Why some companies pay dividends, some companies don’t?

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Contents

Introduction

The purpose of this thesis is to explain why some companies pay dividend while others do not. Investors normally view the dividend payments as a sign that the management's confidence in future earnings growth. On the other hand, some companies choose not to pay dividends to its shareholders so that they can reinvest the earnings to increase the value of company. To illustrate why a company choose to pass its earnings on as dividend, a probit model is used including the following five variables: industry, size, growth rate, D/E ratio, and profit margin.

The distinctive characteristics of each industry can explain whether a company choose to pay dividends. Companies within particular industries are more likely to pay dividends. According to the North American Industry Classification System (NAICS) 2017, industries are divided into six categories: Information, Finance& Insurance, Manufacturing, Real Estate& Rental& Leasing, Wholesale& Trade and others.

[Table 1 is about here]

The size of a company is also considered a factor. Typically small companies can have more growth opportunities, while large companies are more likely to dominate the market. It is therefore difficult to interpret the effect of a company's size on its dividend payout policy. The market capitalization is used as a proxy of the company size, which is calculated as the number of shares outstanding at the end of each month multiply by the monthly closing price.

A company with more growth opportunity usually choose to retain its earnings so as to reinvest its earing as much as possible. The revenue growth rate is used as a proxy of the company's growth rate. A higher growth rate indicates that a firm has relatively more potential growth opportunity. The revenue growth rate is calculated as following:

$$g_t = \frac{Rev_t}{Rev_{t-1}} - 1$$

The debt-equity ratio, to some extent, reflects a company's ability to pay dividends payout. A relatively low debt to equity ratio indicates that a firm is in a sound financial position and is not burdened by its interest payment.

A relatively high profit margin ratio indicates that a firm's strong ability to generate a steady cash flow stream from operations to make a dividend payment. The profit margin is calculated as following:

$$ProfitM_t = \frac{NI_t}{Rev_t} * 100$$

Data

The data is obtained from the COMPUTESTAT database via the WRDS database. The initial sample is composed of quarterly data of all available companies included in the COMPUSTAT database over the period from the first quarter of 2001 to the last quarter of 2016.

First, the COMPUTSTAT database does not provide data of shareholder's equity of most companies preceding 2009. Secondly, the financial crisis happened in 2008 may have an influence on a company's dividend payment decision. Thirdly, a large number of companies have not released their financial information for the last quarter of 2016. Hence, the final sample period is from the first quarter of 2010 to the third quarter of 2016.

To be included in the final sample, a company is required to have no missing values on any variables included in the probit model. In addition, I calculate the total cash dividend payment of each company over the sample period, to define whether a company is dividend-paying company. A company is considered a dividend-paying company if the total cash dividends payment is greater than zero.

As a result, the final sample is composed of the quarterly data of 566 companies over the period from the first quarter of 2010 to the third quarter of 2016, of which 468 are dividend-paying companies and 98 are non-dividend-paying companies.

Methodology & Results

The Probit model is used to estimate the probability of each observation with specific characteristic will fall into each of the binary dependent variable (1 or 0). y_i is a latent variable and the model is defined as following:

$$y_i = X'\beta + \varepsilon_i \; where \; \varepsilon_i \rightarrow N(0, \delta)$$

$$if \; Y = \begin{Bmatrix} 1 & y_i > 0 \\ 0 & otherwise \end{Bmatrix} = \begin{Bmatrix} 1 \\ 0 \end{Bmatrix}$$

$$Pr(Y = 1) = \Phi \; (X'\beta)$$

$$Pr(Y = 0) = 1 - \Phi \; (X'\beta)$$

The dependent variable, Y, is equal to 1 if the company is a dividend-paying company, otherwise zero (i.e. The company is a non-dividend paying company). Using the Maximum Loglikelihood Estimation, we obtained the β parameters and P-Value. The β coefficient estimates illustrate the marginal effect of independent variables on the probability of whether a company pays dividend. Using a 5% significance level, the results are shown in Table2.

[Table 2 is about here]

We construct the following hypothesis tests to examine if the dependent variable, whether a company pays dividend, can be explained by each independent variable, factor *i*.

$$H_0: \beta_i = 0$$

$$H_1: \beta_i \neq 0$$

The P-value of industry equals 0.0011, which is less than 0.05. I do not reject the null hypothesis, and conclude that the β estimate of industry is significantly different from zero at 5% significance level. As $\beta = -0.0488$, it indicates a negative marginal effect, means if the category variable increase by one, the probability for the company within industry to pay dividends will decrease by 0.0488.

The P-value of size is less than 0.0001. Again, I reject the null hypothesis and conclude that the β estimate of size is significantly different from zero at 5% significance level. It indicates a positive marginal effect on company paying dividends. If the company increase its size by an infinitesimal amount, the probability for the company paying dividends will increase by 0.0001.

The P-value of growth rate equals 0.8960, which is greater than 0.05. I fail to reject the null hypothesis and conclude that the β estimate of growth rate is not significantly different from zero at 5% significance level.

The P-value of D/E ratio equals 0.3712, which is greater than 0.05. I fail to reject the null hypothesis and conclude that the β estimate of D/E ratio is significantly different from zero at 5% significance level.

The P-value of profit margin is less than 0.0001. I do not reject the null hypothesis, and conclude that the β estimate of profit margin is significantly different from zero at 5% significance level. As $\beta = 0.0115$, it indicates a positive marginal effect on company paying dividends. If the company increase its profit margin by an infinitesimal amount, the company will increase its probability of paying dividends by 0.0115.

Since the intercept is significantly different from 0 at 5% significance level, indicating that there are other factors (except the independent variables included in the model) that might affect a company's dividend payout policy.

Conclusion

In conclusion, numerous explanations regarding whether a company pays dividend have been provided so far. In this paper, I use a probit model to find the factors that can explain whether a company pays dividend. It seems that industry, size, and profit margin have an influence on a company's dividend payout decision, while D/E ratio and growth rate do not. The intercept is also significantly different from zero, indicating the probit model does not capture all the possible factors that can affect a company's dividend payout decision, which the future studies can continue to explore.

Appendix A

Table 1

Category	Industry	NAICS	Number of Observation
1	Information	51	38
2	Finance& Insurance	52	69
3	Manufacturing	31,32,33	257
4	Real Estate& Rental& Leasing	53	32
5	Wholesale& Retail Trade	42,44,45	58
6	Others	Others	112
	Total	NA	566

Table 2

Parameter	Estimate	Standard Error	Chi-Square	Pr>ChiSquare
Intercept	1.0550	0.0635	275.98	<0.0001
Industry	-0.0488	0.0149	10.73	0.0011
Size	0.0001	0.0000	540.17	<0.0001
Growth Rate	-0.0042	0.0319	0.02	0.8960
D/E Ratio	0.0003	0.0004	0.80	0.3712
Profit Margin	0.0115	0.0016	49.41	<0.0001

Appendix B

SAS Codes:

```
libname Orion 'I:\mscm504ass2';
data begin1 begin2 (keep=GVKEY rename=(GVKEY=ID));
      set Orion.data;
      retain NewID;
      Size = CSHOQ*PRCCQ;
      Growth = REVTY/lag1(REVTY) - 1;
      DERatio = DLTTQ/TEQQ;
      ProfitM = NIQ/REVTY*100;
      if NewID NE GVKEY then do;
      count = 0;
      NewID = GVKEY;
      end;
      Count + 1;
      output begin1;
      if count = 68 then output begin2;
run;

proc sql;
create table begin3 as
  select a.GVKEY, a.DataDate, a.TIC, a.CONM, a.NAICS, a.Size, a.Growth,
a.DERatio, a.ProfitM, a.count, a.DVY
   from begin1 as a, begin2 as b
    where a.GVKEY=b.ID and 41 LE count LE 67;
quit;

data begin4;
      set begin3;
            if Size = . then delete;
                  else if Growth = . then delete;
                        else if ProfitM =. then delete;
                              else if DERatio = . then delete;
                                    else if DERatio = 0 then delete;
      drop count;
run;

data begin5 begin6(keep=GVKEY TOT_DVY rename=(GVKEY=ID));
      set begin4;
      retain NewID;
      if NewID NE GVKEY then do;
      count = 0;
      TOT_DVY = 0;
      NewID = GVKEY;
      end;
      Count + 1;
      TOT_DVY +DVY;
      output begin5;
      if count = 27 then output begin6;
run;

data begin7;
      set begin6;
            if TOT_DVY = 0 then DividendPay = 0;
                  else DividendPay = 1;
```

```
run;
data begin8;
      set begin5;
            Code = substr(NAICS,1,2);
            if Code = '51' then industry = 1;
            *Information;
            else if Code = '52' then industry = 2;
            *Finance & Insurance;
            else if Code in ('31', '32', '33') then industry = 3;
            *Manufacturing;
            else if Code = '53' then industry = 4;
            *Real Estate abd Rental and Leasing;
            else if Code in ('42', '44', '45') then industry = 5;
            *Wholetrade & Retail Trade;
            else industry = 6; *Others;
run;

proc sql;
create table orion.final as
  select a.GVKEY, a.DataDate, a.TIC, a.CONM,a.industry, a.Size,
  a.Growth, a.DERatio, a.ProfitM, b.Dividendpay
   from begin8 as a, begin7 as b
    where a.GVKEY=b.ID;
quit;


title '1 for paydidvidend and 0 for nopay';
proc freq data=begin7;
tables dividendpay /nopercent;
run;
title;

title 'The number of firms in each industry category';
proc sort data=orion.final out=industry;
by GVKEY;
run;

data industry;
      set industry;
            by GVKEY;
            if last.GVKEY;
run;

proc freq data=industry;
      tables industry /nopercent;
run;
title;


proc probit data=orion.final;
      model Dividendpay (event='1') = industry Size DERatio Growth
ProfitM /Dist=logistic;
run;
```