markets that represent these three sectors are not perfect, and that all pertinent information is not currently reflected in the stock prices. Second, one could make the argument that investors within the Industrial and Energy sectors are not rational, and that many of these same investors prefer current dividends rather than future dividends and capital gains. This would provide some evidence in support of the "bird in hand" argument that was proposed by Gordon and Lintner. Third, these results might suggest that there is indeed uncertainty in the future cash flows that will be generated by firms in the Industrial and Energy Sector, thus explaining why investors would want to receive present day dividends instead. Considering what has been happening in the Oil industry, this inference certainly makes sense for the Energy sector.

In all, these results indicate that firms in the Industrial and Energy sectors could revisit their dividend policy if they wish to increase stock prices and fully achieve the goal of maximizing shareholder wealth. In fact, firms in the Industrial sector may want to strongly consider moving around resources to free up some cash to increase dividends, primarily because the dividend policy accounts for 50 percent of the variation in the stock prices. Since the dividend policy only accounted for 2 percent of the variation in the Healthcare sector, however, firms in this sector have no reason the revisit their dividend policy. In fact, these same firms might even consider not paying a dividend, and instead put the capital toward other business operations, primarily because investors in this industry do not seem to care about dividends and would rather prefer future capital appreciation.

ADDITIONAL RESEARCH

Due to the importance of this topic, there is additional research that could be done to further enhance the analysis. Future research could include adding various economic and financial variables to see how they coincide with dividend policy and stock prices. Since the primary goal of a public company should be to maximize shareholder wealth, having a better understanding of which variables have the most impact on share price will enable these companies to fully achieve the wealth maximization precedent that has already been set. In addition, these results suggest that the capital markets are not efficient. Fama, who first developed the Efficient Market Hypothesis, has also shifted towards markets not being completely efficient. As a result, the Adaptive Market Hypothesis has been introduced, which primarily focuses on behavioral finance and economics.

CONCLUSION

In conclusion, this study investigated the relationship between stock prices and dividend policy. We reject the null hypothesis in all three sectors, and conclude that there is a statistically significant relationship between firm value and dividend policy amongst the Industrial, Healthcare, and Energy sectors in the United States. In addition, these results seem to provide some support for the Dividend Relevance Theory proposed by Gordon and Linter, while simultaneously providing empirical evidence against the Dividend Irrelevance Theory proposed by Miller and Modigliani. An important thing to remember, however, is that we have not definitively concluded anything. We have merely found that stock prices seem to have a direct relationship with the dividend policy implemented by the sectors used in this study. Thus, we have found some evidence to suggest that dividends are relevant in determining firm value.

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