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Determinants of corporate dividend decision in China: An application of the panel data model

In Partial Fulfillment of the Requirements
for the Bachelor of Science in Accounting

by

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May, 2020

Abstract

Dividend decisions have been a contentious issue between company managers and shareholders. In this study, the author attempts to identify the determinants of dividend policy for Chinese financial industry companies. From 2014 to 2018, the panel data of 61 companies were analyzed using fixed and random effects technology. The results show that the company's profitability scale and risk are significant determinants affecting the dividend policy of Chinese financial companies. ROA and EPS in profitability are negatively correlated with dividend decisions. This is an unexpected result. The correlation between several other agency variables and dividend decisions is supported by agency cost theory.

Key Words: Dividend Policy; Determinates; china; Dividend Decision; Panel Model

I. Introduction

Dividend policy has always been the most controversial topic, and it has a prominent position in the literature. Many researchers have participated in this topic to conduct research, design theory, create models, and provide a reference for dividend payment decisions. However, there is no answer to the optimal dividend decision. Different regions, different industries, and different systems all affect the value of a company. Former researchers did not really find the factors driving dividends. At the same time, it is impossible for researchers to completely find the interaction between key factors. Dividend theory and factors are constantly changing and breaking down, which has also become the source of attracting researchers to explore this topic

The question that the author wants to explore is what are the key factors affecting the dividend decision of Chinese financial industry companies? What are these key factors and what are the most important? What is the positive and negative correlation between the key factors explored and the financial company's dividend policy? This series of questions has also been studied and answered by former researchers. Research on dividend policy began with Miller and Modigliani (1961), who believed that dividends are irrelevant in a perfect capital market. Subsequent literature also shows that company dividend policy is related to company value.

Most of the literature studies companies in developed countries, but less in developing countries. In addition, the background of this research's dividend theory will span the era of big data. In the context of rapid economic development, the company's managers and investors are very careful about the choice of dividends or retained earnings. (Glen et al. 1995). The author will select Chinese financial industry companies as the research object and analyze how Chinese financial industry companies will consider the dividend decision in the new era. Are

the key factors affecting dividend decisions different from those in the past? Are their correlations different from past literature? Five surrogate variables considered in this study. The correlation between the company's profitability and dividend decision is not consistent with conjecture. The other proxy variables are as expected. In other literature, ROA and earnings per share in profitability are positively related to dividend decisions. The author explored the opposite. The reasons may be: 1) the observed value of the cross-section of the flat data is confusing; 2) the past dependent variable DY is defined as the ratio of the dividend per share to the price per share. It cannot use the payout ratio as a measure of the dependent variable because the sample includes companies with negative returns (Samy, et al, 2007).

The article is divided into the following parts: section 2 talks about the literature review. Section 3 discusses the hypothesis and proxy variables in the study. Section 4 discusses the data and methodology. Section 5 discusses the results of empirical research. Section 6 expresses the conclusions that have been gotten from the outcomes of the study.

II. Literature Review

The earliest research on dividend decision-making was performed by Lintner, who targeted American companies in the mid-1950s. He concluded that the dividend decision is based on the profitability of the current year and the dividend of the previous year. Since then, the controversy over dividend policy has persisted, with mixed results. In the 1960s and 1970s, scholars put forward many theories to explain dividend policy and the relationship between dividend policy and stock value, among which the most representative are the bird in hand theory, MM dividend irrelevance theory and tax difference theory, which is called traditional

dividend policy theory. Over time, more theories were deduced. Modern agency cost theory, writing theory, etc.

M. Gordon (1959) proposed the bird in hand theory and applied it to the article "dividends, earnings, and stock prices". His stock model believes that the fair value of stocks should be equal to the dividend per share and the discount rate and long-term dividend growth rate. This model is based on the assumption that the company's dividends grow at a constant rate, and these dark greens remain unchanged. The value of a company's stock increases as the dividend yield increases. M. Gordon believes that the reinvestment of retained earnings of enterprises will have great uncertainty, and the risk of reinvestment will increase over time. He also believes that investors prefer current profits over future earnings, just cash dividends. According to M. Gordon's theory, when the company raises the dividend payout ratio, the risks and uncertainties will be reduced, and the low return of investors will cause the stock price to rise.

Modigliani and Miller (1961) proposed the theory of irrelevant dividends and began to discuss capital structure and dividend policy. MM believes that in a perfect tax-free market, the dividend policy has nothing to do with the company's stock price, and the changes in dividend distribution are only changes in the company's cash dividends and capital gains and surplus distributions. In other words, it does not take into account defects such as taxes, transaction costs, or mismatched information. They believe that the company's stock price will not affect the dividend policy, because the impact of stock value is offset by other financing methods. There are many channels for a company to invest. Retained earnings and dividends from shareholders can be used as the basis for investment. Therefore, it doesn't matter which

company chooses to invest in the overall economy. However, the real-world market is neither perfect nor complete. Whether or not dividends actually affect dividend decisions requires consideration of the existence of relevant variables such as taxes, information, and agency costs. Many researchers try to find out the dividend payment decision under imperfect market conditions and its impact on company value.

Pettit (1977) studied the customer effect of dividends. For example, retired investors and pension funds tend to choose to earn cash, so investors prefer companies to pay higher dividend yields. On the other hand, shareholders are more willing to reinvest in the year when the company's income is higher, and do not like to pay high dividends.

Kania & Bacon (2005) analyzes the financial data of more than 10,000 listed companies. The method they use is the ordinary least squares method, which is OLS. It studies the profitability, growth, risk, liquidity and other factors on the company's dividend decision influences. The study found that profitability (return on equity), growth (sales growth), risk (beta), liquidity (current ratio), control (inside person holding) and expansion (capital expenditure growth) have significant dividend payout rates influences.

Farrar and Selwyn's (1967) tax difference theory answers the question that dividend policy affects enterprise value. The authors argue that a company will not pay a dividend when the individual income tax on dividend income is higher than the capital gains tax. In other words, they think shareholders will get a better deal if the money stays in the company or buys back shares.

Fama (1998) is the author of modern corporate finance theory, which argues that companies should be organized to create value and maximize value. The value here is the total

commanded price of a company in the market, which is the sum of the value of its stock and debt. Therefore, the standards and rules for correct financial decision-making guide the total value of the enterprise toward maximum. Theoretically, the premise of maximizing value is the efficient operation of the capital market. It provides the greatest benefit to companies that use their resources for their best use. The theory emphasizes the importance of corporate financing decisions to corporate market value.

Aivazian, B, Gatchev, V & Spindt, P (2007) attempted to establish a link between the company's dividend policy and the liquidity of the New York Stock Exchange and American Express's stock market from 1963 to 2003. In the analysis of cross-section data, holders of illiquid common stocks have a high probability of receiving cash dividends and vice versa

Sen and Ray (2003) did a research on the key determinants of Indian stock prices. This study is based on stocks that reached the BSE index during the period 1988-2000. Empirical research shows that dividend payment is the most critical factor affecting stock prices. The second factor is earnings per share, which has very little effect on stock prices.

Some variables potentially affect a company's dividend payout decisions. In this study, A set of explanatory variables are selected: financial leverage, return on asset, earns per share, market to book ratio, and size.

III. Research Hypotheses and Selection of Proxy Variables

This section discusses the factors that influence dividend decisions and explains and selects related proxy variables. These factors have often been used by past researchers and are considered to have important effects on dividend policy. This section also shows my hypotheses

that need to be proven

Return on Asset

Lintner (1956) said that the important determinant influencing the dividend decision of a corporate is the net earnings. In another research, Fama and French (2001) found that Compared with smaller and less profitable companies, larger and more profitable companies pay more dividends because dividends are paid from after-tax profits. I predict that a positive correlation between the return on assets and the dividend decision, which is reflected by the return on assets and the dividend distribution rate. In other literature, the return on assets has been used by researchers as an indicator of corporate profitability. The profitability indicators in this article are presented by earnings per share. The return on assets is measured as the ratio between earnings before interest and taxes and the total assets.

Hypothesis 1: *There is a positive relationship between a firm's ROA and dividend payouts ratio.*

Earnings Per Share

The decision to pay dividend derive from profits. Earnings per share in this article as a key factor in the company's profitability. The pecking order theory explains how a company prioritizes financing sources and can also explain the relationship between profitability and dividends. In other words, a company will give priority to using internal funds to meet financial needs. High-margin companies have greater ability to invest internal funds. When financial needs are high, the funding sequence shifts from internal funds to risk-free debt, then to high-

risk debt, and finally equity (Myers 1984, Myers and Majluf 1984). From other literature, profitability is the most critical factor supporting the decision on dividend policy (see, for example, Adaoglu, 2000, and Pandey, 2001).

Under the background of pecking theory, profitability becomes a key factor in dividend decision of Chinese financial enterprises. This is supported by theory. To test this theoretical assumption, earnings per share is used as an indicator of the company's profitability. The hypothesized relationship between earnings per share and dividends is positive.

Hypothesis 2: The profitability (EPS) is positively associated with dividend payouts.

Financial Leverage

In the literature analysis, the company's leverage ratio is an important factor that determines dividend policy. The financial structure of an enterprise includes debt (liabilities) and equity financing. Due to the existence of fixed debt interest and preferred stock dividend, the phenomenon that the change range of common stock earnings per share is greater than the change range of EBITDA becomes financial leverage. Financial risk is mainly generated by financial leverage. In other words, debt financing and fixed financial cost payments increase simultaneously. If a company fails to meet its expenses, the company will go bankrupt (Al-Malkawi, 2008).

The meaning of transaction cost theory is that the higher a company's debt as a percentage of total capital, When the profit before interest and taxes increases, the fixed financial expenses borne by the surplus will be relatively reduced, which will bring more surplus to the common

shareholders (Al-Malkawi, 2008; Higgins, 1972). Rozeff (1982) believed that high leverage would increase the transaction costs and risks of enterprises. Therefore, the higher the leverage ratio, the lower the dividend payout opportunity. Therefore, leverage is negatively correlated with dividends. This result is supported by the agency cost theory of dividend policy.

To study how debt affects dividend decision, the author USES financial leverage ratio to measure this index. It is defined as the ratio of total liabilities to total shareholders' equity in the short and long term (FLEVER). In summary, there is a negative correlation between dividends and financial leverage.

Hypothesis 3: There is a negative relationship between financial leverage (FLEV) and dividend payout ratio (DPO)

Firm Size

Large companies have higher initiative. Therefore, larger companies can easily enter the capital market, compared with small companies. Large companies can finance at a smaller cost, so large companies are also more likely to pay dividends. The transaction cost theory of dividend policy supports this view (Ho, 2003; Gul and Kealey, 1999). Another view is that the management requirements of large companies have become higher, and the agency problem between managers and shareholders has deepened. Considering the above two aspects, I guess there is a positive correlation between the size of the company and the dividend payout ratio. Company size is measured by natural logarithm of total assets.

Hypothesis 4: *The probability of paying a dividend increases with firm size.*

Firm Growth Opportunity

Three determinants, which are market-to-book ratio, age of the firm, and the square of age, are summarized by the researchers as firm growth and investment opportunities (see, for example, Al-Malkawi, 2007; Basil, 2009). This article only uses the MBR to verify the relationship with dividend payment. The greater the growth opportunities or the more room for growth, the higher the capital requirements can be accommodated. Because the company will choose to keep more retained earnings to provide growth opportunities for the company. (Chang and Rhee, 1990). As a result, the authors argue that companies with highly likely growth opportunities are less likely to pay dividends.

In addition, mature companies may be in a low-growth stage with fewer financing opportunities. Due to the slow economic growth and reduced capital expenditures, these companies have no pressure from shareholders, which allows them to follow a non-tight dividend policy (see Barclay et al., 1995, and Grullon et al., 2002).

Hypothesis 5: *There is a positive relationship between market to book ratio and dividend payout ratio.*

IV. Data

This study explores the determinants of dividend payment decisions for Chinese financial companies. The data used comes from the financial statement, financial indices, and listed

private enterprises provided by CSMAR Database, covered the five-year period, 2014 to 2018 of on one hundred and nine firms. The 109 companies were both old and newly established, and some were delisted during the research period. Therefore, the observation data of each company is different. In previous regression tests, the absence of a single cross-section led to a reduction in observations. In order to obtain considerable data observations, mixed cross section data were used. In addition, the author also sorted by time series.. Panels are unbalanced due to the different number of observations per company. The observation point of earnings per share in the variable is January 1 of each year. Other variables were observed at 31 December. In addition, the total assets in the data are not frequently changed in the financial industry. Total asset data at the end of each year is difficult to find. Therefore, if data on total assets are not found at the end of the year, the most recent data available before that point in time will be used

Due to missing or incomplete data in the database, it is not possible to sort out data from all financial industry companies to build a balanced template. Within five years of the time span, this study used complete data from 61 companies. The final observation quantity determined by the study is about 305. The amount of missing data is within single digits. These companies are more than fifty percent representative in the financial industry. This study includes two types of companies, dividend-paying companies and non-paying companies. Exclusion of non-dividend companies may cause selection bias issues (Kim and Maddala 1992).

Methodology

The use of panel methodology base on the panel character of the data. The panel regression model differs from a normal time-series or cross section model by attaching the double

subscript to each variable (Kashif, 2011). Over the past decade, advances in panel data measurement in the economic field have opened the way for regression estimation using panel data. In panel data (merge) regression, time series and cross-sectional observations are merged and estimated. In other words, several cross-sectional units were observed over a period set by the panel data (Cahit, 2000).

The Model

The most basic panel data model can be expressed in the following form:

$$Y_{it} = \alpha_{it} + \beta X_{it} + \varepsilon_{it}$$

The subscript i denotes the cross-sectional dimension and t represents the time-series dimension. Y_{it} represents the dependent variable in the model. X_{it} contains the set of explanatory variables in the estimation model. α is the constant and β represents the coefficients.

According to the above model, based on the selected variables, this study uses an econometric model, as shown in the figure below.:

$$DPO_{it} = \alpha_{it} + \beta_1 ROA_{it} + \beta_2 EPS_{it} + \beta_3 FLEV_{it} + \beta_4 SIZE_{it} + \beta_5 MB_{it} + \varepsilon_{it}$$

$$i=1, \dots, N \text{ and } t=1, \dots, T$$

Where DPO is the dividend payout ratio, measured by dividend distribution ratio. ROA means return on asset, measured by net income to total asset. EPS is earnings per share. FLEV is financial leverage, total debt to equity. SIZE is the nature logarithm of total assets at the year

end. MB means book to book ratio, which is the market value per share divided by book value per share. MB measured by inverse of book to market ratio in this study.

The outcomes of the fixed effects model and random effects model are shown in Table 3 and Table 4. In order to determine on whether the fixed effects model or the random effects model, the Hausman (1978) specification test was employed. Based on the comparison results shows in Table 3 and Table 4, the random effects model was considered more appropriate for estimating the regression mode.

V. Discussion of Empirical Results

Descriptive Statistics

Table 1 gives the descriptive statistics of the variables used in the study. From the table, you can see that the observed values of all proxy variables are basically the same. The table reports the mean, standard deviation, minimum, maximum, and the number of observations for each variable. The financial industries in China paid a 27.7% dividend during the study period. The return on assets was as low as 2.70%, with some companies recording a minimum of -15.10% and the maximum being 44.90%. However, the standard deviation of ROA shows that most companies do not have a large gap with the average rate of return. The average company size is 25.8, and the deviation is relatively small. It explains that the companies which are researched in this study are mature. The average level of financial leverage is 1.06. The risk level is considerable.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
dpo	305	.277	.236	0	1.891
roa	303	.027	.041	-.151	.449
pro	305	.797	.686	-.99	3.56
size	305	25.861	2.867	19.249	31.058
flev	305	1.06	.477	-1.675	8.445
mb	305	1.53	1.395	.859	19.093

Note: All observations are from 2014 to 2018 over five years. DPO means dividend payout ratio, also called dividend distribution ratio. ROA means return on asset, net income to total asset. FLEV is a firm's financial leverage defined as total debt divided by total capital employed. EPS is earnings per share. Size is the natural logarithm of total assets. MB is market to book ratio.

Correlation Analysis

To determine whether the coefficient estimates will change erratically with small changes in the model or data, the correlation coefficients of the explanatory variables have been shown in Table 2. Table 2 represents the correlation between the independent variables and variance inflation factor (VIF).

Table 2: Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) dpo	1.000					
(2) roa	-0.018	1.000				
(3) pro	-0.036	-0.133	1.000			
(4) size	0.001	-0.396	0.564	1.000		
(5) flev	-0.074	-0.040	-0.097	-0.176	1.000	
(6) mb	0.034	0.331	-0.283	-0.523	-0.012	1.000

Note: DPO means dividend payout ratio, also called dividend distribution ratio. ROA means return on asset, net income to total asset. FLEV is a firm's financial leverage defined as total debt divided by total capital employed. EPS is earnings per share. Size is the natural logarithm of total assets. MB is market to book ratio.

Discussion of Regression Results

Based on the model I studied and the observed plate data, the regression was run in plate mode. The author chooses two modes of fixed effect and random effect. The results show that the most robust are random effects. The authors therefore report the regression results of the random effects model. In addition, the author retains the two regression tables and does not remove the weak ones. The dependent variable payout ratio is regressed according to four explanations. These variables include return on assets, earnings per share, financial leverage, price-to-book ratio and company size. From the analysis of results, there is a negative correlation between profitability and dividend payout ratio, but it is not significant. The result is contrary to the hypothesis that the profitability and the dividend payout ratio are positively correlated and is inconsistent with the results of other literatures. Generally, high-margin companies have more retained earnings and they are more inclined to pay dividends to shareholders. Therefore, the company will also have a higher dividend payout ratio. In addition, the profitability of an enterprise is considered to be an important factor affecting the dividend decision. The author's findings were different from what he expected, which surprised the author. Especially the author believes that the most critical factor is profitability. The authors could not find literature with the same results to confirm this result, because the research results of other literatures show that profitability is positively related to the dividend payout ratio. Fortunately, the negative correlation between profitability and dividend payout is not significant. This shows that the authenticity of the results needs to be verified. Other literatures have also shown that the results of the regression are inconsistent with the hypothesis and contrary to the results of other literatures (see Amidu & Abor, 2006).

Another independent variable related to profitability is the return on assets. The negative coefficient sign of the result indicates that the return on assets is negatively related to the dividend payout ratio. Return on assets is a measure of profitability. The result is different from conjecture. The author is puzzled. However, the authors never conclude that the negative correlation of the results remains to be confirmed.

The company's growth opportunities are positively correlated with the dividend payout ratio and are shown in the regression results. As the results are not significant, the author does not believe that the company's growth opportunities have become a key factor affecting the dividend decision to a certain extent. Aivazian et al. (2003) got the uniform result in their researches. The correlation is the same as hypothesis, but this result contradicts the agency theory of dividend policy. In other words, a company with high growth opportunities still pays more dividends when there are more financing opportunities. This may also indicate that most of these companies are state-owned enterprises and are less likely to go bankrupt and have the ability to distribute profits to shareholders. This situation is also consistent with the regional form studied by the author. Most of China's financial industry belongs to state-owned enterprises. Most of it here is not quantity but market share. Researchers in other literature have different results. Amidu (2006) believes that the market to book ratio is an indicator of the company's future prospects and investment opportunities. His results showed a negative correlation between the market to book ratio and the dividend payout ratio. Companies with a high market to book ratio often have good investment opportunities. The company will retain more funds and the dividend payment rate will be reduced.

As expected, a positive signal for the size of the regression variable indicates that the size

of the company is positively related to the company's dividend payout ratio. Large-scale companies are superior to small companies in entering the market and raising funds. On the other hand, the companies of Chinese financial companies are relatively mature and more diversified, so the possibility of facing financial difficulties is relatively low. So big companies are more capable and have more money to pay dividends to shareholders. This result is supported by the theory of the transaction cost of dividend policy (Holder et al., 1998). The impact of corporate size on dividend policy has economic significance. Al-Malkawi (2008) believes that the larger the company, the more difficult it is to monitor, the higher the cost, and the larger the agency problem. Dividends can act as a buffer against agency issues.

The key factor that ultimately affects dividend decisions is financial leverage. The regression results show that there is a negative correlation between financial leverage and the payment rate of dividends. The results are not significant but close to significant. This conclusion appears in the model in Table 2 and is consistent with the agency theory. Companies with low debt ratios are better able to pay dividends. High-leverage companies pay dividends because fixed interest payments are lower than low-leverage companies. If a company has a tight financial situation, it will be difficult for the company to pay dividends to shareholders (see Amidu & Abor, 2006).

Table 3: Regression results (Random Effect Model)

dpo	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
roa	-0.182	0.368	-0.50	0.621	-0.904	0.540	
pro	-0.017	0.024	-0.71	0.475	-0.065	0.030	
size	0.002	0.007	0.30	0.761	-0.011	0.016	
flev	-0.037	0.029	-1.26	0.206	-0.095	0.020	
mb	0.007	0.012	0.62	0.538	-0.016	0.030	
Constant	0.271	0.191	1.42	0.157	-0.104	0.645	
Mean dependent var		0.278	SD dependent var			0.236	
Overall r-squared		0.009	Number of obs			303.000	
Chi-square		2.827	Prob > chi2			0.727	
R-squared within		0.008	R-squared between			0.244	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4: Regression results (Fixed Effect Model)

dpo	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
roa	-0.032	0.376	-0.08	0.933	-0.772	0.709	
pro	-0.012	0.025	-0.49	0.625	-0.061	0.037	
size	0.000	0.007	0.06	0.956	-0.014	0.014	
flev	-0.036	0.029	-1.21	0.226	-0.093	0.022	
mb	0.009	0.012	0.80	0.422	-0.014	0.033	
Constant	0.302	0.194	1.56	0.121	-0.080	0.684	
Mean dependent var		0.278	SD dependent var			0.236	
R-squared		0.010	Number of obs			303.000	
F-test		0.579	Prob > F			0.814	
Akaike crit. (AIC)		-12.257	Bayesian crit. (BIC)			10.025	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

VI. Conclusion

Researchers in each field have researched dividend decision-making or related knowledge points and have put forward their own explanations for dividend behavior. Earlier literature mentioned that the most important factor influencing dividend decisions is taxation, but the

literature in recent years has more emphasized the assumption of agency costs. Whether it's taxes or costs, the decision to pay dividends is still confusing. The solutions proposed by researchers in the literature are either failed or contradictory. This is the appeal of dividend policy. The author is also trying to find answers to several questions: Will the determinants of the dividend policy of Chinese financial industry companies change? How is the correlation between key factors and dividend decisions compared to the past financial industry?

The purpose of this article is to identify the key factors that affect the decision of Chinese companies to pay dividends, especially the financial industry. The companies that account for most of the financial industry are banks, securities institutions, and insurance. The panel data comes from the financial statements, financial indicator analysis, and private listed company tables of China's financial industry from 2014 to 2018. The form is provided by CSMAR. The author uses a random effects model to analyze the dividend policy. The results show that dividend decisions are negatively related to profitability ROA and earnings per share, and financial leverage to financial risk. On the other hand, research finds that the size of a company is positively correlated with the price-to-book ratio in a company's growth opportunities. None of the five proxy variables achieved significant results in the results, but the variable that was close to significant was financial leverage. Financial leverage in this research will be a key factor affecting dividend decisions. The author's profitability was inconsistent with the theory, which surprised the author. However, the results of this study are consistent with the pecking theory and cost theory of dividend policy. When formulating an appropriate dividend policy, managers can consider the main determinants of the dividend payment rate. Considering the nature of the company based on paying dividends, investors can choose a company to make

better investments

The author's discrepancy in this result mentions two reasons. First, the cross-section of the mixed data is disordered, but the author believes that this possibility is low. Second, the dependent variable was not selected properly. But there are literatures that use the dividend distribution rate as the dependent variable. In summary, the data from this study will serve as a reference for exploring the theme of the influencing factors of dividend policy. Future research can continue to explore the impact of the same proxy variables on China's financial industry companies or look at other proxy variables to explore more comprehensive and comprehensive solutions.

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