Returns of Dividend vs. Non-Dividend-Paying Stocks and Their Relations With Financial Distress and Market Risk Measures

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Abstract

This study investigates whether risks and returns of dividend-paying stocks differ from non-dividend-paying stocks. It also examines the financial health and market risk exposure of dividend vs. non-dividend paying firms. The descriptive statistics show that average risks and return of non-dividend paying stocks are higher than dividend-paying stocks. However, tests of equality of means and variances fail to support the conventional view that dividend paying stocks' returns and risks differ from non-dividend paying stocks over time. The Altman financial stress test shows that the average Z-score of non-dividend-paying stocks is higher and is more volatile than non-dividend paying firms. However, the results strongly reject the argument that dividend and non-dividend paying firms are equally exposed to financial risks. Furthermore, the tests of equality of mean and variance of market risk of dividend paying vs. non-dividend paying stocks are strongly rejected.

I. Introduction

Previous studies have shown conflicting results as to whether dividend payout actually affects stock prices and stock returns. Among arguments that dividend paying stocks have higher and stable returns are that dividends represent an assured income relative to an unsure capital gain. A consistent dividend payment enhances share values and leads to higher investment returns. Some argue investing in non-dividend paying stocks should be an exception and not the rule because returns of dividend–paying stocks outperform non-dividend paying stocks and historically are less volatile. Some studies support Miller and Modigliani's (1961) classic dividend irrelevance theory [e.g., Black and Scholes (1974), Miller and Scholes (1978), Jose and Stevens (1989), Reza Rahgozar (2008)]); others do not [e.g., Long (1978), Sterk and Vandenberg (1990)]. Graham and Dodd (1934) argue that the primary purpose of a business corporation is to pay dividends to its owners. Lintner (1962) shows by setting a high dividend payout ratio a firm's value maximizes (Bird-in-the-Hand Theory). When dividends are increased or initiated, prices tend to go up, and when dividends are cut or omitted, prices fall leading to lower investment returns. The survey research by Farrelly, Baker, and Edelman (1985) shows that corporate managers believe that dividend policy affects a firm's value. Baker and Powell (1999) in the survey of corporate managers found that most managers believed that dividend policy affects firm value. Hussainey, Mgbame, and Chijoke-Mgbame (2011), using firms listed in the London Stock Exchange, found positive relationships between dividend yield and stock prices and concluded that changes in dividend policy is relevant in determining share values and investment returns. Burlacu, Fontaine, Jimenez, and Seasholes (2012) in a study of the relationships between expected returns and risk faced by investors, show why some stocks have high average returns while others have low average returns. Chang, Christoffersen, and Jacobs (2013) find that stock returns have substantial exposure to higher market risk. Stocks with high exposure to volatility exhibit somewhat higher returns on average. Pastor and Stambaugh (2012), in spite of conventional wisdom that stock returns are less volatile over longer investment horizons, find that stocks are actually more volatile over long horizons. They conclude that long-horizon stock investors face more volatility than short-horizon investors.

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The question of whether the financial health of firms affects dividend payments and investment returns are of interest to many investors. Weakening financial health can adversely affect stock prices and dividend income and it would consequently lead to lower investment returns. Beaver (1966) and Altman (1968) have developed the "Z-score" model that helps to predict financial failures of companies. The Z-score measures how closely a firm resembles other firms that have failed due to bankruptcy. Numerous studies have shown evidence of the effectiveness of Altman's Z-score in predicting corporate financial distress (e.g., Wang and Campbell 2010, Lugovskaya 2010, Gerantonis, et. al (2009), Xu and Zhang 2009). In addition, Begley et. al (1996) indicated that the Altman Z-score model provides more accurate prediction for U.S. companies in certain periods than others. Likewise, Grice and Ingram (2001) find that the Z-score performs well in predicting financial distress of manufacturing companies.

The main objectives of this study are to test (1) Do returns and risks of dividend-paying stocks differ from non-dividend paying stocks over time? (2) Which group of stocks is more susceptible to market risk and its volatility? (3) Are dividend-paying firms under lower financial stress than non-dividend paying firms? The remainder of this paper includes the following sections. Section II describes the data and methodology and section III discusses empirical findings. Conclusions and implications of the study appear in Section IV.

II. Data and Methodology

Data was obtained from Compustat. The sample includes all firms in the Standard & Poor's 500 Index from 1995-2012. To prepare data for empirical testing, first all 500 firms in the index were separated into two groups of dividend and non-dividend paying stocks. Then, annual returns for all firms in each group were extracted from the database; firms with missing and incomplete data over the sample period were eliminated. The final data set considered for empirical study includes 350 divided paying and 49 non-dividend paying firms. The stock returns are annualized rates of return reflecting price appreciation plus reinvestment of monthly dividends and the compounding effect of dividends paid on reinvested dividends (Compustat definition). Also, betas for all firms are extracted to examine which group of stocks is more susceptible to market risk and its variations. Furthermore, the Z-score data for all firms included in this study are obtained to evaluate the financial health of dividend vs. non-dividend paying stocks. The descriptive statistics and several statistical tests such as the Satterthwaite-Welch-t-test, Anova F-test, Welch F-test, etc. are employed to test the major objectives of this study. The following Altman (1968) financial stress model is applied to estimate Z-score values:

$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + .999X_5$
Where,
X_1 = Working Capital / Total Assets
X_2 = Retained Earnings / Total Assets
X_3 = Earnings before Interest and Taxes / Total Assets
X_4 = Market Value of Equity / Total Liabilities
X_5 = Sales/ Total Assets
The Altman model predicts firms with Z-scores above 3 are unlikely to file for bankruptcy, firms with Z-scores below 1.81 are predicted to fail, and firms with Z–scores between 1.81 and 3 are considered in the "gray" area.

Variable Definition

DR =Dividend-paying stock return
SDDR =Standard deviation of dividend-paying stock return
DB =Market risk of dividend-paying stock, measured by stock beta
DZ =Z-Score of dividend-paying stock
NDR =Non-dividend-paying stock return
SDNDR =Standard deviation of non-dividend-paying stock return
NDB =Market risk of non-dividend-paying stocks, measured by stock betas
NDZ =Z-Score of non-dividend-paying stock

III. Empirical Findings

Testing the Equality of Means and Variances of Returns of Dividend and Non-dividend Paying Stocks

Figure 1 depicts average returns of dividends vs. non-dividend-paying stocks for the sample over the entire period (1995-2012). Figure 2 illustrates volatility of stock returns measured by standard deviation of returns. As it is apparent from Figure 1, investment returns of dividend (DR) and non-dividend (NDR) paying stocks fluctuate without a clear indication that one group has superior returns relative to the other group. However, Figure 2 clearly shows that returns of non-dividend paying stocks are more volatile and thus are riskier than dividend paying stock returns. The standard deviation of returns of non-dividend paying stocks (SDNDR) has remained above the standard deviation returns of dividend-paying stocks (SDDR) over the entire sample period.

Figure 1 Returns of Dividend vs. Non-dividend Paying Stocks

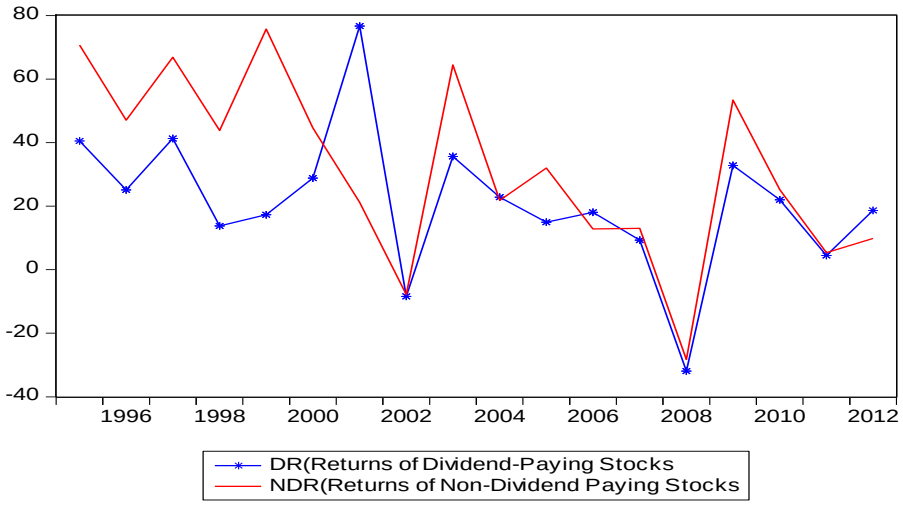

Figure 2 Standard Deviation of Returns of Dividend vs. Non-dividend Paying Stocks

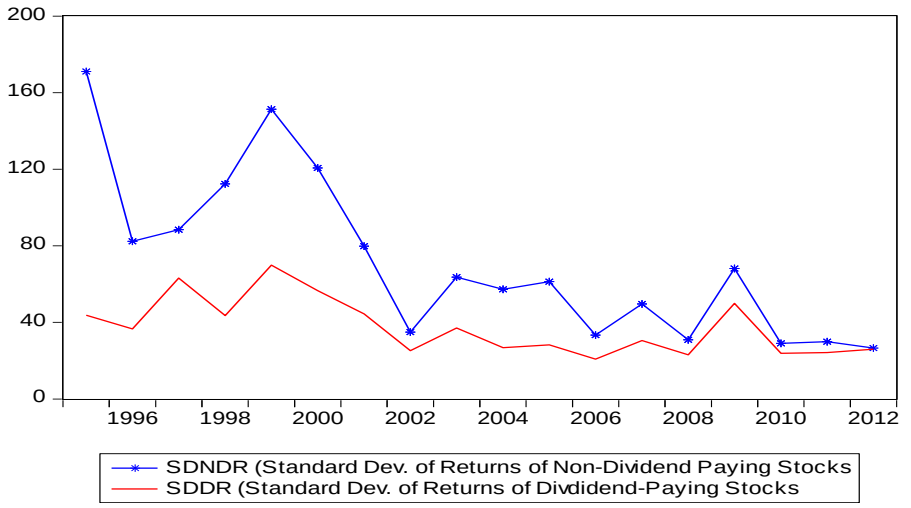

Table 1, Panel A includes descriptive statistics showing the mean and standard deviation of dividend (DR) and non-dividend (NDR) paying stocks. The descriptive statistics appearing in the table show that on average variable DR is lower and is less volatile than variable NDR. Panels B and C include several test results examining whether there is sufficient statistical evidence to conclude that the average return and variance of dividend and non-dividend paying stocks differ over time. The t-test, F-test along with other tests appearing in table 1, all fail to reject the hypothesis that the means of variables DR and NDR are different at the 5 and 10 percent significance levels. Contrary to the general belief, these results fail to support that the risks and returns of dividend paying stocks differ from those of non-dividend paying stock returns.

Table 1 Descriptive Statistics and Tests for Equality of Mean and Variance of Returns of Dividend (DR) and Non-Dividend Paying Stocks (NDR), 1995-2012

Panel A: Descriptive Statistics of Variables DR and NDR

	DR	**NDR**
Mean	21.20	31.75
Std. Dev.	22.38	28.77
Observations	18	18

Panel B: Test for Equality of Mean Returns of DR and NDR

Method	***df***	**t-Value**	**Probability**
t-test	34	-1.228048	0.2279
Satterthwaite-Welch t-test*	32.06140	-1.228048	0.2284
Anova F-test	(1, 34)	1.508101	0.2279

Panel C: Test for Equality of Variances of Variables DR and NDR

Method	**df**	**t-Value**	**Probability**
F-test	(17, 17)	1.652157	0.3102
Levene	(1, 34)	2.706353	0.1092
Brown-Forsythe	(1, 34)	2.644937	0.1131

Note: DR and NDR are annual returns of dividend and non-dividend paying stocks. The Satterthwaite-Welch t-test is an adaptation of the Student's t- test intended for use with two samples having possibly unequal variances. Levene's test is used to assess the equality of variances in different samples. The Brown–Forsythe test is a statistical test for the equality of group variances based on performing an ANOVA on a transformation of the response variable.

Testing Market Risk Exposure of Dividend and Non-Dividend-Paying Stocks

Table 2, Panel A displays the mean and standard deviation of market risk of dividend (DB) and non-dividend (NDB) paying stocks. The tests of the equality of means and variances of variables DB and NDB appear under Panel B and C respectively. The descriptive statistics in Table 2 show that the average market risk of dividend paying stocks (DB) slightly differs from non-dividend paying stocks (NDB) but its variance is notably lower. However, test results appearing under Panels B and C strongly refute the hypothesis that the mean and variance of variables DB and NDB are equal at the 5 and 10 percent significance levels. These results strongly support the hypothesis that non-dividend paying stocks' exposures to market risk are different and possibly higher than dividend-paying firms. As is shown in Table 2, the standard deviation of market risk (beat) of non-dividend-paying stocks (NDB) is higher than dividend-paying firms (DB).

Table 2 Descriptive Statistics and Tests of Equality of Means and Variances of Market Risks (beta) of Dividend vs. Non-Dividend Paying Stocks, 1995-2012

Panel A: Descriptive Statistics of Variables DB and NDB

	DB	NDB
Mean	1.1426	1.1406
Std. Dev.	0.0274	0.0611

Panel B: Test for Equality of Means of DB and NDB

Method	df	t-Value	Probability
t-test	38	-7.546179	0.0000
Satterthwaite-Welch t-test*	31.4622	-7.546179	0.0000
Anova F-test	(1, 36)	56.94482	0.0000
Welch F-test*	(1, 31.4622)	56.94482	0.0000

Panel C: Test for Equality of Variances of DB and NDB

Method	df	t-Value	Probability
F-test	(19, 19)	2.675443	0.0378
Levene	(1, 38)	4.079374	0.0505
Brown-Forsythe	(1, 38)	2.817621	0.1014

Note: DB and NDB represent beats (measure of market risk) of dividend and non-dividend paying stocks. The Satterthwaite-Welch t-test is an adaptation of the Student's t- test intended for use with two samples having possibly unequal variances. Levene's test is used to assess the equality of variances in different samples. The Brown–Forsythe test is a statistical test for the equality of group variances based on performing an ANOVA on a transformation of the response variable.

Testing the Financial Health of Dividend and Non-Dividend Paying Stocks

Figure 3 illustrates the Altman (1968) financial stress test measured by Z-score of the dividend–paying (DZ) vs. non-dividend paying (NDZ) firms. The graph clearly shows that the average Z-score of non-dividend paying stocks is above the dividend paying firms and is more volatile over time.

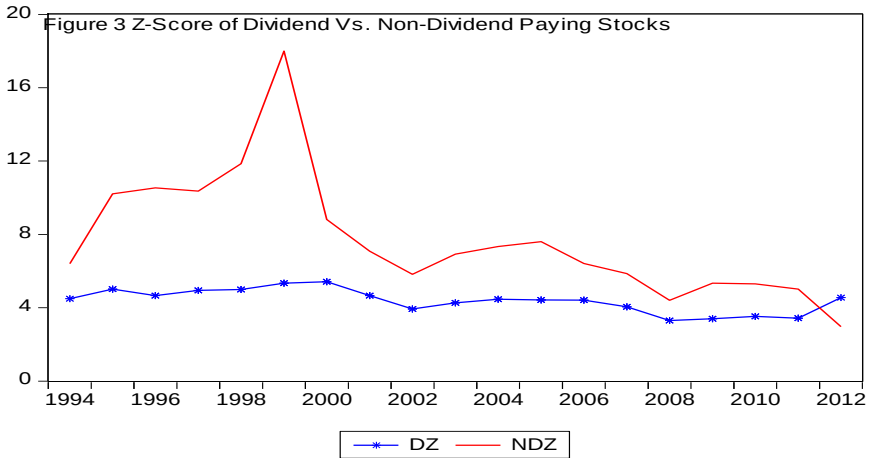

Table 3 Descriptive Statistics and Tests for Equality of Mean and Variance of the Financial Strength Measure Z-Score of Variables DZ and NDZ, 1995-2012

Panel A: Descriptive Statistics of Variables DZ and NDZ

	DZ	NDZ
Mean	4.38	7.70
Std. Dev.	0.64	3.41
CV	0.15	0.44

Panel B: Test for Equality of Means of DZ and NDZ

Method	df	Value	Probability
t-test	36	-4.164548	0.0002
Satterthwaite-Welch t-test*	19.26	-4.164548	0.0005
Anova F-test	(1, 36)	17.34346	0.0002
Welch F-test*	(1, 19)	17.34346	0.0005

*Test allows for unequal cell variances

Panel C: Test for Equality of Variances DZ and NDZ

Method	df	Value	Probability
F-test	(18, 18)	28.41088	0.0000
Levene	(1, 36)	14.20233	0.0006
Brown-Forsythe	(1, 36)	9.613144	0.0037

Note: Note: DZ and NDZ are measures of financial health of dividend and non-dividend paying firms. Please also see notes under tables 2 and 3.

Table 3, Panel A, B, and C include descriptive statistics, and tests of equality of means and variances of Z-score of the dividend (DZ) and non-dividend (NDZ) paying stocks. Panel A in Table 3 shows the average Z-score of variables DZ and NDZ are both above the Altman's criteria of number 3, "unlikely to file for bankruptcy." However, the higher standard deviation of variable ZND (3.41) compared with variable ZD (0.64) signifies a greater financial instability among non-dividend paying vs dividend paying stocks. Such financial volatility among non-dividend paying stocks is also supported by the coefficient of variation (CV) appearing in Table 3 showing that variable ZND has relatively higher CV than variable ZD, 0.44 and 0.15 respectively.

Panel B and Panel C in Table 3 presents tests of the equality of means and variances of variables DZ and NDZ. All tests appearing in the table strongly reject the hypothesis that means and variances of the Z-score of dividend and non-dividend paying stocks are equal at the 1 percent significance level. The rejection of the equality of means and variances of variables DZ and NDZ implies that financial strength and volatility of dividend and non-dividend paying firms are dissimilar.

The Altman's financial stress model considers three criteria of unlikely to file for bankruptcy, predicted to fail, and the grey area for categorizing financial health of firms. Among the 350 dividend paying firms included in this study 61, 19, and 20 percentages of firms fell into the three financial stress criteria respectively. Whereas, among the 49 non-dividends paying firms considered 77, 6, and 17 percentages fell into the three zones of the financial stress categories. Because of the data limitation, test results appearing in Table 3 only use average Z-score of all dividends and non-dividend paying stocks to compare their financial strength level without separating them into three categories of financial stress zones.

IV. Conclusion

This study investigated whether risks and returns of dividend-paying stocks differ from non-dividend-paying stocks. It also examined the financial health and market risk exposure of dividend vs. non-dividend paying firms. The sample included data for all firms in the Standard & Poor 500 Index having complete data needed for this study during the 1995-2012 periods. Firms with missing and incomplete dividend data over the sample period were excluded from empirical analysis. The descriptive statistics show that although average risk and return of non-dividend paying stocks exceed dividend-paying stock, tests of equality of means and variances do not support the conventional view that dividend paying stocks' risks and returns are different from non-dividend paying ones.

Using Altman (1968) financial stress criteria, the test results revealed that there are strong differences between the financial strength of dividend-paying stocks vs. non-dividend paying stocks. The test results showed that the volatility of the Z-score of dividend paying stocks was lower than non-dividend paying firms. Such financial stability would possibly allow dividend paying firms to follow a more disciplined and consistent dividend payout policies. However, the results do not support the hypothesis that on average non-dividend paying stocks are under higher financial stress than dividend-paying stocks.

The Descriptive statistics showed that although average market risk of dividend and non-dividend paying stocks, measured by beta, were almost the same, their standard deviations were different. Furthermore, the tests of equality of means and variances strongly revealed that exposures of dividend and non-dividend paying stocks to market risks are dissimilar.

The implication of this study is that although there is no statistical support that investment returns of dividend paying stocks exceed non-dividend paying stocks, their financial strength and exposures to market risks are dissimilar. Dividend paying stocks, on average, are financially stronger than non-dividend paying firms and have lower market risk exposures. The results and conclusion of this study might differ due to the sample size, stocks considered, and study period.

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