Risk and Dividend Policy of Quoted Manufacturing Firms: A Panel Study from Nigeria

[1] Daniel I. Nwonodi, [2] John C. Imegi and [3] Marshal Iwedi
Department of Banking & Finance, Faculty of Management Sciences
Rivers State University, Port Harcourt

Abstract

This study examined the effect of risk on dividend policy of quoted manufacturing firms in Nigeria. Panel data was sourced from financial statement of the manufacturing firms' from2009-2018. Dividend policy was proxy for dependent variable while risk was proxied by exchange rate risk, equity price risk, interest rate risk, operational risk, leverage risk, liquidity risk. Fixed effects, random effects and pooled estimates were tested while the Hausman test was used to determine the best fit. Panel unit roots and panel cointegration analysis were conducted on the study. Result from model I indicated that interest rate risk, exchange rate risk and equity price risk have positive effect, while consumer price risk have negative effect on the dividend policy while model 2 found that liquidity risk have positive effect while cash flow risk, leverage risk and operational risk have negative effect on the dividend policy. From the findings, the study concludes that risk have significant effect on dividend policy of quoted manufacturing firms in Nigeria. We recommend that internal and external factors such as corporate size, liquidity, capital structure that affect systemic and unsystematic risk of quoted manufacturing firms should be taken into consideration in formulating financial policies. Managers should ensure that risk within the operating environment be integrated in dividend policy of quoted manufacturing firms and that corporate financial policies such as leverage, liquidity and cash flow that affect and investment, financing policy and dividend policy should be considered in management planning.

Keywords: *Risk, Dividend Policy, Systemic Risk, Unsystemic Risk, Leverage Risk, Liquidity Risk*

Introduction

Corporate value creation provides operations framework that management can use to optimize the effect of management policies on shareholders wealth. The agency theory formulated by Jensen and Meckling (1973) laid more emphases on the relationship between management and shareholders, where managers are agents and shareholders the principals. However, Modigliani and Miller's (1959) argument on the effect of capital on shareholder's wealth has remained one of the challenging features of corporate management decision, such as financing. In a deregulated financial market and a monopolistically competitive environment, the financial management function is a critical success factor that determines the growth, profitability and survival of firms. These functions include formulating implementable financial policies, the financing decision and dividend policy.Dividend policy determines the proportion of earnings to be distributed to shareholders and proportion to retain.

Dividend policy means the payout policy that managers follow in deciding the size and pattern of cash distribution to shareholders overtime (Baker et al, 2011; Lee, 2009).The term, policy, rejects the possibility of randomness and arbitrariness in determining its pattern and size and implies some consistency and predictability (Allen and Michealy, 2003). It is important to understand how the firm's profits are divided between dividend payment and retained earnings. Corporate managers in their daily routine of life are exposed to a number of crucial decisions regarding finance of a company. Consideration of risk in corporate financial policies helps the management optimize operational decision. It is important to consider risk in capital budgeting because incorrect decision might be made if risk is not considered. However it is challenging to fully encompass the two components of risk into the overall corporate decision making that relates to corporate financial policies, especially in the emerging financial market and the developing economies like Nigeria. Conventional decision theory considers investment choice to be a tradeoff between risk and expected return (March and Shapira, 1987).

The main premise in finance is the connection between risk and return. Higher risk is assumed to be compensated with higher return on stocks with rational pricing of stocks. Highly profitable firms are riskier than the average firms (Fama and French, 2015). However, it is also possible that high risk leads to financial distress which can

result in lower future profitability. Conceptually, risk is the probability of loss or failure. In finance the concept of risk relate to variability of earnings. Risk is inherent in every business, but organizations that have the right risk management strategies for business planning and performance management are more likely to achieve their strategies and operational objectives.

Literature Review

Theoretical Review- The Irrelevance of Dividend Policy

Miller and Modigliani (1961) proposed irrelevance theory suggesting that the wealth of the shareholders is not affected by dividend policy. It is argued in their theory that the value of the firm is subjected to the firm's earning, which comes from company's investment policy. The literature proposed that dividend does not affect the shareholders' value in the world without taxes and market imperfections. They argued that dividend and capital gain is two main ways that can contribute profits of firm to shareholders. When a firm chooses to distribute its profits as dividends to its shareholders, then the stock price will be reduced automatically by the amount of a dividend per share on the ex-dividend date. So, they proposed that in a perfect market, dividend policy does not affect the shareholder's return. There are a couple of researchers supporting the irrelevance dividend hypothesis which will be reviewed as follows:

Brennan (1970) supported the irrelevancy theory of Miller and Modigliani and concluded that any rejection of this theory must be based on the denying of the principle of symmetric market rationality and the assumption of independence of irrelevant information. He suggested that for rejection of latter assumption, one of these following conditions must exist: firstly, Investors do not behave rationally. Secondly, stock price must be subordinate of past events and expected future prospect. Hakansson (2006) supported the irrelevance theory of Miller and Modigliani and claimed that dividends, whether informative or not, is irrelevant to firm's value when investors have homogeneous belief and time additive utility and market is fully efficient.

Relevance of Dividend Policy

Relevance of dividend policy based on uncertainty of future dividends Gordon (1962) suggested a valuation models relating the market value of the stock with dividend policy. Gordon studied dividend policy and market price of the shares and proposed that the dividend policy of firms affects the market value of stocks even in the perfect capital market. He stated that investors may prefer present dividend instead of future capital gains because the future situation is uncertain even if in perfect capital market. Indeed, he explained that many investors may prefer dividend in hand in order to avoid risk related to future capital gain. He also proposed that there is a direct relationship between dividend policy and market value of share even if the internal rate of return and the required rate of return will be the same.

In Gordon (1962) constant growth model, the share price of firm is subordinate of discounted flow of future dividends. (Diamond, 2005) selected 255 US based firms as a sample and studied the association of firm's value with dividends and retained earnings reported that there is only weak evidence that investors prefer dividends to future capital gain. His findings also showed a negative association between growth of company and preference of dividend.

Dividend Policy Based on Information Content

Miller & Modigliani (1961) suggested that in imperfect market, dividend may affect the share price. So dividend announcements can be interpreted as a signal of future profitability of firm. (Asquith & Mullins Jr. 1983) used a sample of 168 companies paying dividend for the first time or paying dividend after at least 10-year interruption and studied the relationship between market reaction and dividend announcement. They analyzed the daily abnormal stock returns for the ten-day period prior and ten-day period following the dividend announcement. Their findings implied an approximate abnormal return of +3.7 percent for a period of two days after announcement. Furthermore, they used cross-sectional regression and reported that first dividends' amount has significant positive impact on the excess returns on the day of dividend announcement. They concluded that the magnitude of changes in dividends can be also important. Travlos*et al* (2001) studied the stock price response to announcement of stock dividend and dividend increase in the Cyprus Stock Exchange over 1985 to 1995. They considered announcements of cash dividend and 39

events of dividend increase. Their result provided strong evidence for supporting the signaling hypothesis. They reported prominent excess returns for both cash dividend announcement and cash dividend increase.

Agency Cost of Debt and Dividend Policy

Most researches on agency problem have always viewed it from the shareholders versus management perspective. Agency relationship transcends this narrow scope; it also includes shareholders versus debt holders' conflict viz-a-viz dividend payout policy. Shareholders being the sole claimants of dividends prefer to have large dividends payment. On the contrary, creditors prefer to restrict dividends payment to maximize the firm's resources that are available to repay their claims. Given that this area of interest has not been adequately explored in this area of interest, its inclusion may be considered novel (Jensen and Ruback, 1983).

Agency cost of debt refers to an increase in cost of debt when the interest of shareholders and management diverge, for this reason, debt suppliers 'like bondholders impose certain restrictions on companies (via bond indentures) because of a fear of agency-cost problems. The suppliers of debt financing are aware of two things: (a) Management is in control of their money (b) There are high chances of principal-agent problems in any company. In order to mitigate any losses due to managerial hybris, the debt supplier place some constrains on the use of their money. In general, the agency cost of debt happens when management engages in projects or behavior that benefits shareholders more than bondholders. Taking on riskier projects could benefits shareholders more while taking more risk means higher chances that debt bondholder will default. It should be noted that although each added unit of debt increases the value of the firm by the value of its associated interest tax shield, however, the presence of agency cost modifies this. As the size of debt increases, the value of the levered firm initially increases due to the marginal benefits of interest tax shield. As the debt-to-value ratio further increases, the marginal agency costs rise and the value of the firm begins to fall consequently affecting dividend payout policy ((Jensen and Ruback, 1983). An attempt will be made in this paper to measure agency cost of debt by using the ratio of debt financing to equity financing.

Relevance of Dividend Policy Based on Agency Cost

Zorn at el (2003) studied the determinants of cross-sectional differences in insider ownership, debt and dividend policy by using three-stage least squares. They considered 565 companies as sample for the year 1982 and used 632 companies as sample for the year 1987. They reported that high insider ownership companies adopt lower dividend payment and proposed that insider ownership and dividend payment have negative association. Their findings supported agency cost theory. By studying a sample of 477 US firms, Hexter, (2005) stated those insider ownership and dividend payouts have negative association thorough 1980 to 2005. They also concluded that the number of shareholders and dividend payout are positively related. Their findings were consistent with agency cost hypothesis. (Chen, 2009) used 75 Zelanian companies as sample and studied the factors influencing dividend policy through 1991 to 1999. They concluded that insider ownership has negative impact on dividend payout. Their findings were consistent with agency cost hypothesis.

Relevance of Dividend Policy Based on Clientele Effects

Pettit (2004) investigated on what extent transaction costs and taxes can affect the investor's portfolios in USA. His findings provided empirical proof supporting the clientele effect theory. He studied 914 investors' portfolios and reported that investors' ages and their portfolios' dividend yield are positively related. He also reported that investors' incomes and dividend yield are negatively related. Pettit proposed that aged investors with low-income are more dependent to their portfolios for financing their current consumption. Therefore, they prefer investing in stock with high-payout for avoiding the transaction costs of selling stock. He also demonstrated that investors who have portfolios with low undiversifiable risk prefer high-dividend stocks. His findings also supported the tax-induced clientele effect.

Schlarbaum (2006) used a sample derived from identical database applied by (Pettit, 2004) and evaluated clientele effect hypothesis. But their findings provide very weak proof for supporting the dividend clientele effect theory. In another similar research, (Scholz, 1992) used self- reported data from 400 individuals in the survey of consumer finance (SCF) and developed an empirical model for testing the dividend clientele effect through analyzing the information of investors' portfolios. His

findings showed that the difference between tax rate for capital gains and tax rate for dividends has effect on traders' preference for having high-payout stock in their portfolio or low-payout stock.

Concepts of Risk

Risk is the potential that a chosen action or activity (including the choice of inaction) will lead to a loss. The notion implies that a choice has an influence on the outcome. Potential losses themselves may also be called risks. There are numerous kinds of risks to be taken into account when considering capital budgeting including:

i. Corporate risk
ii. International risk (including currency risk)
iii. Industry-specific risk
iv. market risk
v. Stand-alone risk
vi. Project-specific risk

Each of these risks addresses an area in which some sort of volatility could forcibly alter the plan of firm managers. Market risk involves the risk of losses in position due to movement in market positions (Ahmed, 2013). There are different ways to measure and prepare to deal with risks as well. One such way is to conduct a sensitivity analysis. Sensitivity analysis is the study of how the uncertainty in the output of a model can be apportioned to different sources of uncertainty in the model input. A related practice is uncertainty analysis which focuses rather on quantifying uncertainty in model output. Uncertainty and sensitivity analysis should be run in tandem. Another method is scenario analysis, which involves the process of analyzing possible future events by considering alternative possible outcomes (Ahmed, 2013).

Risk is linked with possible hazards and dangers, while in finance it is a technical matter of unpredictability in expected outcomes, both negative and positive. In other businesses and political settings, risk is closely associated with the spirit of enterprise and value creation (Power, 2007). (Ale, 2009) defined risk as the objectified uncertainty regarding the occurrence of an undesired event, risk is inherent in any walk of life and can be associated with every human decision-making action of which the consequences are uncertain. Over the last decades, risk analysis and corporate risk management activities have become very important elements for both financial as well as non-financial corporations. Firms are exposed to different sources of risk, which can be divided into operational risks and financial risks. Given that the total risk of a company is a product of operating leverage and financial leverage, Mandelker and Rhee (1984) tested whether companies try to balance these two risks, or whether an increase in one part, leads to an increase in the other part as well. The latter could be expected to happen if financial leverage is increased due to the financing of fixed assets (operating leverage). The study found that companies with high operating leverage usually have lower financial leverage, and vice versa. This means that companies indeed balance their total risk level by choosing the amount of financial leverage on the basis of their cost structure.

Dimension of Risks - Systematic Risk

The risk inherent to the entire market or an entire market segment, systematic risk, also known as undiversifiable risk volatility or market risk, affects the overall market, not just a particular stock or industry. This type of risk is both unpredictable and impossible to completely avoid (Pandey, 2005). It cannot be mitigated through diversification, only through hedging or by using the right asset allocation strategy. Pandey (1993) stated that systematic risk is the relevant risk measure for assets a risk arises from the uncertainty about economic fluctuation, earthquake and changes in world energy situation. This risk affects all securities and consequently cannot be diversified away by an investor.

According to Van Horne (1989) while stating the principles of systematic risk that expected return on a risky asset depends only on that asset and systematic number of assets to a greater or lesser extent. The normalized systematic risk is of the individual risky assets. Berger and Udell (1993) were of the opinion that the relevant measure of risk for a risky asset is its systematic risk covariance of returns with the market portfolio of a risky asset. For when the covariance (systematic risk) which is normalized beta coefficient is derived it relates the stocks' variance to market total variance.

Unsystematic Risk

Company or industry-specific hazard that is inherent in each investment, unsystematic risk, also known as nonsystematic risk, specific risk, diversifiable risk or residual risk, can be reduced through diversification. By owning stocks in different companies and in different industries, as well as by owning other types of securities such as treasuries and municipal securities, investors will be less affected by an event or decision that has a strong impact on one company, industry or investment type. Examples of unsystematic risk include a new competitor, a regulatory change, a management change and a product recall (Brookfield, 2005).

The risk that airline industry employees will go on strike, and airline stock prices will suffer as a result, is considered to be unsystematic risk. This risk primarily affects the airline industry, airline companies and the companies with whom the airlines do business. It does not affect the entire market system, so it is an unsystematic or nonsystematic risk. An investor who owned nothing but airline stocks would face a high level of unsystematic risk. However, even a portfolio of well-diversified assets cannot escape all risk. It will still be exposed to systematic risk, which is the uncertainty that faces the market as a whole (Zeller and Stanko, 2009). Even staying out of the market completely will not take an investor's risk down to zero, because he or she would still face risks such as losing money from inflation and not having enough assets to retire. Investors may be aware of some potential sources of unsystematic risk, but it is impossible to be aware of all of them or to know whether or when they might occur. An investor in health-care stocks may be aware that a major shift in government regulations could affect the profitability of the companies they are invested in, but they cannot know when new regulations will go into effect, how the regulations might change over time or how companies will respond (Pike, 1996).

Concept of Dividend Policy

Dividend Policy refers to a company's policy which determines the amount of dividend payments and the amount of retained earnings for reinvesting in new projects. This policy is related to dividing the firm's earnings between payments to shareholders and reinvestment in new opportunities. Dividend policy involves the determination of the payout policy that management follows in determining the size and pattern of cash distributions to shareholders over time (Lease *et al* 2000)

In corporate finance, one of the most important decisions is concerned with the answer of this question that should the profits of firm be distributed to the shareholders as dividend or it must be reinvested in new opportunities and if it must be distributed, what proportion of profit must be paid to shareholder and what proportion must be returned to the business?. For answering this question, managers must consider which dividend policy will lead to maximization of shareholder's wealth and they should not only concentrate on this question that how much of firm's income are required for investment. Instead, they also must consider the impact of their decision on stock's price. Dividend policy is also related to capital structure indirectly and different dividend policies may require different capital structures. Since both capital structure and dividend policy can have impact on the wealth of shareholders and dividend policy can affect capital structure too, it makes decision about dividendpolicy more complex and sensitive.

Measures of Dividend Policy

Dividend Payout Policy

The dividend payout policy is one of the most debated topics within corporate finance and many academics have been trying to find the missing pieces in the dividend puzzle for more than a half century (Baker, 2009). However, some of the most successful companies during the last years such as Apple and Google have chosen not to pay dividends (Ciaccia, 2012). This indicates that it is possible to be successful without paying dividends, so why do firms pay dividends at all? Since the publication of the original Modigliani and Miller (1961) irrelevance propositions, this question has puzzled financial economists. Traditionally, finance scholars emphasize explanations for dividends that are based on the desire to communicate information to shareholders or to satisfy the demand for payouts from heterogeneous dividend clienteles (Allen and Michaely, 2003).According to Forte (2007) although there is a polyphony of literature on the subject, researchers have merely contributed to the multiple paradoxes of corporate dividend policy, thereby adding more pieces to an enlarged puzzle rather than finding the final matching piece that would provide a more precise and complete understanding of the determinants of dividend policy.

Policy of Retained Earnings

Retained earnings are the earnings ploughed back into the company for the purpose of expansion programme. The price at which equity shares are traded in the stock market is their market value. Generally the earnings and their distribution have positive reflection on the share prices. Every year a company retains a part of its earnings (Nunkoo and Boateng, 2009). The level of earnings before interest and tax, the rate of tax payable and the volume of dividend distributed influence the amount of retained earnings. This amount of retained earnings gets accumulated to form a significant source of internal finance. The amount of earnings retained represents a source of fund, which is relatively cheaper. Whenever there is requirement for fund, the company can safely bank upon the retained earnings.

The amount retained by the company acts as a cushion that absorbs the adverse effects of the business. It also enables a company to maintain a stable dividend policy. Profit refers to the earnings of a company. The amount of earnings a company can generate depends not only on its efficient use of funds but also on factors like market for the product manufactured, state of competition, its quality, company's after sales service, government regulations, etc. The earning capacity of a company is an indicator of its continuity of existence (Nunkoo and Boateng, 2009). Higher the level of earnings, higher would be the value that the market attaches to the company. Sufficient amount of earnings enable a company to tide over adverse business conditions (Drobetz, Gruninger, 2007). A company that earns more can maintain a dividend policy that can satisfy the shareholders. Further, by capitalizing the earnings, expansion programme may also be taken up.

Empirical Review

Allayannis and Weston (2018) explained the use of foreign exchange derivatives and the potential effects of these instruments on firm value, in the case of 720 large non-financial firms in the US between 1990 and 1995. A positive relationship was found between the use of foreign exchange derivatives and firm value by selecting Tobin's Q, as a firms' value indicator.

Carter et al. (2016) investigated whether hedging for firms in the US airline industry was a value source in the 1992-2003 periods or not. It was found that protecting risk related to the jet fuel is positively associated with the airline firm value. Jin andJorion (2016) examined the effect of hedging activities of 119 US firms engaged in oil and gas production between 1998 and 2001. According to outcomes, hedging did not affect the market value of the firm in this industry. It can, also, be noted that hedging activities decreases sensitivity of the market price of firms to oil and gas price.

Perez-Gonzalez and Yun (2013) investigated the impact of effective risk management policies on firm value by employing energy companies' data. At first glance, it can be seen that the use of derivatives increased both the firm value and the leverage ratio. Panaretou (2014) found that although the effects of the use of foreign exchange derivatives are statistically and economically significant, the interest rate derivatives had a weak effect and the commodity derivatives has no effect for non-financial firms in the UK.

Li et al. (2014) established the concept of risk management based on the creation of a risk management unit, the use of financial derivatives, or the utilization of services of international accounting firms as an audit firm by taking into account 189 financial firms in China during the period of 2009-2013. It is determined that the use of financial derivative products affected the firm value.

Aytürk et al. (2016) investigated the effects of the use of financial derivatives on firm value non-financial firms in Turkey from 2007 to 2013. In panel data analysis, , it was seen that the use of derivative products, in general, has no effect on firm's value in Turkish Market by employing Fama-French three factor time series technique and sector analysis research method. Akpınar andFettahoğlu (2016) investigated the effects of using derivative products on firm value through tests conducted on 72 non-financial firms in 2009-2013 periods. it is that there is not any positive significant effect was figured out for the companies that use derivatives to eliminate risk factors. The last group research focuses on assessing the FRM determinants.

Zeller and Stanko (2019) demonstrated how to build risk into capital investment decisions. They illustrate how to combine distribution theory, technology, and a business professional's skills and insight into a capital investment analysis. In addition, we show how management can approximate the risk of each cash flow estimate and display the overall capital investment results. This framework is extended by showing how a mutually exclusive decision can be improved, using a lease versus purchase example. An Excel template is readily available from the authors allowing a hands-on application of the framework presented in this paper. In addition, this paper positions the reader to comfortably use more advanced analytics, such as Monte Carlo simulation, a tool that is readily available in commercial software applications.

Dooskar (2013) offered model for the behavior of stock price liquidity and volatility. In this model, investors predict the recent price changes for variations of an asset with risk. When changes in that asset are great, its risk expenditure is high and current efficiency of that asset goes down, efficiency rate of risk-free asset also is low and market encounters illiquidity.

Literature Gap

The impact of risk on corporate performance has well been documented in literature. Existing literature focused more on the effect of the variables on firms' profitability and value of quoted firms, measuring the relationship between risk and variables and corporate profitability. This study focused on the existing relationship between risk and dividend policy of quoted manufacturing firms in Nigeria**.** The literature examined in this study did not investigate direction of causality between risk, and corporate dividend policy of quoted manufacturing firms. Studies that attempted to do so failed to establish the exact causal relationship between the variables (Daunfeldtand Hartwig, 2012; Hermes, Smid& Yao, 2017).This study enhanced the analysis by establishing the causal relationship that exists between risk and corporate dividend policy of quoted manufacturing firms in Nigeria.

Methodology

This study used quasi-experimental research design approach for the data analysis. This combines theoretical consideration (a prior criterion) with the empirical observation and extract maximum information from the available data. The target population is the 63 quoted manufacturing firms on the floor of Nigeria Stock exchange. In order to guide against data omission, and ensure uniformity in presentation, a sample size of twenty (20) quoted manufacturing firms, with complete data was selected for the period of ten (10) years, between2009-2018 (The Nigerian Stock Exchange Report, 2018). The data for this study are secondary data sourced from the financial statement and annual reports of the selected quoted firms.

Model Specification

From theories, principles and empirical findings, the models below are specified in this study.

Systematic Risk

DP= f (EXR, EQR, INTR, CPR) (1)

It is empirically stated as

$$DP = \phi_0 + \phi_1 EXR + \phi_2 EQR + \phi_3 INTR + \phi_4 CPR + \mu \quad (2)$$

Unsystematic Risk

DP = f (OPR, CFR, LR, LIQR) (3)

It is empirically stated as

$$DP = \sigma_0 + \beta_1 OPR + \sigma_2 CFR + \sigma_3 LR + \sigma_4 LIQR + \mu \quad (4)$$

Where

DP = Dividend policy

EXR = Exchange Rate Risk

EQR = Equity Price Risk

INTR = Interest rate risk

CPR = Commodity Price Risk

OPR = Operational risk

CFR = Cash flow Risk

LR = Leverage Risk

LIQR = Liquidity Risk

β_0 = Regression Intercept

β_1 - $\beta 4$ = Coefficient of the independent variables to the Dependent variable

μ = Error term

Table 1: Analysis of Variables and A-Priori Expectation

Variable	Measurement	Notation	Expected relationship
Dividend Policy	Log of dividend payout ratio	DP	Dependent variable
Exchange Rate Risk	Log of variation of naira exchange rate per US dollar	EXR	+
Equity Price Risk	Log of variation on stock prices of the quoted firms	EQR	+
Interest Rate Risk	Log of variation of real interest rate	INTR	+
Consumer Price Risk	Log of value of inflation Rate	CPR	+
Operating risk	Log of variation of total revenue	OPR	+

Cash flow risk	Log of variation on net operating cash flow	CFR	+
Leverage risk	Log of variation on debt equity ratio	LR	+
Liquidity risk	Log of variation on current assets to current liability	LIQR	+

Source: Authors Research Desk, 2020

Methods of Data Analysis

The study used panel Ordinary Least Square model. Econometrically, the panel data standard linear model can be written as follows (Verbeek, 2012; Brooks, 2014);

$$Y_{it} = \beta_0 + X_{it}\beta + \varepsilon_{it} \quad (5)$$

Where Y_{it} is the dependent variable for firm —*I* at time-i; fib is the intercept term; X1 is a k dimensional vector of independent variables; ε_{it} is the error term; the error term changes over individuals and time, and encompasses all unobservable factors that affect Y_{it}.

The Fixed Effects Model (FEM) takes into account the existence of each individual effect of the observations in a particular model. Econometrically, the fixed effects model can be expressed as the equation below (Koop, 2008).

$$Y_{it} = ai + X_{it}\beta + \varepsilon_{it} \quad (6)$$

The **Random Effects Model (REM)** just like the fixed effects model suggests different intercept terms for each entity, the random effects model can be written as:

$$Y_{it} = \beta_0 + X_{it}\beta + ai + u_{it} \quad (7)$$

Where, Y_{it} is a k-dimensional vector of independent variables, but unlike the FEM, there are no dummy variables to capture the heterogeneity (variation) in the cross-sectional element;

= $\varepsilon_{it} = ai + u_{it}$, , which implies that the error term consist of two components**.**

Analysis of Results and Discussion of Findings

Table 1: Hausman Test Analysis

	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.	Decision	Remark
Model 1	9.937036	4	0.0000	Accept alternate	Fixed effect model valid
Model 2	`12.586925	4	0.0000	Accept alternate	Fixed effect model valid

Source: Computed from E-view 9.0, 2020

Hausman specification test has been used to determine which one of the alternative panel analysis methods (fixed effects model and random effects model) among the 3 panel regression models should be applied. From the table above, the result of the Hausman test validate the use of fixed effect model for the three models in the study.

Table 2: **Presentation of Panel Unit Root Results at Levels**

Method	**Statistic**	**Prob.****	**Remark**	**Statistic**	**Prob.****

Model 1: DP				**MODEL 8: DP**	
Levin, Lin & Chu t*			Not		
	-3.93639	0.0000	Stationary	-3.93639	0.0000
			Not		
Im, Pesaran and Shin W-stat	0.49682	0.6903	Stationary	-1.69165	0.0454
			Not		
ADF - Fisher Chi-square	35.2038	0.6858	Stationary	61.1284	0.0173
			Not		
PP - Fisher Chi-square	41.8852	0.3890	Stationary	153.556	0.0000
Interest Rate			LR		
Levin, Lin & Chu t*	-2.86168	0.0021	Stationary	-8.02264	0.0000
			Not		
Im, Pesaran and Shin W-stat	-1.13709	0.1278	Stationary	-2.20592	0.0137
			Not		
ADF - Fisher Chi-square	44.1420	0.3008	Stationary	64.9133	0.0076
PP - Fisher Chi-square	114.188	0.0000	Stationary	69.6633	0.0025
Exchange Rate			OPR		
Levin, Lin & Chu t*	-2.66048	0.0039	Stationary	-6.33204	0.0000
			Not		
Im, Pesaran and Shin W-stat	-1.63994	0.0505	Stationary	-2.89041	0.0019
			Not		
ADF - Fisher Chi-square	53.7726	0.0715	Stationary	72.8945	0.0011
			Not		
PP - Fisher Chi-square	48.7197	0.1623	Stationary	98.0803	0.0000
EQR			LIQ		
Levin, Lin & Chu t*			Not		
	0.98170	0.8369	Stationary	-3.93700	0.0000
			Not		
Im, Pesaran and Shin W-stat	1.34095	0.9100	Stationary	-0.78010	0.2177
			Not		
ADF - Fisher Chi-square	23.1466	0.9848	Stationary	53.7139	0.0723
			Not		
PP - Fisher Chi-square	52.4847	0.0893	Stationary	64.3600	0.0086
CPR			CFR		
Levin, Lin & Chu t*	-6.77365	0.0000	Stationary	-3.45883	0.0003
Im, Pesaran and Shin W-stat	-2.05385	0.0200	Stationary	-0.47749	0.3165
			Not		
ADF - Fisher Chi-square	57.4413	0.0364	Stationary	39.3018	0.5015
PP - Fisher Chi-square	46.2999	0.2284	Not	71.2480	0.0017

			Stationary			

Source: Computed from E-view 9.0, 2020

The Im, Pesaran and Shin (IPS), Fisher-ADF and Fisher-PP test are based on this form. To check the stationarity of our data we use the two types of panel unit root tests. As common unit root process we use Levin, Lin and Chu panel unit root test and for individual unit root process we use three type of panel unit root tests, first one is Im, Pesaran and Shin panel unit root test, second is Fisher type test, the ADF-Fisher chi-square test and last one is also a fisher type test, the PP-Fisher Chi square panel unit root test. The result shows that at 5% level of significance we accept nullhypothesis that means the series are not stationary for some parameter while some of the variables are stataionary.

Table 2: **Presentation of Panel Unit Root Results at Difference**

Method	**Statistic**	**Prob.****	**Remark**	**Prob.****	**Remark**	**Remark**
Model 7: DP				**Model 8: DP**		
Levin, Lin & Chu t*	-9.40778	0.0000	Stationary	-9.40778	0.0000	Stationary
Im, Pesaran and Shin W-stat	-4.26602	0.0000	Stationary	-4.26602	0.0000	Stationary
ADF - Fisher Chi-square	94.8538	0.0000	Stationary	94.8538	0.0000	Stationary
PP - Fisher Chi-square	211.909	0.0000	Stationary	211.909	0.0000	Stationary
Interest Rate			LR			MC
Levin, Lin & Chu t*	-10.5262	0.0000	Stationary	-6.37440	0.0000	Stationary
Im, Pesaran and Shin W-stat	-6.00822	0.0000	Stationary	-3.41121	0.0003	Stationary
ADF - Fisher Chi-square	123.190	0.0000	Stationary	83.8292	0.0001	Stationary
PP - Fisher Chi-square	199.298	0.0000	Stationary	125.404	0.0000	Stationary
Exchange Rate			OPR			EXC
Levin, Lin & Chu t*	4.62237	0.0000	Stationary	-10.2267	0.0000	Stationary
Im, Pesaran and Shin W-stat	1.04427	0.8518	Stationary	-4.54725	0.0000	Stationary
ADF - Fisher Chi-square	20.2050	0.9961	Stationary	98.6672	0.0000	Stationary
PP - Fisher Chi-square	66.1183	0.0058	Stationary	186.877	0.0000	Stationary
EQR			LIQ			DIR
Levin, Lin & Chu t*	0.60105	0.7261	Stationary	-10.0823	0.0000	Stationary
Im, Pesaran and Shin W-stat	-1.35784	0.0873	Stationary	-2.09202	0.0182	Stationary
ADF - Fisher Chi-square	57.2881	0.0375	Stationary	69.2790	0.0028	Stationary
PP - Fisher Chi-square	182.453	0.0000	Stationary	120.040	0.0000	Stationary
CPR			CFR			ACD
Levin, Lin & Chu t*	18.2239	0.0000	Stationary	-5.16009	0.0000	Stationary
Im, Pesaran and Shin W-stat	-1.65709	0.0488	Stationary	-2.21177	0.0135	Stationary
ADF - Fisher Chi-square	54.0402	0.0682	Stationary	68.8883	0.0016	Stationary
PP - Fisher Chi-square	75.5255	0.0006	Stationary	202.008	0.0000	Stationary

Source: Computed from E-view 9.0, 2020

In case of dividend policy series in every test except PP-Fisher chi-square at 5% level of significance it reject null hypothesis but PP-Fisher chi-square accept null hypothesis it seems that the series has a unit root. But first difference of the series at 5% level of significance in all case reject null hypothesis. So after taking first

difference the series is stationary. Details of the panel unit root test results of different variables and also after taking first difference of different variables are given in the appendix.

Table 3 Panel Regressions Results on Dividend Policy for Quoted Firms in Nigeria

	PANEL I: Model i			**PANEL II: Model 2**	
VAR	**Fixed**	**Random**	**VAR**	**Fixed**	**Random**
	0.005728	0.007440		0.024279	0.032964
	*0.444984	*0.579260		*0.947451	*1.361722
INTR	**0.6569	**0.5631	LIQR	**0.3447	**0.1749
	0.088258	0.083342		-0.019559	-0.021638
	*2.713533	*2.569640		*-1.059931	*-1.234832
EXR	**0.0073	**0.0109	LR	**0.2906	**0.2184
	0.031490	0.009580		-0.000705	-0.000537
	*1.730556	*0.656908		*-0.367335	*-0.283906
EQR	**0.0853	**0.5120	CFR	**0.7138	**0.7768
	-0.011192	-0.023772		-0.000586	-0.000639
	*-0.274352	*-0.589695		*0.001711	*-0.377993
CPR	**0.7841	**0.5561	OPR	**0.7325	**0.7058
	1.332246	1.385542		1.575289	1.575102
	*16.58746	*17.94830		*115.9514	*81.23214
C	**0.0000	**0.0000	C	**0.0000	**0.0000
R^2	0.615974	0.637299		0.598203	0.033086
Adj R^2	0.565789	0.417552		0.545395	0.013150
F-stat	12.27403	9.888795		11.32797	1.659587
F-Prob	0.000000	0.000921		0.000000	0.161002
D.W	0.846705	0.729456		0.885291	0.786227

Source: Computed from E-view 9.0, 2020

Interpretation of the Result

Table 3 presents the effect of the risk, agency cost and dividend policy of the quoted manufacturing firms over the 10 years periods covered in this study. Panel I presents results of effect of systemic risk on dividend policy as formulated in model VII. Based on the Fixed Effect Regression Model, the adjusted coefficient of determination (Adjusted R^2) indicates that 56.5 percent variation on the dividend policy of the selected manufacturing firms can be traced variation on the systemic risk of the firms; this implies that 43.5 percent variation can be traced to factors not captured in the model. The results of the estimated model proved that the model is statistically significant based on the F-statistics and probability. The Durbin Watson statistics proved the presence of serial autocorrelation among the variables. The regression intercept is positive and significant which implies that holding other variables constant, financing policy of the manufacturing firm will increase by 1.33 units. Furthermore, the results indicates that interest rate risk, exchange rate risk and equity price risk have positive but no significant effect on dividend policy of the manufacturing firms. However, consumer price risk have negative and no significant effect on the financing policy of the manufacturing firms.

Panel II presents results of effect of unsystemic risk on dividend policy as formulated in model VIII. Based on the fixed effect regression model, the adjusted coefficient of determination (Adjusted R^2) indicates that 54.5 percent variation on the dividend policy of the selected manufacturing firms can be traced to variation in unsystemic risk of the firms; this implies that 45.5 percent variation can be traced to factors not captured in the model. The results of the estimated model proved that the model is statistically significant based on the F-statistics and probability. The Durbin Watson statistics proved the presence of serial autocorrelation among the variables. The regression intercept is positive and significant which implies that holding other variables constant, financing policy of the manufacturing firm will increase by 1.57 units. Furthermore, the results indicates that liquidity risk have positive effect on dividend policy of the manufacturing firms while cash flow risk, leverage risk and operational risk have negative effect on the dividend policy of the manufacturing firms within the periods covered in this study.

Table 4:Pedroni Residual Cointegration Test

Series: DVP CPR EQR EXR INTR

	Statistic	Prob.	Weighted Statistic	Prob.
Model 1				
Panel v-Statistic	-11.91218	0.0025	-12.98010	0.0086
Panel rho-Statistic	12.87505	0.0080	13.09718	0.0090
Panel PP-Statistic	-13.03210	0.0012	-16.16437	0.0000
Panel ADF-Statistic	11.35463	0.0028	-11.46793	0.0412
	Statistic	Prob.		
Group rho-Statistic	15.01096	0.0000		
Group PP-Statistic	-16.88168	0.0000		
Group ADF-Statistic	-10.76546	0.2211		
Pedroni Residual Cointegration Test				
Model 2				
Series: DVP CFR LIQR LR OPR				
Panel v-Statistic	-12.74432	0.0070	-12.87970	0.0080
Panel rho-Statistic	14.17714	0.0000	4.014849	0.0000
Panel PP-Statistic	11.10855	0.0056	0.068719	0.5274
Panel ADF-Statistic	13.32794	0.0096	2.580596	0.9951
	Statistic	Prob.		
Group rho-Statistic	5.565289	0.0000		
Group PP-Statistic	-0.373988	0.3542		
Group ADF-Statistic	2.808125	0.9975		
Pedroni Residual Cointegration Test				

Source: Computed from E-view 9.0, 2020

The results of the cointegration test proved that the variables are cointegrated as the probability coefficient of the variables less greater than 0.05, we accept the alternate hypotheses that there is presence of long run relationship between the risk, agency cost and dividend policy of the quoted manufacturing firms over the periods covered in this study.

Table 5: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
Model 1			
CPR does not Granger Cause DVP	160	2.07000	0.1297
DVP does not Granger Cause CPR		0.17011	0.8437
EQR does not Granger Cause DVP	160	8.57583	0.0003
DVP does not Granger Cause EQR		1.30011	0.2755
EXR does not Granger Cause DVP	160	0.63189	0.5329
DVP does not Granger Cause EXR		0.82634	0.4396
INTR does not Granger Cause DVP	160	0.39310	0.6756
DVP does not Granger Cause INTR		0.94905	0.3893
Model 2			
CFR does not Granger Cause DVP	157	0.95750	0.3862
DVP does not Granger Cause CFR		0.65285	0.5220
LIQR does not Granger Cause DVP	160	0.25597	0.7745
DVP does not Granger Cause LIQR		2.46780	0.0881
LR does not Granger Cause DVP	160	0.52813	0.5908
DVP does not Granger Cause LR		0.35425	0.7023
OPR does not Granger Cause DVP	160	0.51990	0.5956
DVP does not Granger Cause OPR		0.30881	0.7348

Source: Computed from E-view 9.0, 2020

The table presents causality test on the effect of risk, agency cost and dividend policy of the quoted manufacturing firms from 2009-2018. From the causality test presented in the above table, there is independent relationship from systemic risk and investment policy of the quoted manufacturing firms in model 1 except uni-directional causality from equity price risk to dividend policy of the quoted manufacturing firms, we accept the null hypothesis that there is no causal relationship between systemic risk and investment policy of the firms. Model 2 found that there is no causal relationship between unsystemic risk dividend policy of the quoted manufacturing firm while other variables have no causal relationship; we accept the null hypotheses.

Discussion of Findings

The estimated regression results found that interest rate risk of the manufacturing firms have positive and significant relationship with dividend policy of the manufacturing firms within the periods covered in this study. The coefficient of variables as shown in table 4.20 indicates that increase on interest rate risk significantly affect the dividend policy of the quoted manufacturing firm. The positive effect of interest rate risk on the dividend policy of the quoted firm is in line with the expectation of the study. Further findings in the model shows that exchange rate risk and equity price risk have positive and significant effect on the dividend policy of the quoted manufacturing firms, the positive of the variables confirm relevant theories such as the interest rate theory.

The empirical findings contradict the findings of Khan (2018), that there is a positive relationship between the exchange rate and the unemployment and negative relationship between the interest rate, inflation rate and the GDP growth rate with the dividend payout ratio. The findings also goes contrary to the findings of Iheduru and Okoro (2019), that Oil price have positive impact on retention rate of the selected manufacturing firms while exchange rate and interest rate have negative impact on the dependent variable. It was also found that money supply have negative effect on dividend payout rate while inflation rate have positive impact on retention rate. However, consumer price risk has negative effect on the dividend policy of the manufacturing firms. The negative effect of the variables confirms the Khan (2018) and

Iheduru and Okoro (2019) on the negative effect of interest rate on the dividend policy of quoted firms. However, the estimated results as presented in table 4.20 panels I indicates that systemic risk explained 56.5 percent variation on dividend policy of the quoted manufacturing firms. The results of the model was however justifies by the F-statistics and probability. The estimated regression model was formulated to examine and test the relationship between unsystemic risk and the dividend policy of the quoted manufacturing firms for the periods covered in this study. The estimated results as presented in table 4.20 panel II indicates that systemic risk explained 54.5 percent variation on dividend policy of the quoted manufacturing firms. The results of the model was however justifies by the F-statistics and probability. The estimated regression results found that cash flow risk and leverage risk have negative and no significant effect on the dividend policy of the selected manufacturing firms across the periods coved in this study. This indicates that increase on the leverage and cash flow risk within the periods of this stud led to significant decrease on the dividend policy of the firms. Theoretically, financial economic theory stated that corporate risk management is appropriate to increase firm value in the presence of capital market imperfections such as bankruptcy costs, a convex tax schedule, or underinvestment problems. According to Carter et al. (2006) risk management can increase shareholder value by harmonizing financing and investment policies. A credible risk management can mitigate underinvestment costs by reducing the volatility of firm value.

The negative effect of the variables like the findings in model two above contradicts risk management theories and the findings of Perez-Gonzalez and Yun (2013) that the use of derivatives increased both the firm value and the leverage ratio. Panaretou (2014) found that the use of foreign exchange derivatives are statistically and economically significant, the interest rate derivatives had a weak effect and the commodity derivatives has no effect for non-financial firms in the UK, the findings of Li et al. (2014) that the use of financial derivative products affected the firm value but contrary to the findings of Aytürk et al. (2016) that the use of derivative products, in general, has no effect on firm's value in Turkish Market by employing Fama-French three factor time series technique and sector analysis research method and the findings of Akpınar and Fettahoğlu (2016) that there is not any positive significant effect was figured out for the companies that use derivatives to eliminate risk factors.

The estimated results furthermore, justify that operational and liquidity has positive and no significant effect on the dividend policy of the quoted manufacturing firms. The positive effect of liquidity and operational risk on the on the financing policy of the firms conduct the expectation of this study. Like the findings in model two above, the positive effect of the variables can be traced to effective risk management strategies formulated by the firms. the negative effect of the variables confirm the findings of findings of Aytürk et al. (2016) that the use of derivative products, in general, has no effect on firm's value in Turkish Market by employing Fama-French three factor time series technique and sector analysis research method and the findings of Akpınar and Fettahoğlu (2016) that there is not any positive significant effect was figured out for the companies that use derivatives to eliminate risk factors but contrary to the findings of The positive effect of the variables confirm risk management theories and the findings of Perez-Gonzalez and Yun (2013) that the use of derivatives increased both the firm value and the leverage ratio. Panaretou (2014) found that the use of foreign exchange derivatives are statistically and economically significant, the interest rate derivatives had a weak effect and the commodity derivatives has no effect for non-financial firms in the UK, the findings of Li et al. (2014) that the use of financial derivative products affected the firm value

Conclusion and Recommendations

Conclusion

The study examined the effect of systemic risk on the dividend policy of quoted manufacturing firms. The model produced adjusted R^2 of0.565789 which implies that 56.5 percent variation on the dividend policy of the selected manufacturing firms can be traced to variation on the systemic risk of the firms. The results indicates that interest rate risk, exchange rate risk and equity price risk have positive but no significant effect on dividend policy of the manufacturing firms while consumer price risk have negative and no significant effect on the financing policy of the manufacturing firms

The study examined the effect of unsystemic risk on the dividend policy of quoted manufacturing firms. The model produced adjusted R^2 of 0.545395which implies that 54.5 percent variation on the dividend policy of the selected manufacturing firms can be traced to variation on the unsystemic risk of the firms. The results indicates that liquidity risk have positive effect on dividend policy of the manufacturing firms while cash flow risk, leverage risk and operational risk have negative effect on the

dividend policy of the manufacturing firms within the periods covered in this study. The panel unit root produced results that the variables were stationary at first difference while the causality test proved no causality among the variables.The study concludes that there is significant relationship between systemic risk and dividend policy of the manufacturing firms within the periods covered in this study and that there is significant relationship between unsystemic risk and dividend policy of the quoted manufacturing firms.

Recommendations

1. Considering the importance of systemic and unsystemic risk in financial decisions, managers should ensure that risk within the operating environment be integrated in financial policies of quoted manufacturing firms.
2. Corporate financial policies such as leverage, liquidity and cash flow that affect and investment, financing policy and dividend policy should be considered in management planning.
3. The relationship established between agency cost and financial policy of the manufacturing firms, implies that management compensation improvement must be matched with distribution to shareholders. Pursuing financial policy that is not in consonance with risk and agency cost may likely trigger poor management policy. This can be expressed in different ways such as corporate loss, poor financial performance and bankruptcy risk.

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