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**The Determinants of Dividend Payout Ratio on Real Estate Listed Companies in
China: An Empirical Study on Stock Price Volatility**

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for the Bachelor of Science in Finance

by

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Abstract

The real estate industry is a capital-intensive industry and has a strong influence on the development of related industries in China. A reasonable dividend distribution policy is of great significance to its financing to meet the funding requirements for its own development. This paper will examine empirically on the determinants of dividend payout ratio of the real estate listed companies in China, and how does the dividend payout ratio impact the stock price volatility. First, relating data is retrieved from the Wind dataset. Second, I will clean the data to make it feasible for testing. Third, I will use SPSS, the statistical analyzing software, to test the data. The importance of this test can be discussed from two perspectives. This test would suggest factors could affect the dividend policy that the company has set, and how does the dividend payout ratio affect the company's stock price.

Keywords: Dividend payout, Stock price volatility, Earnings per share, Return on equity, Dividend per share, China real estate

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Introduction

The study of dividend policy can be traced back to the nineteenth century. Williams summed up all the expected future dividends of the company, equating the sum of the present value with the value of the company. This makes dividends have the function of measuring the company's valuation. Since then, the "one bird in hand" theory has gained widespread popularity and support. Supporters believe that companies should distribute profits to investors in a timely manner, and scholars believe that the significance of a company's existence is to pay dividends. However, Modigliani and Miller believe that the existing dividend theory lacks systematic research, and both believe that they have not received rigorous logical arguments. In 1961, they put forward the argument that "dividend policy irrelevancy", which became a milestone in dividend research. Since then, scholars have relaxed the assumptions of MM theory and put forward a series of classic theories such as tax differential theory, follower effect theory, and signal transmission theory. These theories all explain some dividend phenomena of companies and investors to a certain extent, but they cannot perfectly explain the emergence of some abnormal phenomena.

The real estate industry is an indispensable part of China's economic health and steady anti-occupation. The housing system reform was carried out in the 1980s, which vigorously promoted the commercialization and socialization of urban housing, which also enabled the rapid rise of China's real estate industry. Until today, the real estate industry has been an important pillar of my country's economy. Because of the

particularity of the real estate industry, it is not only related to the economy, but also related to the people's livelihood. In recent years, the state and the government have issued various policies on the regulation of housing prices. In the 2016 Central Economic Work Conference, the concept of "houses are used for living rather than speculation" was put forward for the first time, and supporting housing enterprises financing restrictions, investor purchase restrictions and other policies have been implemented one after another. In 2019, the form of strict construction management continued. Many government meetings emphasized the need to stabilize the price of the property market. The government began to regulate the funding of real estate enterprises. The scope involved bank loans, trust loans, overseas debt and other fields. China's real estate investment, sales area and housing prices slowed down significantly in 2015.

In general, China's real estate industry has entered a new stage of steady development. In order for the real estate industry to develop healthily, the management of listed companies must also make more scientific and reasonable financial decisions. The existing dividend policy research is usually based on the conclusions drawn by all listed companies. Whether the conclusions of a certain industry are still applicable, further research is needed. From this point of view, this article selectively uses the real estate companies listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange as samples, and the conclusions drawn are more practical to understand the real estate company's dividend policy.

Literature Review

1. Overview of factors affecting the macroeconomic environment.

(1) Industry factors

Scholars have found that the dividend policy of listed companies has prominent industry characteristics. The dividend payout ratio of mature industries is generally higher than that of emerging industries. For example, public utilities typically have a relatively high dividend payout ratio as a relatively mature industry. An empirical study by Smith and Watts (1992) found that the industry's average dividend payout ratio is negatively correlated with the industry's investment opportunities. That is, the sunset industry's dividend payout ratio is higher than that of the sunrise industry. In addition, state support and policy supervision are also important factors that affect the industry's dividend payout ratio.

(2) The speed of economic development

There is a positive correlation between macroeconomic development and the level of company dividend payment. When the economy develops rapidly, the company's performance increases, and it is bound to be more inclined to distribute dividends. When the economy is down, companies often adopt more passive dividend policies. In 1996, Bernanke put forward the theory of counter-cyclical changes in the macro-financial environment. According to this theory, companies will pay higher dividends

when the economy is developing rapidly and lower dividends when the economy is down because funds are scarcer.

(3) Policies and regulations and investor protection

La Porta (2000) found that a developed securities market will pay more attention to protecting the interests of investors, and the dividend policy can play a role in reducing agency costs. On the contrary, in the underdeveloped securities market, it is difficult to protect the interests of small shareholders, and it is difficult for the dividend policy to play a role in it. At the same time, the legal system will also affect the company's choice of dividend policy. Compared with civil law countries, listed companies in common law countries tend to distribute more dividends.

2. Summary of the influencing factors of company characteristics.

(1) Company size

The existing literature generally believes that companies of different sizes will adopt other dividend policies and that larger companies tend to pay more cash dividends. Crutchley and Hansen reached this conclusion in 1989 by comparing the dividend policies of companies of different sizes. Allen and Michaely (2003) believe that the size of listed companies is directly proportional to the cash dividend payout ratio. This is because the larger the company, the stronger the ability to withstand and diversify risks, and the more stable the net cash flow. Therefore, when paying cash dividends, the dividend payout ratio of large-scale companies is generally higher than

that of small-scale companies. In 2006, Eije and Megginson selected relevant companies' relevant data in major EU countries from 1980 to 2003 as a sample. They found that the larger the company, the more likely it is to pay higher cash dividends.

(2) Profitability

The dividend payout rate of listed companies is often positively correlated with the profitability of the company. This is a view generally accepted by the academic community. Linter (1965) found that between 1946 and 1954, the selection of dividend policies by 600 listed companies in the United States strongly correlates with the level of corporate profit. The higher the corporate profit level, the higher the continuous income, and the higher the dividend payout rate. The more stable the dividend distribution. Most listed companies are willing to continue to pay dividends steadily. However, since changes in net profit always precede changes in the dividend payout ratio, the dividend payout ratio has long-term variability. Watts (1973) confirmed that Lint's view is correct in empirical analysis. He believes that a higher dividend payout rate guarantees shareholder loyalty, which will further help the company operate more sustainably and efficiently. At the same time, Fama (2006) established a logistic model after selecting the dividend distribution data of U.S. listed companies from 1926 to 1999, then concluded that due to the small size of the company, the low level of profitability, and the few investment opportunities for high growth, newly listed companies are not suitable Distribution of dividends.

(3) Growth ability

Regarding the impact of growth on the dividend policy of listed companies, the existing literature generally believes that growth companies tend to adopt a more passive dividend policy out of consideration of investment funds. When Gaver (1993) studied the relationship between the company's growth ability and the level of dividend payment, according to the characteristics of the variables, the samples were divided into high-growth and low-growth companies. He found that the company's investment growth opportunities are negatively correlated with the company's dividend payout ratio. That is, compared with low-growth companies, high-growth companies pay lower dividends. At the same time, under the premise of ensuring the relevant rights and interests of small and medium shareholders, the dividend payment rate of high-growth companies in developed countries is generally low. In contrast, developing countries have not paid enough attention to the protection of the rights and interests of small and medium shareholders due to the late start of the stock market, and the level of dividend payment of listed companies is lower, poorer sustainability, but this has nothing to do with the company's ability to grow. There is also a view that the expected return rate and dividend payout rate of listed companies are negatively related to the company's growth ability. To maintain continuous market competitiveness, high-growth companies will choose to pay low cash dividends in the long term to set aside the remaining funds for investment in projects with better returns.

(4) Cash flow

Cash flow refers to the general term of cash inflows, cash outflows, and their total amount generated by certain economic activities (including operating activities, investment activities, financing activities and non-recurring items) in accordance with receipts and payments within a specific accounting period. According to Denis, D. J., Denis, D. K., & Sarin, A. (1994), Bradley, M., Capozza, D. R., & Seguin, P. J. (1998), Lang, L. H., & Litzenberger, R. H. (1989), cash flow is also an essential factor in determining the choice of dividend policy. The uncertainty of cash flow is negatively related to the dividend payment rate. The greater the uncertain future cash flow, the lower the possibility of a company's distribution of cash dividends.

3. A summary of the influencing factors of corporate governance structure

The existing literature believes that there is a specific correlation between the corporate governance structure and dividends. The dividend policy itself is an integral part of corporate governance, and corporate governance generally includes equity structure and equity structure. The academic circles usually study the influence of corporate governance structure on dividend policy from two aspects of equity concentration and shareholder types. There is a negative correlation between equity concentration and dividend policy. That is, the higher the company's equity concentration, the lower the dividends paid to shareholders, and the more dispersed the equity structure, the higher the dividend paid by the company. Dewenter and Warther (1998) found through a comparative study of U.S. and Japan dividend

policies that, in terms of structural concentration, U.S. companies have lower levels of cash dividends, while Japanese companies have a more concentrated shareholding structure and pay lower cash dividends. It can be seen from the comparison results that different equity concentrations will cause significant differences in the level of dividend payment. In 2002, Kenneth and Dolly found that due to the existence of internal transactions in the U.S. listed companies from 1982 to 1995, higher shareholding ratios and dividend payout ratios became the norm for institutional investors. This indicates that the type of shareholder also has a higher dividend payout ratio. Therefore, the policy is also affected by the corporate governance structure. For example, managers' stock options can counterbalance the company's ownership, which is usually negatively correlated with the company's dividend payout ratio.

4. Impact of Dividend Payout Ratio on Stock Price Volatility

Many existing studies are inclined to have a common belief that dividend yield is not a mere proxy. Instead, they hold that there is a significant negative correlation between dividend payout ratio and the stock price volatility. The same conclusion was tested and verified by Hussainey, K., Mgbame, C. O., & Chijoke-Mgbame, A. M.'s (2011) UK results, Baskin's (1989) US results, and Asghar, M., Shah, S. Z. A., Hamid, K., & Suleman, M. T's (2011) Pakistan results, all of them verified the negative relationship between the dividend payout ratio and the stock price volatility. However, Allen, D. E., & Rachim, V. S. (1996)'s study on 173 Australian listed

companies revealed no significant correlation between dividend payout ratio and price volatility.

Methodology

Influencing factors of dividend payout ratio and the influence of dividend payout ratio on the price volatility

Profitability: Profitability is the basis for the company's sustainable and stable development. Only with surplus companies can cash dividends be distributed. On the one hand, companies with poor profitability face greater operating risks, and the cost of obtaining bank loans and other external funds is higher, so their daily operations and investments mainly rely on retained earnings. On the other hand, only companies with better profitability may generate more net profits to support cash distribution to investors. Rehman, A., & Takumi, H. conducted an empirical study that researched the determinants of dividend payout ratio by exploiting data from Karachi Stock Exchange (KSE), and their study reveals a significant positive relationship between profitability variables and dividend payout ratio (2012). From the perspective of company valuation, mainstream relative valuation methods often refer to the price-to-earnings ratio (P/E) indicator, that is, the ratio of stock price per share to net profit per share, which also shows that the company's profitability is closely related to the company's stock price.

Investment opportunity: The more investment opportunities a company has, the more funds it needs to invest in new projects. In order to reduce the high cost of external financing as much as possible, companies will first use internal funds to support the

project, and the incentives to distribute will be reduced accordingly. On the contrary, companies with fewer investment opportunities will pay higher cash dividends in order to prevent corporate management from investing the company's cash flow in low-yield or negative net present value projects. In other words, the transfer of internal cash in the form of dividends has played a role in reducing agency costs between shareholders and management. Many studies have also found that companies with fewer investment opportunities pay more and retain less free cash flow.

Company size: The size of a company represents all the resources available to the company. The classic principal-agent problem tells us that when a company has sufficient resources, the management is more likely to engage in high consumption and not work hard to maximize personal interests. Therefore, paying the available cash of the company's reputation as dividends to the company's shareholders can effectively reduce the possibility of the company's management wasting the company's resources.

Dividend payout ratio: The dividend payout ratio is negatively correlated with the stock price volatility. In other words, given a rise in the dividend payout ratio, there would follow with a decrease in the stock price volatility of a company.

Method Used

This empirical study design can be divided into two sections. The first section is cross-sectional in nature, which aims to determine the factors of dividend payout ratio of listed real estate companies in China. Listed real estate companies that pay dividend in China constitute the study population. It is possible to obtain an overall picture of the impact of relative variables on the dividend payout ratio of listed real estate businesses in China by taking a cross-section of both the study population and the inquiry period. In the second section, a time-series analysis will be conducted to analyze how the dividend payout ratio impact the stock price volatility.

The regression model to be used in this study to test the influencing factors of dividend payout ratio is adopted from the study conducted by Fitri, R. R., Hosen, M. N., & Muhari, S. (2016), which is written as follows.

$$DPR_{it} = \alpha + \beta_1 EPS_{it} + \beta_2 ROE_{it} + \beta_3 ONCF_{it} + \beta_4 FCFE_{it} + \beta_5 NCF_{it} + \beta_6 DPS_{it} + \beta_7 TA_{it} + \epsilon_{it} \quad (1)$$

Where:

Y : Dividend Payout Ratio

α : Constanta

$\beta_1 - \beta_4$: Regression coefficients for independent variables

EPS: Earnings per share

ROE: Return on equity

ONCF: Operating net cash flow

FCFE: Free cash flow to equity

NCF: Net cash flow

DPS: Dividend per share

TA: Total assets

ϵ : Standard of Error

In this empirical study, there are seven variables used to analyze the correlation between the dividend payout ratio and relative variables.

An ordinal logistic regression model is applied to the data in SPSS to quantify the determinants of dividend payout ratio of listed real estate businesses in China and to infer the link between all of these factors. The dependent variable is dividend payout ratio, seven independent variables are Earnings per share (EPS), Return on equity (ROE), Operating net cash flow (ONCF), Free cash flow to equity (FCFE), Net cash flow (NCF), Dividend per share (DPS), and Total assets (TA).

Variable name	Measure of variables	Definition of variables
Earnings per share (EPS)	Net profit/total shares	Profitability
Return on equity (ROE)	Net profit/total equity	Investment opportunity
Operating net cash flow (ONCF)	Operating cash flow/total shares	Ability to pay out of cash flow
Free cash flow to equity (FCFE)	Free cash flow to equity/total shares	Ability to pay out of cash flow
Net cash flow (NCF)	Net cash flow/total shares	Ability to pay out of cash flow
Dividend per share (DPS)	Dividend/total shares	Ability to cash dividend payments
Total assets (TA)	Logarithm total assets	Size of company

For the analysis of the impact of dividend payout ratio on stock price volatility, The dependent variable, stock price volatility, is calculated based on the formula proposed by Baskin (1989). The annual range of stock prices is split by the average of the year's highest and lowest prices, and the measurement standard is raised to the second power. This can be described as:

$$P\text{-Vol}_{it} = \sqrt{\frac{HP_{it} - LP_{it}}{\left(\frac{HP_{it} + LP_{it}}{2}\right)^2}}$$

Data Collection

All row data is retrieved from the Wind database, which provided secondary data including annual report and monthly stock price. The dataset consists of 30 listed real estate companies in China, which covers all relative information for ten years from 2011 to 2020. The stock price is observed on a monthly basis, and the number of monthly observations is 3,600 in total.

The sample of this research is the companies registered on the Shanghai Stock Exchange and Shenzhen Stock Exchange during the research period, from 2011 to 2020. The samples in this study were selected using purposeful sampling methods. This method of selecting samples is based on the evaluation of several criteria for samples used for research purposes, such as:

1. During the research period from 2011 to 2020, the company is still listed in the market.
2. The company has completed the required data, namely the annual financial statements from December 31, 2011 to 2020.
3. Companies that continue to pay dividends during the study period.

Analysis and Findings

Determinants of the Dividend Payout Ratio

Descriptive Statistics			
	N	Mean	Std. Dev
EPS	30	1.01427	1.588515
ROE	30	8.53381	17.126567
ONCF	30	9144552994.57533	14994402555.459713
FCFE	30	976029445.78312	13038313611.850710
NCF	30	4668492444.85167	8726909856.838568
DPS	30	.37801	.398539
TA	30	369716047233.51140	429802118011.495670
Dividend Payout Ratio	30	.27037	.265545
Valid N (listwise)	30		

Table 1- Descriptive Data

The table is a descriptive statistics table which exhibits the information including the sample size, mean, and variance of earnings per share, return on equity, operating net cash flow, free cash flow to equity, net cash flow, dividend per share, total asset, and

dividend payout ratio. In this table, mean indicates the average value of the variable, the Std. Dev represents the standard deviation of the variable.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.697 ^a	.486	.323	.218545

Change statistics				
R Square Change	F Change	df1	df2	Sig. F Change
.486	2.974	7	22	.024

a. Dependent Variable: Dividend payout ratio

Table 2- Model Summary

The table is the model summary. From the result below, we can see that the R square is 0.323, and the significant change P value is 0.024 far less than 0.05, indicating that the fitting effect of this regression model is very good.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.994	7	.142	2.974	.024 ^b
	Residual	1.051	22	.048		
	Total	2.045	29			

a. Dependent Variable: Dividend payout ratio

b. Predictors: (Constant), EPS, ROE, ONCF, FCFE, NCF, DPS, TA

Table 3- Analysis of Variance

The table is an analysis of variance. It can be seen that the significance of the analysis of variance is $0.024 < 0.05$, indicating that there is a significant linear relationship between the independent variable (EPS, ROE, ONCF, FCFE, NCF, DPS, TA) and the dependent variable (dividend payout ratio) in this analysis.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.114	.069		1.655	.112
EPS	-.249	.089	-1.489	-2.800	.010
ROE	.016	.005	1.019	3.335	.003
ONCF	1.625E-13	.000	.009	.025	.980
FCFE	3.411E-12	.000	.167	.975	.340
NCF	-1.032E-12	.000	-.034	-.134	.894
TA	-6.682E-14	.000	-.108	-.329	.745
DPS	.790	.279	1.186	2.829	.010

a. Dependent Variable: Dividend payout ratio

Table 4- Coefficients

The table shown is coefficients, and it reveals that the results of regression analysis are good. The p values of EPS, ROE, and DPS are 0.01, 0.03, and 0.01, respectively, which are far less than 0.05. Therefore, these independent variables are considered to be significant. While the p values of constants, ONCF, FCFE, NCF, and TA are greater than 0.05, so it can be considered that the variables are not significant.

In summary, the regression equation of this regression analysis is:

$$Y = -0.249EPS + 0.0166ROE + 0.79DPS$$

The impact of dividend policy on Stock Price Volatility

	Correlation		
	Stock Price Volatility	payout ratio	dividend yield
Stock Price Volatility	1		
payout ratio	-.11	1	
dividend yield	-.250**	-.075	1

Table5- Correlation between dividend payout ratio, dividend yield and stock price volatility

According to table5, the correlation coefficient between stock price volatility and dividend yield is -.25 and reaches the significance level of 0.01. Therefore, there is a significant negative correlation between stock price volatility and dividend yield.

Regression analysis based on GMM Estimation				
variable	coefficient	SE	t	p
C	0.248	0.010	25.980	0.000
dividend yield	-0.320	0.072	-4.418	0.000
payout ratio	-0.014	0.011	-1.285	0.199
R-squared	0.086	Mean dependent var		0.215
Adjusted R-squared	0.078	S.D. dependent var		0.062

S.E. of regression	0.053	Sum squared resid	0.634
Durbin-Waston	2.031	X2	20.524

Table6- regression analysis using GMM estimation

According to table6, the adjusted R-squared of this regression analysis is 0.077, that is, the explanatory variable has little explanatory power on the explained variable. The regression coefficient of the independent variable, dividend yield, is -0.3201902 and reaches the significance level of 0.01, that is, the independent variable dividend yield has a significant predictive effect on the dependent variable. When the Wald chi square test was performed on the model, it was found that the model did not pass the Wald chi square test (chi = 20.524, P = 0.001 < 0.01), which means that dividend payout ratio does not have an impact on stock price volatility, so the impact of payout ratio on stock price volatility cannot be specifically analyzed. Also, the Durbin Waston's test value is 2.031, close to the standard of 2, so the residual of regression analysis meets the requirements of independence.

Conclusion

This research takes the China Real Estate Listed Companies of Shanghai Stock Exchange and Shenzhen Stock Exchange as the research objects, and explores the influencing factors of the dividend payout ratio and the impact of dividend policy on stock price volatility.

This study begins with conclusions that EPS, ROE, and DPS have significant influence on the dividend payout ratio, while the ONCF, FCFE, NCF, TA reveals no significant impact on the dividend payout ratio. ROE and DPS are positively correlated with dividend payout ratio. EPS variable leads to negative correlation of dividend payout ratio. It is found that the variable that has the greatest influence on the dividend payout rate is DPS, and the regression coefficient is 0.790, which indicates that, assuming all other factors constant, each additional increase of DPS factor will result in an increase of 0.79 in the amount of dividend payout rate. This result is in line with the study conducted by Rehman, A., & Takumi, H. (2012).

In the second part investigating the influence of dividend policy on the stock price fluctuations, this study has endeavored to figure out the impact of dividend policy on the stock price volatility of listed real estate companies in China through descriptive analysis, Pearson correlation analysis and panel GMM analysis. However, the dividend policy variables in this study shows no significant influence on the stock price volatility. Because the model fails to pass the Wald chi square test ($\chi^2 =$

20.524, $P = 0.001 < 0.01$), indicating no correlation between dividend payout ratio and stock price volatility, so the impact of payout ratio on stock price volatility cannot be specifically analyzed. Also, the model doesn't pass the Durbin Waston's test either, with the Durbin Waston's value of 2.031, close to the standard of 2. Consequently, the residual of regression analysis meets the requirements of independence.

Limitations and Contributions

This test has several limitations associating with the sampling method, and the size of dataset, and the processing method of row data.

The first limitation is that the dataset is selected using a purposeful sampling method, which may involve inherent vulnerability of errors in judgement by the researcher.

The second limitation is the size of dataset. Although the Wind database is abundant in data resources, there are only a few Chinese real estate companies that meet the predetermined criteria in the process of sampling. Consequently, the dataset of this study consists of only thirty representative listed real estate companies, which is not large enough to generalize an overall picture on the real estate industry in China.

In addition, the processing method adopted by the researcher may still need improvement since the researcher doesn't have much scientific research experience.

Another issue is that the result between dividend payout ratio, dividend yield, and price volatility is not significant statistically, so impact of dividend policy on stock price volatility cannot be specifically analyzed.

Despite that this paper has many improvements to be implemented, this paper has its own implications that can be beneficial for different sectors in the society. As for the contributions, this paper has provide an sight to discover what factors impact the dividend payout ratio and how does the dividend payout ratio moves the share price. Compared with papers adopt complicated analyzing methods and algorithm to examine the determinants of dividend payout ratio, this paper provides a light on a pathway that is more straightforward. In addition, this paper focused on the real estate company to provide more practical conclusions to understand the real estate company's dividend policy.

From the perspective of management, this topic suggests a company's management what to consider which factors could affect the dividend policy that the company has set. It should pay attention to the factors that impact the dividend payout ratio in establishing its dividend policy.

From investors' perspective, especially those who expect dividends as significant returns, this paper may provide references for them when making decisions. Factors including EPS, ROE, and DPS should be taken into consideration if there are certain

expectations for dividends. The data presented covers a 10-year span, which exhibits a brief view of the current and previous conditions of the Chinese real estate market.

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