Dividend Policy Determinants of Firm Value: Empirical Evidence from Listed Non-Financial Companies in Nigeria

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Abstract: **The broad objective of this study is to empirically examine dividend policy as determinants of firm value of listed companies in Nigeria by employing apanel data of ten (10) year, from 2010 to 2019 time frame. To achieve this objective, we employed one notable measure of firm value (market to book ratio) and selected specific proxies of dividend policy which have been employed in related prior literature. To this end, we hypothesized that dividend policy measures which include; dividend yield, dividend per share and dividend pay-out ratio are no significant determinants of firm value across listed non-financial firms during the period under investigation in Nigeria. Robust least square regression analysis was employed to test the formulated hypotheses. Results obtained from the descriptive statistics revealed that dividend pay-out is an insignificant determinant of market to book value shown as; DIVPAY (Coef. = -0.0001, t = -0.34 and P -value = 0.737). Again, dividend per share has a significant positive influence on market to shown as; DIPS (Coef. = 0.7692, t = 61.98 and P -value = 0.000). More so, dividend yield has a significant (1%) negative effect on market to book value shown as; DIYD (Coef. = -0.0500, t = -5.63 and P -value = 0.000). From the findings, we conclude that dividend yield and dividend per share are determinants of firm value. However, dividend pay-out ratio is not a significant determinant of firm value in Nigeria. It is recommended that management should concert policies and efforts which will reduce profits share to investors and redirect those funds as retained earnings for the purpose of growing the company.**

Keywords: **Dividend Payout, Dividend Per Share, Dividend Yield, Firm Value, Non- Financial Companies.**

I. INTRODUCTION

It has been well documented that the goal of management is to create value for shareholders; specifically, to maximize shareholder wealth (Lee & Lee, 2019). However, despite extensive theorizing and empirical research, considerable debate exists on whether dividend policy plays a role in achieving this goal. In this regard, Miller and Modigliani (1961) show that in a perfect world dividend policy has no effect on firm value and this has sprung up so much criticisms with the clause that we do not live in a perfect world. According to Egolum and Onyeogubalu (2021), investments in shares earn investment incomes to the investors and by their nature, they are generally very liquid. The investors can easily trade their ownership of stock and reap capital gains in the process. However, the impact of dividend per share on share prices of consumer goods firms has been of major interest to general public, regulatory authorities, academic communities and investors. Somewhat closer to the real world, Black (1976) argues that since dividends are tax disadvantaged when compared to stock repurchases dividends should have a negative effect on firm value. Although the percentage of public firms that pay dividends has declined since Black's time a substantial number of firms continue to pay dividends which leads to the question Why? (Fama & French, 2001)

Early literature on dividend policy presents two different views about the relationship between cash dividends and firm value. One view, attributed to Miller and Modigliani (1961) and echoed in Black (1976), suggests that dividends are irrelevant for firm value and possibly value-destroying. "The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together (Black 1976)" Another perspective, represented in the novel studies of Williams (1938), Lintner (1956), and Gordon (1959), considers dividends as an important determinant of firm value. Similarly, Baker and Weigand noted that firms are afraid of cutting dividends as the signaling effect will have a negative impact on stock price. Firms would rather manipulate stock price and sustain a higher stock price than what financial performance otherwise would produce. The essence of signaling theory is that a firm's management is likely to have private knowledge about the current and future situation of their company than outsiders will have (asymmetric information). Hence, dividend pay-outs may function as a signal of a company's financial health, with an increase in dividends indicating that managers expect their business to have a higher cash flow in the future. Consequently, a higher value is signalled by higher dividends.

Another major reason is that cutting dividends is often associated with a company having financial difficulties, therefore a dividend cut would likely lead to the market assuming there is trouble and inevitably start generating uncertainty (Lee & Mauck, 2016). More than this, the agency

theory suggests that unless earnings are distributed to outside shareholders, they might be diverted by managers for personal utility or committed to unprofitable ventures that provide private benefit for managers. As a result, agency cost implies that shareholders have a preference for dividends over profit, and firms with generous dividend payments will improve their value by decreasing the amount of funds available to managers (Ham, Kaplan & Leary, 2019). Hence, varying views and position gives room for further research in this area. Furthermore, as posited by Ilaboya and Aggreh (2013) and highlighted in the studies of Jakata and Nyamugnre (2015) there are limited studies as it relates to the effect of dividend policy on the value of a firm in emerging markets such as Nigeria.

Managers are in a dilemma about whether to pay a large, small or zero percentage of their earnings as dividends or to retain them for future investments. This is as a result of the need for management to satisfy the various needs of shareholders. For instance, shareholders who need money now for profitable investment opportunities would like to receive high dividends now. On the other hand, shareholders who would like to invest in the future will prefer dividends to be retained by the company and be reinvested which connote that dividend policy has potential implications on share prices (Press & Review, 2009). Most of the empirical studies support the traditional belief that there is statistically, a significant relationship between dividend policy and firm value. Studies conducted by Gul, Sajid, Razzez and Khan, (2012), Timothy and Peter, (2012), Odesa and Ekezie (2015), as well as Anike (2017) reported a significant negative relationship between dividend policy and firm performance. However, Amidu (2007), Ajanthan, (2013), Uwuigbe, Jafaru and Ajayi (2012), Haffees, Shahbaz, and Iftikhar and Buut (2018), as well as Priya and Nimalathasan (2013) reported a significant positive relationship between dividend policy and firm performance. Furthermore, most of these studies were conducted in advanced economies such as Pakistan, India, South Africa, USA, China and the UK. Few of these studies were conducted in developing economies such as Nigeria. We also noticed prominence in the use of dividend per share and earnings per share as measures of dividend policy and the accounting measure of return on asset as popular measurement for profitability. However, since these measurements are suitable and have been justified in prior related literature, we extend these popular measurements to include other established dividend policy and firm performance measurements to include; dividend yield and market to book ratio. It is against this backdrop that the study is intended.

Objectives of the Study

The main objective of this study is to examine dividend policy as determinants of firm value of listed firms in Nigeria. However, the specific objectives of the study are;

1. To examine the extent dividend payout determines firms' value of listed non-financial companies in Nigeria
2. To evaluate whether dividend per share determines firms' value of listed non-financial companies in Nigeria
3. To verify the extent dividend yield determines firm value of listed non-financial companies in Nigeria.

II. LITERATURE REVIEW

Concept of Firm Value

Firm value represents the assets owned by a company. It is crucial because it describes the prosperity of the business owners. The manager being the representative of the owners of the business is responsible for optimal maximization of the value of the firm which forms the fundamental objective of any organization (Bhabra, 2007). A high firm value indicates that the company is prosperous hence the shareholders' wealth is maximized indicating that the prosperity level of the shareholders and investors are reflected in the firms' value. Firm value is an indicator used to assess the performance of a company. Investors also perceive the company through its firm value, and this is related to its stock price. According to Ftouhi, Ayed and Zemzem (2015), higher stock price will make for higher firm value. Furthermore, Bhabra (2007) opined that firm value is the price paid by the wealthy buyer when a company is sold, and he also sees firm value as the objective value from the public and the orientation of company's survival.

Clearly, it is seen that firm value is the investors' perception towards a company's success level, and this is usually associated with stock price. Firm value is typically indicated by market to book value (MTBV). Accordingly, when this value is high this means that the principle of going concern is operational which translates into shareholders' wealth. Modigliani and Miller (1961) opined that firm value is determined by company's asset earnings power implying that, when the impact of asset earnings power is positive, the company is doing well, and its asset turnover will be more efficient, and this results in high profit. Firm value may be measured from two perspectives: from the point of view of accounting measure of profitability: return on assets (ROA), return on equity (ROE), Tobin's Q, net profit margin; and from the stock market perspective, using the share prices from the Stock Exchange market. This study adopts Market to book as a measure of firm value because of its popularity and wide acceptability.

Dividend Policy

Dividend policy indicates the disbursement policy, which directors follow in making decision of the pattern as well as size of cash supply to stockholders over a particular time (Kapoor, 2009). Dividend policy is a company's policy focusing on paying out salaries as dividend against retaining them for investment back in the company. It is the section of profit between expenditures to stockholders as well as reinvestment in the company (Lashgari & Ahmadi, 2014). A dividend policy is also defined as the strategy of action

accepted by the company's managements every time there is a choice to be made (Aduda & Kimathi, 2011). The main concern of a dividend policy decision is about how much incomes can be paid as dividend by the company and how much could be reserved (Emeni & Ogbulu, 2015). The determination of the dividends amount allocated is a significant decision that businesses assume because the aim of the company is to exploit the stockholders' capital (Waithaka et al., 2012). Firms usually come up with policies, which are meant to assist them in achieving their various goals using different approaches including stable predictable, constant pay-out and so forth (Aduda & Kimathi, 2011).

Dividend Per Share

Dividend is commonly defined as the distribution of earnings (past or present) in real assets among the shareholders of the firm in proportion to their ownership (Sujata, 2009). Therefore, distributions made out of the company's profits/earnings and the decision to pay out dividends is based on the firm's dividend policy. A dividend per Share (DPS) is the sum of dividends declared by a company divided by the number of outstanding ordinary shares issued. According to Hashim, Shahid, Sajid and Umair (2013), there are varied reasons why companies pay dividends. It may either be a way to reduce the rise in agency cost between managers and shareholders or to reduce the uncertainty of the investors of the company. If the goal of the investor is to receive returns on a continuous basis, he will prefer to invest in firms paying dividends. Dividends are mostly paid out by companies that are in a better cash position and whose earnings can be said to best able and sound (Kania & Bacon, 2005). According to Denis and Osobov (2008), large, mature and more profitable firms are thought to be highly probable to pay dividends as they can even source for such funds to pay out dividends from cheap external debt sources at their disposal.

A decision to pay dividends for the first time puts investors in an expectation mode for future dividends which can be an undoing for future company growth. Newly listed firms appear to fail to initiate dividend payments when, according to their characteristics, would be expected to do so (Joan, Roni & Schmalz, 2014). An increase in the amount of dividends paid also raises the investors‟ expectation bar for the company, and reducing or eliminating an existing dividend payment may have dire consequences on the share price. Tax implications may also be another factor in the firm's decision not to pay out dividends. This is known to be beneficial to the shareholders as the tax payable on dividends is high as compared to the capital gains tax payable on profits realized from the sale of an appreciated share (Litzenberger & Ramaswamy, 1979). This can be a very good tax management tool that the company can use to the benefit of its owners.

Dividend Yield

Dividend-yield is one of the most important financial ratios. The dividend-yield tells us how much the company pays out in dividends each year relative to its share price. There are different ways to interpret the dividend-yield. It is a controversial indicator since there is no consensus on how to interpret it. A high dividend yield implies that the company is of high risk and the prospect of the future is negative and therefore results in a price decrease of the share. The shareholders might be afraid that large amount of money disappears from the company in the form of dividends. The investors might believe the earnings would be better spent as retained earnings in order to invest in profitable investment opportunities. As a result, the investors would sell their equities and the stock price would decrease.

If a company has a low dividend-yield, the market participants might expect the company to be more profitable in the future. The market participants might assume the stock price will rise since the last years have been troublesome for the company. There are many explanations why the participants might have this expectation. One is that the stock market has been in an economic downturn and it is about to rise again. - A low dividend-yield could also imply that the company is struggling and is neither profitable nor has a positive prospect of future. The market participants assume the management of the company has inside information about the future, hence low dividend-yield might be interpreted as distressed times are coming. The effect of this interpretation is that the shareholders sell the equities and as a result, the stock price decreases. However, this effect might only be temporary if the distressed times does not materialize (Black & Scholes, 1973).

Dividend Pay-Out

Dividend pay-out are important to shareholders and potential investors in showing the earnings that a company is generating. Healthy dividends pay-outs thus indicate that companies are generating real earnings rather than cooking books (Barron, 2002). A study by Zhou & Ruland (2006) revealed that high dividend pay-out firms tend to experience strong future earnings but relatively low past earnings growth. The findings of another study done by Arnott & Asness (2003) also revealed that future earnings growth is associated with high rather than low dividend pay-out. They concluded that historical evidence strongly suggests that expected future earnings growth is fastest when current pay-out ratios are high and slowest when pay-out ratios are low. Their evidence contradicted the view that substantial reinvestment of retained earnings would fuel faster future earnings growth.

Low dividend resulting in low growth may be as a result of suboptimal investment and less than ideal projects by managers with excess free cash flows at their disposal. This is prominent for firms with limited growth opportunities or a tendency towards over-investment. Paying substantial dividends which in turn would require managers to raise funds from issuance of shares, may subject management to more scrutiny, reduce conflicts of interest and thus curtail suboptimal investment (Arnott & Asness, 2003). This is based on the assumption that suboptimal investments lay the foundation for poor earnings growth in the future whereas discipline and a minimization of conflicts will enhance growth

of future earnings through carefully chosen projects. *Therefore, paying dividends to reduce the free cash flows enhances the performance of a company since managers will have less cashflows thus avoiding suboptimal investments*.

Dividend Policy and Firm Value: A Synthesis

Numerous theories as well as models have been recognized on the significance as well as insignificance of dividend policy. Furthermore, writers continue to develop conclusions with respect to dividend policy from their experiential researches (Thafani & Abdullah, 2014). For instance, Miller and Modigiliani (1961) under the dividend irrelevance theory show that under certain simplifying assumptions, a company's dividend rule does not influence its worth hence irrelevant. On the other hand, Gordon (1962), Lintner (1963), Ross (1977) and other scholars argue that dividend policy affect the value of the firm hence relevant. According to Deeptee and Rosan (2009), the dividend policy choice for the company is very significant and therefore, the way bosses go about creating dividend policy choices as well as if or not they monitor a particular set of policies or precise plans to make these adoptions will influence the firm's value. Khan, (2012) also explains that in the business' viewpoint, choosing an appropriate dividend policy is a significant choice for the firm due to the fact suppleness to invest in forthcoming projects depends on the dividend amount which they pay to their stockholders. As such, companies in designing their dividend policies consider certain significant features such as decision-making as well as behavioural environment, companies' productivity proportions, and the willingness of the company. In this regard, Thafani and Abdullah (2014) revealed an association between dividend disbursement and company productivity in terms of return on assets, return on equity and incomes per share while similar study of Aroni, Namusonge and Sakwa (2014); Adefila et al. (2010); Ozuomba, Okaro and Okoye (2013); Oladele (2013) noted a significant relationship with creation of value.

Signalling Theory

The signalling theory of dividends has its origins in Lintner, (1956) studies who revealed that the price of a company's stocks usually changes when the dividend payments changes. Even though Modigliani & Miller (1961) argued in favour of the dividend irrelevance they also stated that in the real world disregarding the perfect capital markets, dividend provides an "information content" which may affect the market price of the stock. Many researchers have thereafter been developing the signalling theory and today it is seen as one of the most influential dividend theories. (Bhattacharya, 1979) presented one of the most acknowledged studies regarding signalling theories which states that dividends may function as a signal of expected future cash flows. An increase in the dividends indicates that the managers expect higher cash flows in the future. The theory is based on the assumptions that outside investors have imperfect information regarding the company's future cash flows and capital gains. Another important assumption is that dividends are taxed at a higher rate compared to capital gains. Bhattacharya (1979) argues that under these circumstances even though there is a tax disadvantage for dividends, companies would choose to pay dividends in order to send positive signals to shareholders and outside investors. Many studies have been conducted in order to test if the signalling theory applies in the real world and there exist different opinions regarding the applicability of the signalling theory. Asquith & Mullins Jr (1983) provided empirical evidence in favour of the signalling theory. They argue that an increase of dividend payments tends to increase the shareholders' wealth.

Empirical Review

Egolum and Onyeogubalu (2021), examined the impact of quantitative factor, dividend per share (DPS) on determination of share prices of the selected consumer goods firms listed in the Nigeria Stock Exchange over the period 2009-2018. One hypothesis anchoring on the impact of independent variable DPS on the share prices was formulated for testing in this study. Judgmental sampling technique was adopted in the study. Annual financial statements of the selected firms were used for the study. Ratio analysis, correlation and linear regression models were used to measure the impact of the independent variable on the Share price (SP), the dependent variable. Paired sample t-test was used to test the hypotheses at 5% level of significance. The empirical findings show that, there is a positive correlation between the independent variable (DPS). DPS is accountable for about 21.7% changes in the share prices of consumer goods firms listed in the Nigeria Stock Exchange. Investors are enjoined to carefully scrutinize the trend in the DPS of the consumer goods company listed in Nigeria Stock Exchange among other variables before investing their funds; doing so will lead them to making good and viable investment decisions. Management of the consumer goods firms should also strive to operate optimal dividend policy that will not be detrimental to the share price of its organization**.**

Gul, Sajid, Razzaq, Iqbal, & Khan (2012) conducted a study in Pakistan testing the relationship between dividend policy and shareholders' wealth. The study is based on a sample of 72 companies listed on the Karachi Stock Exchange from 2005-2010. The authors used multiple regression and stepwise regression method to study the impact of dividend policy on shareholders' wealth. Market value of equity is the depended variable; a proxy for measuring shareholders' wealth. The independent variables include dividend per share, retained earnings, lagged price to earnings ratio and lagged market value of equity. Dividend per share is used as a proxy for measuring the dividend policy of a firm. The fixed effect regression result show that the market value of companies that pay dividends is well above the book value as compared to companies that do not pay dividends. They reported that there is a significant difference between shareholders' wealth in companies that pay dividends than those that do not pay dividends.

Timothy and Peter (2012), determined the relationship between dividend pay-out and firm performance of listed firms on the Nairobi Securities Exchange during the period of 2002 - 2010. The Dependent Variable used is ROA, while the Independent Variables is dividend pay-out. The multiple regression analysis employed indicated that dividend pay-out is a major factor affecting firm profitability measured by net profit after tax. The relationship is also strong and positive indicating that dividend policy is relevant.

Odesa and Ekezie (2015), examined the factors that determine dividend policy of listed companies in Nigeria. The study used descriptive and ex-post facto research design together with regression analysis to test the relationship between the variables. The study revealed that investment opportunity has a negative relationship with dividend policy whereas debt, return on equity, structure of shareholder, and last paid dividend have a significant positive relationship with dividend policy. The study recommended among others that managers should pay more attention to profit, total debt, shareholder structure and last dividend paid in formulating dividend policy as this will help reduce principal-agent conflict and ultimately enhance the value of the firm.

Anike (2017), examined effect of dividend policy and earnings on share prices of Nigerian banks. The study adopted ex-post-facto research design and panel data covering 5- year period 2006-2010 which were collected from banks annual reports. The study findings established that dividend yield had negative significant effect on banks' share prices. In addition, earnings yield had negative significant effect on banks' share prices and dividend pay-out ratio had negative non-significant effect on banks' share prices. The result of the ordinary least square (**OLS)** regression revealed that dividend yield, earnings yield and dividend pay-out ratio are not factors that influences share prices during the period under investigation.

Amidu (2007), investigated whether dividend policy influences firm performance in the Ghana Stock Exchange. The study found that dividend policy affects firm performance especially the profitability measured of return on assets. The results showed a positive and significant relationship between return on assets, return on equity, growth in sales and dividend policy. This showed that when a firm has a policy to pay dividends, its profitability is influenced.

Husain, Sunardi, Lisdawati (2020) aimed to empirically prove the effect of dividend policy on firm value. Firm value is measured using Price-to-Book Value (PBV) Approach. The study included a sample of 11 firms under the automotive and components sib sector listed in the Indonesia Stock Exchange. It included data for the period of 2014-2018. It equally applied path analysis using the Sobel test of the direct and indirect effects. The study finds that Dividend Policy has no significant effect on Firm's Value.

Ajanthan (2013), investigated the relationship between dividend pay-out policy and firm profitability among listed hotels and restaurant companies in the Colombo Stock Exchange (CSE). Regression and correlation analysis were carried out to establish the relationship between dividend pay-out and firm profitability. The findings indicated that dividend pay-out is a crucial positive factor affecting firm performance indicating that dividend policy is relevant. Based on the findings the authors recommended that managers should pay attention and devote adequate time in designing a dividend policy that will enhance firm profitability which will ultimately improve shareholder value.

Uwuigbe, Jafaru and Ajayi (2012) investigates the relationship between financial performance and dividend pay-out among listed firms in Nigeria. The annual reports for the period 2006-2010 were utilized as the main source of data collection for 50 sampled firms. Regression analysis was employed as a statistical analyses technique on the data collected. The study finds that there is a significant positive association between performance of firms and dividend pay-out of the sampled firms.

Hafeez, Shahbaz, Iftikhar and Butt (2018), investigated the relationship between dividend policy and firm performance. The sample contain 15 manufacturing companies for year 2014 to 2017. Return on asset (ROA) and return on equity (ROE) were used as dependent variables while dividend pay-out ratio, earning per share (EPS), price earnings ratio (PER) is modelled as independent variables. Multiple regressions, correlation and descriptive statistics were used as data analysis techniques. Findings reveal that all the independent variable have a positive relationship with dependent variables. Dividend pay-out ratio, earning per share, price earnings ratio positively influence return on investment.

Priya and Nimalathasan, (2013), analysed the relationship between Dividend Policy Ratios and Firm Performance during 2008 to 2012 financial year of Selected Hotels & Restaurants in Sri Lanka. Data for the study were extracted from annual reports of sampled companies. Correlation and multiple regression analysis results revealed that dividend policy ratios have a great impact on all firm performance ratios except return on investment (ROI) and return on equity (ROE).

Hasan, Ahmad, Rafiq, and Rehman (2015), investigated the relationship between dividend pay-out ratio and profitability of a firm. Two main sectors of Pakistan were selected, energy and textile. The study covers a time span of 1996-2008. Firm performance is measured by earning per share (EPS) and return on assets (ROA). The OLS regression results show that no matter what industry is, there is a negative impact of dividend pay-out ratio on next year earnings of a firm.

III. RESEARCH METHODOLOGY

This study used ex-post facto research design due to its wide acceptability in studies of this nature. This study employed secondary information sourced from the Nigerian Stock Exchange Fact books and related companies' annual financial reports for the study periods which has been justified by recent study. The population of this study is made up of all non-financial companies listed on the Nigerian Stock

exchange for the period 2010 to 2019. However, as of 31st December 2019, there were 106 non-financial companies quoted on the floor of the Nigerian stock exchange market.

Consumer Services Sector	=	15
Healthcare Sector	=	10
Basic Materials Sector	=	11
Consumer Goods Sector	=	26
Industrial Sector	=	24
Oil & Gas Sector	=	13
Technology Sector	=	07
Total	=	106

Source: Nigerian Stock Exchange (NSE) Website.

The Krejcie and Morgan's sample size calculation is based on p = 0.05 where the probability of committing type I error is less than 5 % or p <0.05.

$S = X^2 NP (1- P) / d^2 (N - 1) + X^2 P (1 - P)$

Where,

S = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (0.05 = 3.841).

N = the population size.

P = the population proportion (assumed to be 0.50 since this would provide the maximum sample size.

d = the degree of accuracy expressed as proportion (0.05).

The expected sample size shall be:

S = 3.841 x 106 x 0.5 x 0.5 / $(0.05)^2$ x 106 + 3.481 x 0.5 x 0.5

S = 101.7865 / 0.265 + 0.87025

S = 101.7865 / 1.13525

S = 89.66

S = 90

Sampling Technique

In order to avoid sample bias, the simple random sampling technique is adopted to select listed non-financial companies that formed the sample size. The specific random sampling method to be adopted is the balloting or hand drawing method. This is preferred to other methods of simple random sampling because it is easy to use, less costly; less time consuming and less complex Succinctly, the researcher deselects 9 non-finance firms bringing the final sample size for this study to 81 non-finance firms. The 9 firms were deselected on the basis that they got listed on the Nigerian stock exchange market after the study period (2010). This enabled the researcher to obtain a balance panel for the analyses.

Model Specification

This study has specified Firm value as a function of a set of dividend policy measures taken as;

Dividend Policy Firm Value Model

$MTBV_{it} = \beta_0 + \beta_1 DIPS_{it} + \beta_2 DIYD_{it} + \beta_3 DIVPAY_{it} + ROE_{it} + e_{it}$

Where;

Dependent Variable

MTBV = Market to Book Value

Independent Variables

DIPS = Dividend per share

DIYD = Dividend yield

DIVPAY= Dividend pay-out

Control Variable

ROE = Return on Equity

"i" for cross sections (firms in the study)

"t" for time period

e_{it} for error term

Operationalization of Variables

Table 1: Variables, Measurements and Justification

Variables	Measurement	Source
MTBV (Dependent Variable)	Book to Market value in numbers is computed as total equity divided by market capitalisation.	Frank. & Goyal, (2007).
Dividend per share (Independent Variable)	Cash dividend per share in per share basis is computed as cash dividend paid divided by outstanding shares	Huang & Kisgen, 2013
Dividend yield (Independent Variable)	Cash dividend yield in percentage is computed as cash dividend paid divided by Market capitalisation	Huang & Kisgen, 2013
Dividend pay-out (Independent Variable)	Cash dividend pay-out in percentage is computed as cash dividend paid divided by profit after tax	Huang & Kisgen, 2013
Return on Equity (Control Variable)	Return on equity in percentage is computed as profit after tax divided by Total equity	Rono, (2018)

Source: Researcher's Compilation 2021

IV. DESCRIPTIVE STATISTICS

Table 2: Descriptive Statistics by firm year category

year	MTBV	DIPS	DIYD	DIVPAY	ROE
2010	.8311111	.6702469	2.529136	29.12901	24.03716
	19.51395	1.856816	2.892582	41.04758	75.76735
	-168.66	0	0	-107.07	-236.44
	20.77	10.6	10.55	172.53	591.51
	67.32	54.29	204.86	2359.45	1947.01
2011	-7.77642	.7032099	3.501605	48.03469	869.7262
	90.96884	1.833807	4.97152	176.4061	7743.657
	-816.01	0	0	-110.61	-331.72
	15.22	11.14	32.16	1566.6	69701.14
	-629.89	56.96	283.63	3890.81	70447.82
2012	2.884568	.7887654	3.317901	67.4716	-12.27395
	4.37539	2.008961	4.171245	334.731	142.7601
	-1.09	0	0	-35.03	-981.37
	27.52	11.17	19.89	3013.88	99.73
	233.65	63.89	268.75	5465.2	-994.19
2013	2.510741	.7933333	2.323086	30.42123	26.33519
	5.924034	2.568	3.057389	42.89632	103.3919
	-23.61	0	0	-109.42	-28.44
	26.8	20.43	15.66	175.35	905.42
	203.37	64.26	188.17	2464.12	2133.15
2014	-12.03852	1.220247	3.349753	43.08099	-2.961852
	131.0337	4.008698	3.611047	58.45531	94.93818
	-1176.19	0	0	-48.46	-707.87
	22.31	32.93	14.47	332.66	140.82
	-975.1199	98.84	271.33	3489.56	-239.91
2015	3.905802	.8728395	3.493827	35.29975	115.0317
	11.89885	2.651152	4.211573	59.66485	1148.387
	-14.44	0	0	-166.08	-989.38
	75.57	20.37	18.02	225.69	10264.72
	316.37	70.7	283	2859.28	9317.57
2016	1.227654	.8658025	2.833951	9.071605	4.274691
	5.160366	3.154368	3.742121	121.2968	37.77353
	-36.47	0	0	-935.63	-137.65
	20.79	25.33	18.74	253.4	104.49
	99.44	70.13	229.55	734.8	346.25
2017	1.639259	.8653086	2.571728	33.56593	12.72593
	4.402366	2.836685	5.029606	67.16167	81.18529
	-19.73	0	0	-97.96	-227.74
	27.48	19.34	38.26	322.52	480.55
	132.78	70.09	208.31	2718.84	1030.8
2018	2.674935	1.481081	4.317973	29.94117	-21.16234
	12.11943	6.712151	8.887016	178.8264	227.7079
	-9.79	0	0	-363.52	-1964.35
	103.9	56.21	51.72	1452.19	85.64
	205.97	109.6	319.53	2305.47	-1629.5
Total	-.477393	.91241	3.126219	36.25866	113.5986
	54.067	3.334046	4.770095	150.6246	2618.475
	-1176.19	0	0	-935.63	-1964.35
	103.9	56.21	51.72	3013.88	69701.14
	-346.11	658.76	2257.13	26287.53	82359

Source: Authors Computation (2021) STATA'16 Output

From the table above, it is observed that on average, market to book showed values of 0.83 in year 2010, 2.88 in year 2012 and 2.51 in year 2013. In year 2015 the average vale of market to book is seen to be 3.91 while in year 2016 it is seen to be 1.28. However, in year 2017 the value of market to book ratio revealed in the descriptive statistics is observed to be 1.64 while 2.67 happened to be the average for year 2018. However, we observe that on average, market to book value is negative in year 2011 (-7.78), and in year 2014 (-12.04).

Also, we noticed that average value of dividend per share during the period increased from 0.67 in year 2010, to 0.70 in year 2011, and 0.79 in year 2012 to 0.79 in year 2013. The descriptive statistics also reveal that in year 2014, the average value of dividend per share stood at 1.22, 0.87 in year 2015, 0.87 in year 2016, 0.87 in year 2017 and 1.48 in year 2018 which implies that dividend paid for every unit of shares increased over time. For the variable of dividend yield, it is observed that on average, it stood at 2.53 in year 2010 compared to 3.50 in year 2011, 3.32 in year 2012, 3.32 in year 2013, 3.35 in year 2014, 3.49 in year 2015, 2.83 in year 2016, 2.57 in year 2017 and 4.32 in year 2018. The table also shows that on average, dividend pay-out for the firms under consideration is 29.13 in year 2010, 48.03 in year 2011, 67.47 in the year 2012, 30.42 in year 2013, 43.08 in year 2014, 35.30 in year 2015, 9.07 in year 2016, 33.57 in year 2017, 29.94 in year 2018.

Test for Normality Residua

One of the assumptions of ordinary least squares regression is that the data is normally distributed. The researchers tracked the results of Mendes and Pala (2003), and they concluded that the Shapiro-Wilk test is the most powerful normality test. Therefore, the researchers conducted a residual normality test, as shown in the table below.

Table 3: Normality of Residua Analyses Result

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
MTBV	725	0.06346	440.892	14.877	0.00000
DIPS	722	0.31282	322.285	14.109	0.00000
DIYD	722	0.72595	128.529	11.863	0.00000
DIVPAY	725	0.27846	339.675	14.240	0.00000
ROE	725	0.02631	458.381	14.972	0.00000

Source: Authors Computation (2021) STATA'16 Output

From the table above, it is observed that the dependent variable of market to book value (Prob > z = 0.00000) is not normally distributed since the probability of the z-statistics is significant at 1%. The same can be said for the independent variables of Dividend Per Share (Prob > z = 0.00000), Dividend Yield (Prob > z = 0.00000) and Dividend Pay-out (Prob > z = 0.00000). The control variable of profitability proxied by return on equity follows a non-normal distribution as well (Prob > z = 0.00000). This interpretation is justified following the study of Bera and Jarque (1982).

Correlation Analysis

Although the concepts of correlation and regression are intimately related, nevertheless they are different (Warren, 1971). Correlation may be described as the degree of association between two variables, whereas regression expresses the form of the relationship between specified values of one (the independent, exogenous, explanatory, regression, carrier or predictor) variable and the means of all corresponding values of the second (the dependent, outcome, response variable; variable being explained) variable. In general, the study of interdependence leads to the investigation of correlations (Moore, 1980), while the study of dependence leads to the theory of regression. When the x variable is a random covariate to the y variable, that is, x and y vary together (continuous variables), we are more interested in determining the strength of the linear relationship than in prediction, and the sample correlation coefficient, r_{xy} (r), is the statistics (Aknazarova & Kafarov 1982). Generally, the literature suggests that extremely non-normal distributions can sometimes inflate Type I error rates for tests of the Pearson correlation coefficient and increasing sample size does not necessarily alleviate this problem. The power benefit of Spearman's r may be the result of rank-ordering causing outliers to contract toward the centre of the distribution (Fowler, 1987; Gauthier, & Kupka, 2001). Upon this understanding and based on the fact that the data set followed a non-normal distribution, we employ the Spearman Rank Correlation technique to conduct the possible association between the variables of interest shown in the table below:

Table 4: Spearman Rank Test for Correlation

Key
rho
Number of obs
Sig. level

	MTBV	DIPS	DIYD	DIVPAY	ROE
MTBV	1.0000				
	722				
DIPS	0.4333	1.0000			
	722	722			
	0.0000				
DIYD	0.1334	0.7901	1.0000		
	722	722	722		
	0.0003	0.0000			
DIVPAY	0.3165	0.7319	0.7220	1.0000	
	722	722	722	722	
	0.0000	0.0000	0.0000		
ROE	0.2809	0.3953	0.2444	0.3729	1.0000
	722	722	722	722	722
	0.0000	0.0000	0.0000	0.0000	

Source: Authors Computation (2021) STATA'16 Output

Specifically, the analysis from the spearman rank correlation showed that all the independent variables and the control variable employed in this study exerts a positive association with firm value proxied by market to book value. This is revealed as; Dividend Per Share (0.4333), Dividend Yield (0.1334), Dividend Pay-out Ratio (0.3165) and the control variable of return on equity (0.2809). However, we find that the strength of all the associations is seen to be relatively weak since they are less than 80% where the suspicion for the presence of multicollinearity in the estimated model becomes high.

Regression Analysis

The study carries out Pool Least Square Regression analysis and proceed to check if the basic assumption of the pool least square regression has been violated. The results obtained from the pool least square regression is as shown in the table below;

Table 5: Panel Least Square Regression

Source	SS	df	MS	Number of obs	=	722
				F(4, 717)	=	78.77
Model	646096.289	4	161524.072	Prob > F	=	0.0000
Residual	1470328.76	717	2050.66773	R-squared	=	0.3053
				Adj R-squared	=	0.3014
Total	2116425.05	721	2935.40229	Root MSE	=	45.284

MTBV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
DIPS	.7413825	.5119271	1.45	0.148	-.2636728	1.746438
DIYD	.139647	.366586	0.38	0.703	-.5800633	.8593572
DIVPAY	.0014835	.01159	0.13	0.898	-.021271	.0242379
ROE	-.0113472	.000643	-17.65	0.000	-.0126096	-.0100849
_cons	-.3525713	2.048067	-0.17	0.863	-4.373497	3.668354

Source: Authors Computation 2021 STATA'16 Output

Diagnostic Test

Test for Multicollinearity

Multicollinearity is viewed as an interdependency condition. It is defined in terms of a lack of independence, or of the presence of interdependence signified by high intercorrelations within a set of variables, and under this view can exist quite apart from the nature, or even the existence of a dependency relationship between the independent and a dependent variable. In this study like in most other related studies, the researcher employs the variance inflation factor (VIF) technique to diagnose the presence or absence of multicollinearity in the market to book value/dividend policy model. A cut-off value of 0.44 is given for regarding a VIF as high. Specifically, the researcher follows Gujarati (2004) which allows VIF to be less than 5. However, the result showed that VIF (1.04) is less than five (5) for all independent variables of interest as shown in the appendix.

Test for Fixed and Random Effects

The fixed-effects model, which is the key technique for panel data analysis, is used when it becomes necessary to monitor for omitted variables that vary between cases but are constant over time, as noted by Ajibolade and Sankay (2013). In this study, a 0.05 level of significance, the Wallace and Hussain estimator of component variances (a two-way random and fixed effects panel) was used. Fixed effect estimator helps you to estimate the effects of the predictor (independent) variables on the outcome (dependent) variable by using changes in the variables over time. The random-effects model, on the other hand, is used when there are reasonable grounds to assume that certain omitted variables are constant over time but differ between cases, and others are fixed between cases but vary over time. When using this method, researchers are normally given the option of using either the fixed-effect panel model or the random-effect panel model over time.

As a result, scholars often recommend the Hausman specification test to explain model selection (Gujarati, 2004). In fact, this test compares a more efficient model to a less efficient but reliable model. It guarantees that the more effective model produces reliable results as well. It examines the null hypothesis that the effective random-effects estimator's coefficients are identical to those determined by the consistent fixed-effects estimator. It is safe to use random effects if the p-value > is greater than.05, but if the p-value is less than.05, the fixed-effects model should be used (Gujarati, 2004; Ajibolade & Sankay, 2013). However, a careful examination of the results provided by the effects models show that there is no fixed effect or random effects in the model. This is revealed by the probability of the F-Statistics from fixed effect regression and random effect regression.

Test for Homoscedasticity

When data come from a normally distributed population, rejection of the Breusch-Pagan test implies non-homogeneity of covariances. However, if the population distribution is not known, then rejection of the Breusch-Pagan test can be due to either non-normality or non-homogeneity of covariances. In general, one does not know whether the data are normally distributed. First, the researcher applies the Breusch-Pagan test. If the test is not rejected, then there is no ground to suspect non-normality or heterogeneity of covariances. On the other hand, if the Breusch-Pagan test is rejected, then apply a nonparametric test of homoscedasticity. The result obtained from the regression reveals a probability value of (P-value: 0.000) obtained from the Breusch-Pagan test. This result indicate that the assumption of homoscedasticity is been violated due to very low P-values which is statistically significant at 1% level. However, to correct for this violation the researcher employs the robust standard error regression as recommended by Greene, (2003) and shown in table 4.5 below;

Table 6: Robust Panel Least Square Regression

```
Robust regression                               Number of obs     =        721
                                                F(  4,      716)  =    1019.07
                                                Prob > F          =     0.0000

------------------------------------------------------------------------------
        MTBV |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        DIPS |   .7692219   .0124106    61.98   0.000     .7448564    .7935873
        DIYD |  -.0500436   .0088876    -5.63   0.000    -.0674925   -.0325947
      DIVPAY |  -.0000944   .0002809    -0.34   0.737    -.0006459    .0004572
         ROE |  -.0015337   .0001024   -14.97   0.000    -.0017348   -.0013326
       _cons |   1.098294   .0496793    22.11   0.000     1.000759    1.195828
------------------------------------------------------------------------------
```

Source: Authors Computation (2021) STATA'16 Output

Robust Standard Error Estimator

Ordinary Least square estimation in a linear model has been established as not robust to outliers this is because a single atypical observation can in fact cause this estimator to break down. Furthermore, the least square estimator requires a moment condition on the error distribution to be consistent. However, robust regression estimators have been introduced to overcome these problems, and they have become a standard

tool in regression analysis. In this situation, normality of the error terms is in fact not needed; nor does any moment need to exist when applying robust estimators. The standard approach to statistical inference based on robust regression methods is to derive the limiting distribution of the robust estimator and to compute the standard errors of the estimated regression coefficients. The robust standard errors remain valid when the error terms are not independent and identically distributed (i.i.d) but suffer from heteroskedasticity or autocorrelation. A robust standard error consistently estimates the true standard error even in the face of non i.i.d. error terms. The most popular robust standard errors in econometrics are the White or Eicker-White standard errors (attributed to Eicker, 1967, and White, 1980), which protect against heteroskedasticity and the Newey-West standard errors (Newey and West, 1987), which are heteroskedasticity and autocorrelation consistent (HAC) estimates of the standard error. Hence, an important property of robust standard errors is that the form of the heteroskedasticity and/or autocorrelation does not need to be specified. Therefore, due to the presence of heteroscedasticity obtained from the panel least square regression estimator, the researcher proceeds to employ the Eicker-White standard errors which is relied upon for hypotheses testing presented below:

Test of Hypotheses

Hypotheses 1: *Dividend pay-out ratio does not significantly determine firm value of listed non-finance firms in Nigeria.*

The results obtained from the robust least square regression model revealed that dividend pay-out is an insignificant determinant of market to book value proxy of firm value during the period under investigation. This is shown as; DIVPAY (Coef. = -0.0001, t = -0.34 and P -value = 0.737). Following the results above, it is revealed that dividend pay-out ratio cannot determine firm value. This finding is consistent with the stated null hypothesis which leads to its acceptance. Hence, we note that dividend pay-out ratio does not determine firm value of listed non-finance firms in Nigeria.

Hypotheses 2: *Dividend Per Share does not significantly determine firm value of listed non-finance firms in Nigeria.*

The results obtained from the robust least square regression model revealed that dividend per share is a significant positive determinant of market to book value proxy of firm value during the period under investigation. This is shown as; DIPS (Coef. = 0.7692, t = 61.98 and P -value = 0.000). Following the results above, it is revealed that dividend per share can determine firm value. This is positive and significant at 1% level. This finding is inconsistent with the stated null hypothesis which leads to its rejection, hence, accepting the alternate hypotheses that dividend per share significantly determine firm value of listed non-finance firms in Nigeria.

Hypotheses 3: *Dividend yield does not significantly determine firm value of listed non-finance firms in Nigeria.*

The results obtained from the robust least square regression model revealed that dividend yield is a significant negative determinant of market to book value proxy of firm value during the period under investigation. This is shown as; DIYD (Coef. = -0.0500, t = -5.63 and P -value = 0.000). Following the results above, it is revealed that dividend yield can determine firm value. This is negative and significant at 1% level. This finding is inconsistent with the stated null hypothesis which leads to its rejection and the acceptance of the alternate hypotheses that dividend yield significantly determine firm value of listed non-finance firms in Nigeria though negatively.

III. DISCUSSION OF FINDINGS

In corporate finance, the finance manager is generally thought to face two operational decisions: the investment (or capital budgeting) and the financing decisions. Capital budgeting decision is concerned with what real assets the firm should acquire while the financing decision is concerned with how these assets should be financed. A third decision may arise, however, when the firm begins to generate profits. Should the firm distribute all or proportion of earned profits in the form of dividends to the shareholders, or should it be ploughed back into the business? Surprisingly, we find that dividend pay-out is not a significant determinant of firm value. However, a study by Zhou & Ruland (2006) revealed that high dividend pay-out firms tend to experience strong future earnings but relatively low past earnings growth despite market observers having a contradicting view.

The findings from this study also reveals that dividend per share is a significant determinant of firm value. This is a potential implication for share prices and hence, returns to investors, the financing of internal growth and equity base through retentions together with its gearing and leverage (Omran & Pointon, 2004). This finding contradicts prior studies of Black 1976; DeAngelo 1996; Farsio et al 2004; Amidu 2007; Howatt et al 2009; Adefila 2012 who noted that firm value is mainly influenced by growth in sales, improvement in profit margin, capital investment decisions and capital structure decisions. In this study, dividend yield is also seen as a determinant of firm value. However, the results of this findings indicates that dividend yield negatively determines firm value. This contradicts prior findings of Litzenberger and Ramaswamy (1979), Blume (1980), Hodrick (1992), Naranjo et al. (1998), and Lewellen (2004) who reported a strong positive relationship between expected returns as a measure of firm value and dividend yields. Furthermore, Fama and French (1988) report that the power of dividend yields to forecast firm value in stock return increases with the return horizon. Specially, we find that increased dividend yield of non-finance firms in Nigeria does not necessarily increase firm value.

IV.CONCLUSION AND RECOMMENDATION

The issue of dividend policy in corporate organization in both developed and developing countries has been of great concern

globally. Several theories have been proposed to explain the relevance of dividend policy and whether it affects firm value, but there has not been a universal agreement. This is more so because managers as decision makers are often confronted with the "dividend puzzle" which is the problem of reconciling observed dividend behaviour with economic incentives (Adeyemi & Adewale, 2006). Hence, dividend policy is considered as a hinge around which other financial policies rotate. For this reason, it is central to performance and valuation of firms. Consequently, there has been an unresolved problem on dividend relevance and/or irrelevance in the determination of firms' performance and value.ss from the findings, we conclude that dividend yield and dividend per share are determinants of firm value. However, dividend pay-out ratio is not a significant determinant of firm value in Nigeria. It is recommended that management should concert policies and efforts which will reduce profits share to investors and redirect those funds as retained earnings for the purpose of growing the company.

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APPENDIX (A)

```
___  ____  ____  ____  ____ (R)
/__    /   ____/   /   ____/
___/   /   /___/   /   /___/   16.0   Copyright 1985-2019 StataCorp LLC
  Statistics/Data Analysis            StataCorp
     MP - Parallel Edition            College Station, Texas 77845 USA
                                      800-STATA-PC        http://www.stata.com
                                      979-696-4600        stata@stata.com
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               eData Value Associates, Benin City

Notes:
      1.  Unicode is supported; see help unicode_advice.
      2.  More than 2 billion observations are allowed; see help obs_advice.
      3.  Maximum number of variables is set to 5000; see help set_maxvar.

. *(8 variables, 729 observations pasted into data editor)

. tabstat MTBV DIPS DIYD DIVPAY ROE, statistics( mean sd min max sum ) by(year)

Summary statistics: mean, sd, min, max, sum
 by categories of: year (Year)
```

APPENDIX (A) CONT'D

year	MTBV	DIPS	DIYD	DIVPAY	ROE
2010	.8311111	.6702469	2.529136	29.12901	24.03716
	19.51395	1.856816	2.892582	41.04758	75.76735
	-168.66	0	0	-107.07	-236.44
	20.77	10.6	10.55	172.53	591.51
	67.32	54.29	204.86	2359.45	1947.01
2011	-7.77642	.7032099	3.501605	48.03469	869.7262
	90.96884	1.833807	4.97152	176.4061	7743.657
	-816.01	0	0	-110.61	-331.72
	15.22	11.14	32.16	1566.6	69701.14
	-629.89	56.96	283.63	3890.81	70447.82

2012 | 2.884568 .7887654 3.317901 67.4716 -12.27395
| 4.37539 2.008961 4.171245 334.731 142.7601
| -1.09 0 0 -35.03 -981.37
| 27.52 11.17 19.89 3013.88 99.73
| 233.65 63.89 268.75 5465.2 -994.19
---------+---
2013 | 2.510741 .7933333 2.323086 30.42123 26.33519
| 5.924034 2.568 3.057389 42.89632 103.3919
| -23.61 0 0 -109.42 -28.44
| 26.8 20.43 15.66 175.35 905.42
| 203.37 64.26 188.17 2464.12 2133.15
---------+---
2014 | -12.03852 1.220247 3.349753 43.08099 -2.961852
| 131.0337 4.008698 3.611047 58.45531 94.93818

APPENDIX (A) CONT'D

| -1176.19 0 0 -48.46 -707.87
| 22.31 32.93 14.47 332.66 140.82
| -975.1199 98.84 271.33 3489.56 -239.91
---------+---
2015 | 3.905802 .8728395 3.493827 35.29975 115.0317
| 11.89885 2.651152 4.211573 59.66485 1148.387
| -14.44 0 0 -166.08 -989.38
| 75.57 20.37 18.02 225.69 10264.72
| 316.37 70.7 283 2859.28 9317.57
---------+---
2016 | 1.227654 .8658025 2.833951 9.071605 4.274691
| 5.160366 3.154368 3.742121 121.2968 37.77353
| -36.47 0 0 -935.63 -137.65
| 20.79 25.33 18.74 253.4 104.49
| 99.44 70.13 229.55 734.8 346.25
---------+---
2017 | 1.639259 .8653086 2.571728 33.56593 12.72593
| 4.402366 2.836685 5.029606 67.16167 81.18529
| -19.73 0 0 -97.96 -227.74
| 27.48 19.34 38.26 322.52 480.55
| 132.78 70.09 208.31 2718.84 1030.8
---------+---

```
 2018 |  2.674935  1.481081  4.317973  29.94117 -21.16234
      |  12.11943  6.712151  8.887016  178.8264  227.7079
      |    -9.79         0         0  -363.52  -1964.35
      |     103.9     56.21     51.72  1452.19     85.64
      |    205.97     109.6    319.53  2305.47   -1629.5
---------+--------------------------------------------------
```

APPENDIX (A) CONT'D

```
Total |  -.477393    .91241  3.126219  36.25866  113.5986
      |    54.067  3.334046  4.770095  150.6246  2618.475
      |  -1176.19         0         0  -935.63  -1964.35
      |     103.9     56.21     51.72  3013.88  69701.14
      |  -346.11    658.76   2257.13  26287.53     82359
-------------------------------------------------------------
```

```
. . swilk MTBV DIPS DIYD DIVPAY ROE

                Shapiro-Wilk W test for normal data

    Variable |       Obs       W          V         z       Prob>z
-------------+-------------------------------------------------------
        MTBV |       725    0.06346    440.892    14.877    0.00000
        DIPS |       722    0.31282    322.285    14.109    0.00000
        DIYD |       722    0.72595    128.529    11.863    0.00000
      DIVPAY |       725    0.27846    339.675    14.240    0.00000
         ROE |       725    0.02631    458.381    14.972    0.00000


. spearman MTBV DIPS DIYD DIVPAY ROE, stats(rho obs p)

+-----------------+
| Key             |
|-----------------|
|   rho           |
|   Number of obs |
```

APPENDIX (A) CONT'D

```
|   Sig. level    |
+-----------------+
             |    MTBV     DIPS     DIYD   DIVPAY      ROE
-------------+-----------------------------------------------
```

```
        MTBV |   1.0000
             |      722
             |
             |
        DIPS |   0.4333   1.0000
             |      722      722
             |   0.0000
             |
        DIYD |   0.1334   0.7901   1.0000
             |      722      722      722
             |   0.0003   0.0000
             |
      DIVPAY |   0.3165   0.7319   0.7220   1.0000
             |      722      722      722      722
             |   0.0000   0.0000   0.0000
             |
         ROE |   0.2809   0.3953   0.2444   0.3729   1.0000
             |      722      722      722      722      722
             |   0.0000   0.0000   0.0000   0.0000
             |
```

. reg MTBV DIPS DIYD DIVPAY ROE

APPENDIX (A) CONT'D

```
  Source |       SS           df       MS      Number of obs   =       722
-------------+----------------------------------   F(4, 717)       =     78.77
       Model |  646096.289         4  161524.072   Prob > F        =    0.0000
    Residual |  1470328.76       717  2050.66773   R-squared       =    0.3053
-------------+----------------------------------   Adj R-squared   =    0.3014
       Total |  2116425.05       721  2935.40229   Root MSE        =    45.284

------------------------------------------------------------------------------
        MTBV |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        DIPS |   .7413825   .5119271     1.45   0.148    -.2636728    1.746438
        DIYD |    .139647    .366586     0.38   0.703    -.5800633    .8593572
      DIVPAY |   .0014835     .01159     0.13   0.898     -.021271    .0242379
         ROE |  -.0113472    .000643   -17.65   0.000    -.0126096   -.0100849
       _cons |  -.3525713   2.048067    -0.17   0.863    -4.373497    3.668354
------------------------------------------------------------------------------
```

. regcheck

+---+

| Regression assumptions: | Test: | We seek values |

|---|

| 1) heterokedasticity problem | Breusch-Pagan hettest | > 0.05 |

| | Chi2(1): 18.843 | |

APPENDIX (A) CONT'D

| | p-value: 0.000 | |

|---|

| 2) no multicollinearity problem | Variance inflation factor | < 5.00 |

| | DIVPAY : 1.08 | |

| | DIYD : 1.08 | |

| | DIPS : 1.02 | |

| | ROE : 1.00 | |

|---|

| 3) residuals are not normally distributed | Shapiro-Wilk W normality test | > 0.01 |

| | z: 14.885 | |

| | p-value: 0.000 | |

|---|

| 4) no specification problem | Linktest | > 0.05 |

| | t: -3.157 | |

| | p-value: 0.002 | |

|---|

| 5) functional form problem | Test for appropriate functional form | > 0.05 |

| | F(3,714):9.891 | |

| | p-value: 0.000 | |

|---|

| 6) influential observations | Cook's distance | < 1.00 |

| | to see the influential obs, type: | |

| | .predict var, cook | |

APPENDIX (A) CONT'D

| | .list var if var > 1 & var !=.

+---+

. vif

Variable | VIF 1/VIF

-------------+----------------------

```
      DIVPAY |      1.08    0.929609
        DIYD |      1.08    0.930153
        DIPS |      1.02    0.976339
         ROE |      1.00    0.999233
-------------+----------------------
    Mean VIF |      1.04

. egen croid = group (companies)
 . . xtset croid year
       panel variable:  croid (strongly balanced)
        time variable:  year, 2010 to 2018
                delta:  1 unit

. . xtreg MTBV DIPS DIYD DIVPAY ROE, fe
```

APPENDIX (A) CONT'D

```
Fixed-effects (within) regression               Number of obs      =       722
Group variable: croid                           Number of groups   =        81
     R-sq:                                      Obs per group:
     within  = 0.2285                                         min =         8
     between = 0.9622                                         avg =       8.9
     overall = 0.3037                                         max =         9

                                                F(4,637)           =     47.18
corr(u_i, Xb)  = 0.3191                         Prob > F           =    0.0000
------------------------------------------------------------------------------
        MTBV |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        DIPS |   .1884813     .98203     0.19   0.848    -1.739926       2.116889
        DIYD |  -.0439015   .4698641    -0.09   0.926    -.9665714   .8787684
      DIVPAY |  -.0012829   .0121383    -0.11   0.916   -.0251187    .022553
         ROE |  -.0092406   .0006728   -13.74   0.000    -.0105617   -.0079195
       _cons |   .5862341   2.273176     0.26   0.797    -3.877591    5.050059
-------------+----------------------------------------------------------------
     sigma_u |  17.574541
     sigma_e |  44.723192
         rho |  .13376384   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(80, 637) = 1.23                     Prob > F = 0.0984
```

. xtreg MTBV DIPS DIYD DIVPAY ROE, re

APPENDIX (A) CONT'D

```
Random-effects GLS regression                   Number of obs     =       722
Group variable: croid                           Number of groups  =        81

R-sq:                                           Obs per group:
     within  = 0.2280                                         min =         8
     between = 0.9492                                         avg =       8.9
     overall = 0.3053                                         max =         9

                                                Wald chi2(4)      =    315.07
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =    0.0000

------------------------------------------------------------------------------
       MTBV |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
------------+-----------------------------------------------------------------
       DIPS |   .7413825   .5119271     1.45   0.148    -.2619762    1.744741
       DIYD |    .139647    .366586     0.38   0.703    -.5788484    .8581423
     DIVPAY |   .0014835     .01159     0.13   0.898    -.0212326    .0241995
        ROE |  -.0113472    .000643   -17.65   0.000    -.0126075    -.010087
      _cons |  -.3525713   2.048067    -0.17   0.863    -4.366709    3.661567
------------+-----------------------------------------------------------------
    sigma_u |          0
    sigma_e |  44.723192
        rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

APPENDIX (A) CONT'D

```
        MTBV[croid,t] = Xb + u[croid] + e[croid,t]

        Estimated results:
                     |       Var     sd = sqrt(Var)
             ---------+-----------------------------
                MTBV |   2935.402       54.17935
                   e |   2000.164       44.72319
                   u |          0              0

        Test:   Var(u) = 0
```

chibar2(01) = 0.00

Prob > chibar2 = 1.0000

. rreg MTBV DIPS DIYD DIVPAY ROE

Huber iteration 1: maximum difference in weights = .99840136

Huber iteration 2: maximum difference in weights = .79505472

Huber iteration 3: maximum difference in weights = .2025853

Huber iteration 4: maximum difference in weights = .23903908

Huber iteration 5: maximum difference in weights = .50068101

Huber iteration 6: maximum difference in weights = .03328946

Biweight iteration 7: maximum difference in weights = .29382769

Biweight iteration 8: maximum difference in weights = .0787768

Biweight iteration 9: maximum difference in weights = .04954169

Biweight iteration 10: maximum difference in weights = .03827057

Biweight iteration 11: maximum difference in weights = .03539762

Biweight iteration 12: maximum difference in weights = .03029256

APPENDIX (A) CONT'D

Biweight iteration 13: maximum difference in weights = .02871752

Biweight iteration 14: maximum difference in weights = .02709332

Biweight iteration 15: maximum difference in weights = .02815278

Biweight iteration 16: maximum difference in weights = .02537138

Biweight iteration 17: maximum difference in weights = .01989814

Biweight iteration 18: maximum difference in weights = .0239179

Biweight iteration 19: maximum difference in weights = .02175007

Biweight iteration 20: maximum difference in weights = .02062606

Biweight iteration 21: maximum difference in weights = .01968086

Biweight iteration 22: maximum difference in weights = .01879883

Biweight iteration 23: maximum difference in weights = .01795338

Biweight iteration 24: maximum difference in weights = .01713567

Biweight iteration 25: maximum difference in weights = .0163412

Biweight iteration 26: maximum difference in weights = .01556683

Biweight iteration 27: maximum difference in weights = .01428504

Biweight iteration 28: maximum difference in weights = .01482724

Biweight iteration 29: maximum difference in weights = .01409086

Biweight iteration 30: maximum difference in weights = .01419301

Biweight iteration 31: maximum difference in weights = .01422136

Biweight iteration 32: maximum difference in weights = .0142299

Biweight iteration 33: maximum difference in weights = .01502928

Biweight iteration 34: maximum difference in weights = .0177151

Biweight iteration 35: maximum difference in weights = .01762134

Biweight iteration 36: maximum difference in weights = .01925965

Biweight iteration 37: maximum difference in weights = .01843622

Biweight iteration 38: maximum difference in weights = .01801223

Biweight iteration 39: maximum difference in weights = .01797035

Biweight iteration 40: maximum difference in weights = .01667068

APPENDIX (A) CONT'D

Biweight iteration 41: maximum difference in weights = .01520832

Biweight iteration 42: maximum difference in weights = .01075381

Biweight iteration 43: maximum difference in weights = .00663702

Robust regression Number of obs = 721

F(4, 716) = 1019.07

Prob > F = 0.0000

MTBV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
DIPS	.7692219	.0124106	61.98	0.000	.7448564	.7935873
DIYD	-.0500436	.0088876	-5.63	0.000	-.0674925	-.0325947
DIVPAY	-.0000944	.0002809	-0.34	0.737	-.0006459	.0004572
ROE	-.0015337	.0001024	-14.97	0.000	-.0017348	-.0013326
_cons	1.098294	.0496793	22.11	0.000	1.000759	1.195828