DETERMINANTS OF PRICE-EARNINGS RATIO: NIGERIAN EXPERIENCE (QUANTILE REGRESSION)

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ABSTRACT

The study examines the determinants of price-earnings ratio using 47 non-financial firms listed in the Nigerian Stock Exchange over the period 2012 to 2016. The essence of the study is to suggests alternative way of valuing stock by investors. Using quantile regression and pooled regression models, the study finds that the independent variables explained more of the systematic variation in P/E ratio at the 25th percentile. Dividend pay-out ratio, share price and dividend per share were statistically significant to explain P/E ratio at the 25th, 50th and 75th percentiles. At the 25th percentile, dividend per share has significantly negative impacts on P/E ratio while dividend pay-out ratio, profitability, market return, average share price and total dividend paid has positively significant impacts on P/E ratio. at the 50th percentile, dividend pay-out ratio, profitability, average share price and firm size has significantly positive impacts on P/E ratio while earnings per share and dividend per share has significantly negative influence on P/E ratio. at the 75th percentile, earnings growth rate has significantly negative impacts on P/E ratio while dividend pay-out ratio and average share price has positively significant effects onP/E ratio.

Keywords:. Price-earnings ratio, non-financial firms, Nigerian Stock Exchange, Quantile Regression model

JEL Classification: C31

INTRODUCTION

To determine firm's value and risk in the absence of underlying theory of what determine firm's value, the financial theory and economic logic remain the guideline. One of such logic is price-earnings ratio which is a valuation technique used for assessing stock value at various levels. The price-earnings (P/E) ratio providesa rough appraisal ofvalue per unit of current firm's earnings to investors' (Hillier, Ross, Westerfield, Jaffe & Jordan, 2010), that is, which stock is cheaper or expensive: cheaper stocks are the more valuable ones. P/E ratioalso helpsinvestors make prediction into what firms' future performances may look like (Afza and Tahir, 2012).Though, changes in demand and supply of shares remain a key factor that determine stock prices, the P/E ratio remain a strong assessment tools investors hinges their choice on,whether to buy or sell

shares depending on its foreseen future value. Firms having higher P/E ratio are considered to have significant prospects for growth (Hillier, *et al*, 2010).

Recently, Nigeria was confirmed to be in recession, the Nigerian Stock Market also revealed some features of recession that includes; decline in market capitalisation, fall in stock price as well as the economy experiencing fall in investment spending. Given that stock price has fallen, existing shareholders will not be interested to sell, avoiding making losses, except they have arbitrage opportunity in another market: a prudent investor will sell only if expected return from investing the proceeds in financial assets of comparable risk is greater. On the other hand, a fall in share price creates opportunity for new entrants, but given the situation of a recession, investors may not be confidence to buy; for the fear that it may fall further.

The solid line in figure 1 indicate 2-quarter moving average trend of market capitalisation while the dotted line is the trend of quarterly market capitalisation for the same period (q1 2013 to q2 2017). The 2-quarterly moving average trend of market capitalisation moved downward during the period q113-q115; q315-q116; and 1316-q117 (average of 2 quarters). These periods are recession periods if market capitalisation value is used to predict recession. The general trend was downward slope over the period q314 to q117.

Appendix 1: Figure 1: Quarterly Market Capitalisation Values (N' Billion) from Q1 2013 to Q2 2017
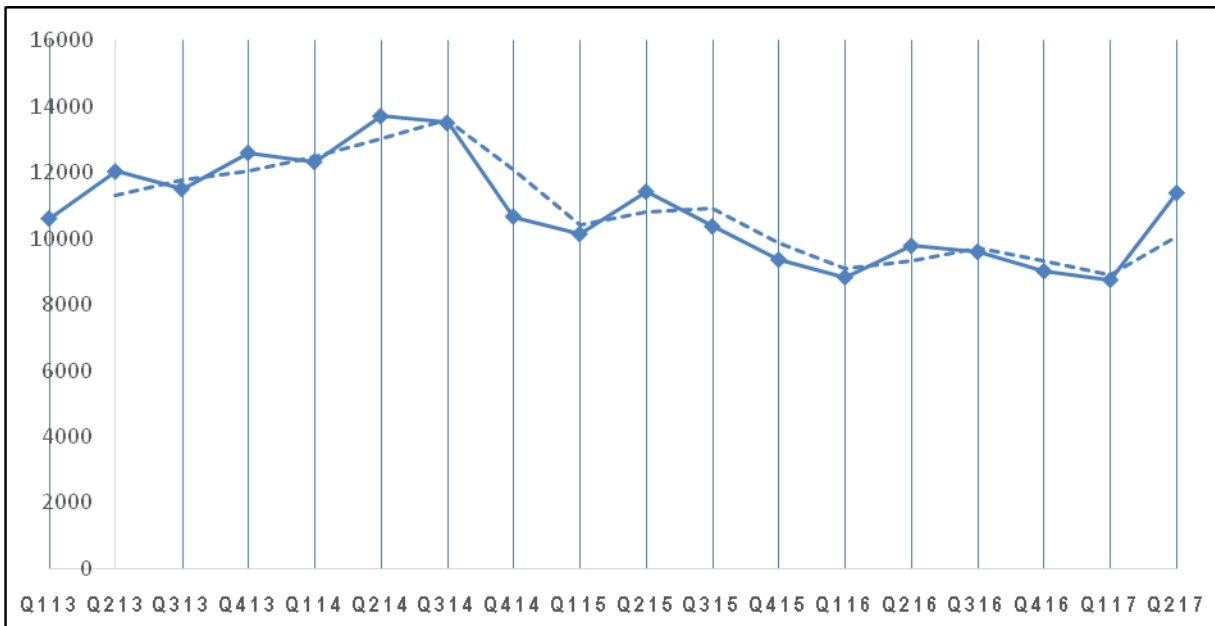
Source: Researcher using data from Central Bank of Nigeria Statistical Bulletin

Perhaps, it is interesting to note that existing and prospective investors can be confidence to buy or sell shares if they know the bearings and magnitude of the determinants of P/E ratio. The numerator (share price) and the denominator (earnings) of the P/E ratio are themselves, influence by accounting inherent factors and fundamental factors. Premkanth (2013, p. 44) remarked that 'comparison of price-earnings ratio over time are meaningless unless changes in the underlying fundamental determinants of P/E ratio are taken into account.'

Thus, an understanding of the relationship between P/E ratio and its determinants, will act as a timing indicator to predict when to buy or sell stock (Ward and Stathoulis, 1993/94).Though, several literatures have analysed empirically, the variation of the P/E ratio and its determinants, given that changing business environment and the difference in business environment between the developed and the developing countries, a regular research in this field of study becomes necessary. Empirical studies have provide supporting and conflicting results on the bearing of the impacts of P/Eratio determinants, and its variation over the years. Breen (1968) suggest analysing P/E ratio to the whole market as it is superior to analysing the P/E ratio of industry groups. This study examines the determinants of P/E ratio of non-financial firms' stocks listed on the Nigerian Stock Exchange (NSE): excluding financial firms and conglomerate firms. Since P/E ratio of firms varied to one another, a regular review is necessary since the P/E ratio drivers are also not static because of diverse growth prospects. At the end of this study, knowledge of the relationship of P/E ratio determinants will have been added to literature which will enable investors to have knowledge of when to buy or sell their stocks.

The remainder of this paper is as follows. Section 2 discusses P/E ratio concepts and the relationship between P/E ratio and its determinants. In addition, the section discusses some of the variables that form the core of the study's analysis. Section 3 is the review of theoretical and empirical results from which the study's hypotheses will be drawn. Section 4 discusses the sources of data, variable measurement and the study's model specification. Section 5 states the method of data analysis. Section 6 is results presentation and analysis, and Summary, conclusion and recommendations is section 7.

CONCEPTUAL RELATIONSHIP AND DETERMINANTS OF PRICE-EARNINGS (P/E) RATIO

P/E ratio is a market value based measure of share price for publicly traded companies of the earnings of a company. P/E ratio is investors' estimates about stock value and for choice of investment decision (Ramcharran, 2002).P/E ratio is how much value per share the market places on a unit of accounting currency earnings of a firm.

Following Ward and Stathoulis (1993/94) the historical P/E ratio $(\frac{P_0}{E_0})$ is related to the prospective (forward or anticipated earnings) P/E ratio$[\frac{P_0}{E_1}]$ by earning growth rate (g_e). Thus prospective P/E ratio$[\frac{P_0}{E_1}]$ $= \frac{P_0}{E_0 (1+g_e)}$ - (1).

Where: P_0 = current market/share price and E_0 is the reported attributable earnings over 12 months, $\frac{P_0}{E_0}$ = historical (reported) P/E ratio, and g_e = earnings growth rate. Holding the other variables constant in equation (1), the following relations should hold: P/E and Po will be directly related, while P/E is inversely related with E_0 and g_e.

The dividend valuation model for a firm whose dividends are expected to grow at a constant rate of g_d is: $P_0 = \frac{d_1}{K_e - g_d}$ -   -   -   -   -   -   -   -   -

-        (2a)

From equation (2a), stock intrinsic value, $K_e = \frac{d_1}{P_0} + g_d$ -   -   -   -   -

     (2b)

Where $\frac{d_1}{p_0}$ = expected dividend yield and g_d = capital gain reflected by expected dividend growth rate if firm retain some or all its earnings or where increase in assets or expansion is met from internal financing: this is internal growth rate), and K_e = minimum required rate of return or stock's intrinsic value. If other variables are held constant in equation (2a), p_0 is directly related to g_d and d_1 but is inversely related to K_e. Following from equation (1) it is expected that P/E is directly related to g_d, d_1 and inversely related to K_e.

If equation (2a) is transformed by dividing both side of the equation by E_0, we have:

$$\frac{p_0}{E_0} = \frac{\frac{d_1}{E_0}}{K_e - g_d}$$ -   -   -   -   -   -   -   -   -   (2c).

Where: $\frac{p_0}{E_0}$ is P/E ratio, $\frac{d_1}{E_0}$ is dividend pay-out ratio. If other variables are held constant, P/E ratio is directly related to dividend pay-out ratio, d_1 and g_d, and inversely related to K_e in equation (2c).

Furthermore, the constant dividend growth rate (g_d) is the product of return on equity and retention ratio[1] thus; g_d= ROE.(b) -   -   -   -   -   -   -   -   -   (3).

Where: ROE = return on equity, and b = retention ratio.It implies dividend pay-out ratio (1-b) must also be constant. Substituting equation (3) into equation (2a), gives:

$$P_0 = \frac{1-b}{Ke - ROE(b)}$$ -   -   -   -   -   -   -   -   (4).

Holding the other variables constant in equation (4), $P_o$is inversely related to'b'while P_o is directly related to 'ROE'. Again, following from equation (2a), P/E will be inversely related to retention rate (b), P/E is directly related to ROE, but P/E will be directly related to d_1.

Additionally, the Du Point Identity relates ROE and return on asset (ROA) as follows:

ROE = is the product of ROA and Equity Multiplier; that is $\frac{net\ income}{total\ equity}$ (Hillier et al, 2010). Thus,

ROA   Equity Multiplier
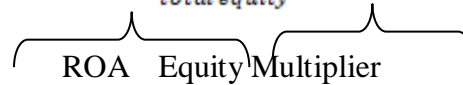
$$ROE = \frac{net\ income}{total\ equity} \times \frac{assets}{assets} = \frac{net\ income}{assets} \times \frac{assets}{total\ equity} = \frac{net\ income}{sales} \times \frac{sales}{assets} \times \frac{assets}{total\ equity}$$-   - (5).

Substituting equation 5 into equation 4 produce:

$$P_0 = \frac{1-b}{Ke - \frac{net\ income}{sales} \times \frac{sales}{assets} \times \frac{assets}{total\ equity}(b)}$$ -   -   -   -   -   -   (6).

Equation (5) and (6) suggests that growth is a function of net income, total equity, assets, sales, equity multiplier ratio, retention rate and ROA ratio. That is, an increase or decrease in any of these variables or ratios will affect growth rate.Given that P/E and Po are directly related from equation (1), movement in the variables and ratios in equation (5) and (6) will affect P/E ratio.

Where there is no growth in dividend or firm not retaining earnings (EPS = DPS)[2];Po $= \frac{d_1}{K_e} = \frac{EPS_1}{K_e}$

-    -   (7).

And with growth in dividend, following from equation (2a), $P_o = \frac{EPS_1(1-b)}{K_e - br}$ -   -   -

(8).

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[1] If g_d is constant, it follows b will also be constant.
[2] Earnings per share equal dividend per share.

Where: br = expected dividend growth rate (g_d) and EPS_1= expected earnings per share. Holding other variables constant in equation (8) and following from equation (2a) where P/E is directly related to Po, P/E ratio will be directly related to EPS_1. For equations (2), (4) and (6) to hold, $Ke > g_d$.

Similarly, equation (5) can be substituted into equation (8) to produce: $P_o = \dfrac{EPS_1(1-b)}{K_e - \frac{net\,income}{sales} \, x \, \frac{sales}{assets} \, x \, \frac{assets}{total\,equity}}$

- (9).

The general model for Po (Current share price) for stream of dividend with growth rate (g_d) is:

$$P_o = \sum_{t=1}^{n} \frac{d_t(1+g_d)^t}{(1+K_e)^t}$$
- - - - - - - - - (10).

Where in time t; d_t = constant dividend per share; K_e = cost of equity (Minimum required rate of return.), for period t = 1, 2…, n, and g_d = dividend growth rate.The equations above except equation (10) assumed constant normal growth which is anyway, unreal.

From equation (10), P_o = f(t, K_e, d_t, g_d).t ispartly a function of time value of information from the past years filtering into the model that have not been quantified and time value of money.

Following equations(2a),(2b), (4), (6) and (10), firms should earn a return on retained funds equal to Ke to ensure growth of dividends and share price. If return earned on retained earnings is less than Ke, the market price of the firm's share will fall (Pandey, 2015).

REVIEW OF THEORETICAL AND EMPIRICAL STUDIES

The P/E ratio has been used to evaluate investment quality— stocks having relatively low P/E ratio is assumed to have better investment performance standing over that with high P/E ratio in terms of valuable investment opportunity (Sezgin, 2010; Basu, 1977). According to Anderson and Brooks (2006) low P/E ratio is associated with mature, stable and moderate growth potential sectors while high P/E ratios can be found in relatively young and fast growing sectors.Average P/E ratios of group of firms tend to maintain their rank over time within their industry classes (Mantripragada, 1979).Mantripragada (1979) observed that individual stocks have significant stability in their P/E ratio rank, more strongly so over shorter periods of time in an examination of 429 stocks listed on the New York Stock Exchange over the period 1960-1976. P/E ratio can vary either positively or negatively, depending on the market risk condition.

If the above information is correct, P/E ratio can be used to predict how well stock market and the stocks is progressing. For instance, in a situation where highP/E ratio starts to fall, investors

may sell their stock to avoid losses and buy shares whose P/E ratio is rising. However, P/E ratio is used with caution because, firms with little or no earnings would probably depict higher P/Eratio. If firms are not in the same line of business or their performance is not affected by similar business factors, P/E ratio may not be appropriate for comparison. Also, P/E ratio cannot be applied for loss making firms. Literature identified several factors that influenceP/E ratios and they include: dividend pay-out ratio, earnings growth, dividend growth, market price, return on equity, dividend, and earnings per share and so forth. The determinants are discussed below.

Dividend growth rate

Dividend growth is fundamental to equity valuation [the Gordon growth model (equation 2a & 2b)]. Theoretically, dividend growth rate and P/E ratio are expected to rise together (see equation 2a). The Gordon growth model suggests P/E ratio is positively related to growth. Investors' assume dividend growth determines the extent to which equity income will keep pace with inflation rate. To preserve purchasing power, dividend growth should be higher than fall in purchasing power through inflation.Reilly, Griggs & Wang (1983) showed direct relation between P/E ratio and dividend growth in a study of quarterly Standard & Poor 500 data for the period 1963 to 1980. The study hypothesis as follows:

H1a: The effects of dividend growth rate are positive for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

H1b: The magnitude of positive effects of dividend growth rate is larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms'P/E ratio distribution for non-financial firms listed in the NSE.

Dividend pay-out ratio

Dividend pay-out policy is deciding on how a corporate profit should be distributed: either pay it whole as dividend or retain whole or part of it for expansion. Dividend policy remain controversial in area of finance and 3 schools have evolved on the impact of dividend policy on firm: firstly, that firm's value will increase with increasing dividend pay-out (bird-in-hand hypothesis); secondly, that firm value will reduce with increase in dividend pay-out ratio, and thirdly, that dividend pay-out ratio make no difference (Miller and Modigliani, 1961) in a world without tax, no transaction costs or other uncertainties in a perfect capital market. Dividend pay-out policy is a function of various factors; it is inversely related to firm's need such as financing firm's growth opportunities. Firms that expect higher growth rate may need a low dividend pay-out policy, thus avoiding external financing costs. Notwithstanding, Arnotta&Asness (2003) and Ping &Ruland (2006) showed positive bearing between dividend pay-out and growth. According to Khan, Naeem, Rizwan& Salman (2016), P/E ratio has no impact on dividend pay-out ratio.

According to Wenjing (2008), the return and stock value expected by investors will rise when high dividend pay-out are made and consequently, it leads to a high P/E ratio. Given that investors will prefer higher return increase in stock value (see: Wenjing, 2008) and Arnotta&Asness (2003) that showed positive association between dividend pay-out ratio and P/E ratio, the study hypothesis that:

H2a: The impacts of dividend pay-out ratio are positive for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

2b: The magnitude of positive effects of dividend pay-out ratio is larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms' P/E ratio distribution for non-financial firms listed in the NSE.

Earnings growth

This is the size of growth in a firm's net income over a specific period, often one year or the percentage gain over time. It's a driving force behind stock's appreciation. Earnings growth is percentage change in the year's earnings per share relative to the previous year's earnings. Bakshi& Chan (2000) examined over 15,000 stocks taken from 42 countries and shows that expected earnings growth is a critical determinant of P/E ratio in cross-section of individual stocks. In examination of what determines P/E ratio, Beaver & Morse (1978) observed earnings growth explain little of the persistence differences in P/E ratio. The study further shows that P/E ratio correlate negatively with earnings growth in the year portfolio was formed, but positively in the year following. Ramcharran (2002) found that growth (earnings potential) is a determinant of cross-country variation of the P/E ratio in emerging markets. In a study of the links between P/E ratio and expected earnings growth rate of over 15,000 stocks from 42 countries, Bakshi& Chan (2000) established that expected earnings growth rate is a significant determinant of P/E ratio in the cross-section of individual stocks. Reilly *et al* (1983) realised earnings growth result in increase in P/E ratio. Loughli (1996) show positive relationship between P/E ratio and expected earnings growth rate. White (2000) reported that P/E ratio exerts positively on expected earnings growth rate in an examination of US Stock Market (proxy with Standard & Poor's 500 Stock Index). A positive influence of earnings growth on P/E suggests high earnings growth will offset the risk effect, and leads to an increase in investors' confidence and thus, the price-earnings ratio (Afza& Tahir, 2012).Bakshi& Chan (2000) also show that a higher anticipated earnings growth rate significantly bid the stock's price-earnings upward in a cross-section examination.Following the theoretical argument that earnings growth and price-earnings ratio are negatively related (equation 1) and the study that observed P/E ratio correlate negatively with earnings growth in the year portfolio was formed (Beaver & Morse, 1978), this study hypothesis that:

H3a: The influence of earnings growth is negative for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

H3b: The magnitude of negative effects of earnings growth rate is larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms' P/E ratio distribution for non-financial firms listed in the NSE.

Share price/market price:

This is the amount investors are ready to pay or sell a unit of share in the stock market. It is the current price at which an asset or service can be bought or sold. Malhotra, Chandiwala&Tandon (2013) observed that P/E ratio has positive and significant bearing with stock price in an examination of NSE 100 companies in sample of 95 companies over the period 2007-2012. Beaver & Morse (1978) reported that market risk is insufficient to explain movement in P/E ratios over the period longer than 2 years. Kumar & Warne (2009) shows that variability in market price is a significant determinant of P/E ratio of Indian Capital Market firm data. This suggests that investors' may prefer these firms' share whose market price move in the same direction.Afza& Tahir (2012) recorded P/E ratio is positively and significantly related to variability in market price. Arslan& Zaman (2014) in an examination of non-financial listed firms' data in Pakistan reported that P/E ratio has significantly positive influence on stock price. Following Malhotra *et al* (2013), Afza& Tahir (2012); Arslan& Zaman (2014) the study hypothesises that:

H4a: The impact of share price is positive for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

H4b: The magnitude of positive impacts of share price is larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms' P/E ratio distribution for non-financial firms listed in the NSE.

Earnings per share (EPS)

 EPS is one of the investment tools used for evaluating firm's performance either in the short or long term, and is also one of the measures of managerial efficiency. The estimated earnings can be used to measure the financial health and prospect of a company. Beaver & Morse (1978) defined EPS as that constant cash flow whose present value is equivalent to the present value of cash flows generated from current equity investment. The International Accounting Standards Board (IASB) in its International Financial Reporting Standard (IFRS) 14 defines EPS as: the company's net after-tax earnings that belong to equity shareholders divided by the number of

outstanding shares. Theoretically, EPS impact directly on P/E ratio: ahighEPS will reflect a high P/E ratio and vice-versa (see equation 8). This study hypothesis that:

H5a: The influence of EPSis negative for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

H5b: The magnitude of negative effects of EPS are larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms' P/E ratio distribution for non-financial firms listed in the NSE.

Market return

Given the Markowitz portfolio theory, it is the gain or loss on the overall theoretical market portfolio, and that include all assets. A positive market returns to P/E suggests firms with high market returns raise investor's confidence to select those firms in their portfolio (Afza& Tahir, 2012). White (2000) in multiple regression model showed that market return has positive and significant impact on P/E multiple. Similarly, Abbasi&Pagghe (2013) show P/E ratio is a significant determinant for the stock returns in Tehran Stock Exchange. Following the result by Afza& Tahir (2012) and Abbasi&Pagghe (2013) that found direct relation between market return and P/E ratio, we hypothesis that:

H6a: The influences of market return are positive for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

H6b: The magnitude of positive influence of earnings growth rate is larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms' P/E ratio distribution for non-financial firms listed in the NSE.

Profitability

Firm performance (profitability) concept is evaluating the outcome of how effective and efficiently, management have employed the firm's resources (Neely, Gregory &Platts, 1995; Emudainohwo, 2016). Thus firm's success is judged by its performance over period of times, just as firms with good performance or profitability are those that will attract investors (Emudainohwo, 2016). Profitability is one indicator for evaluating firm performance. Amongst profitability indicators are: return on equity, return on asset, asset turnover and so forth. In an examination of the association between the forward P/E ratio and profitability, Wu (2014) observed U-shape relationship between forward P/E ratio and return on equity. Besides, the study shows that firms having high P/E ratio tend to have lower ROE in the following years. The study by Premkanth (2013) on sample of 30 companies listed on the Colombo Stock Exchange

over the period 2007-2011 show that ROE impact negatively on P/E multiple, but not sufficient to explain P/E multiple. Sezgin (2010) observed unidirectional Granger's running from return on equity to P/E ratio. Truong (2009) finds that consistent superior return is achieved from investing in low P/E stocks. Following Wu (2014) and Premkanth (2013) that observed inverse relationship between firms with low P/E ratio and better investment performance, this study hypothesised that:

H7a: The impacts of profitability are negative for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

H7b: The magnitude of negative impactsis larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms' P/E ratio distribution for non-financial firms listed in the NSE.

Dividend per share (DPS)

Dividend is the apportionment of earnings in real assets among the firm's shareholders in proportion to their ownership. The decision to pay out dividends is based on a firm's dividend policy. DPS is the dividends declared by a company divided by the number of outstanding ordinary shares issued. Companies that are in a better cash position are in a better position to pay dividend except they have some leverage to cheap source of fund. Increase in DPS over time while maintaining a long-term growth rate is expected to relate with higher P/E ratio (Nikbakht&Polat, 1998). Perhaps, due to promising information contents from firms, the relatively more dividend paying firms should be related with relatively higher P/E multiples. However, in an examination of Iran Khodro Company, Mirfakhr, Dehavi, Zarezadeh, Armesh, Manafi&Zraezadehand (2011) find negative and significant relation between DPS and P/E ratio. Theoretically (see equation 2a and 2b), dividend is directly related to P/E ratio. Nevertheless, following the argument by Nikbakht&Polat (1998), we hypothesis that:

H8a: The effects of DPS are positive for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

H8b: The magnitude of positive effects is larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms' P/E ratio distribution for non-financial firms listed in the NSE.

Control variables

Control variables are not primary variable of interest but are related to the target variables. We use 3 control variables to account for their potential effects on P/E ratio for non-financial firms listed in the NSE. The inclusion of control variables is meant to remove their effects from the model. The following control variablesare included in the examination of the data.

Shareholders' equity (proxy with log of number of shares issued and ranking for dividend)

Shareholders' equity is the worth of a firm owners' claim against firm's assets— it is the residual difference between assets and liabilities which means it is not fixed. Value of shareholders' equity will increase when firm retain part of earnings for reinvestment. Retaining part of earnings will result in capital gain. Given that price-earnings ratio is directly related to capital gain (g_d) (see equation 2a and 2b), theoretically, an increase in shareholders' equity through retained earnings should increase P/E ratio. This study expects that shareholders' equity is directly related to P/E ratio and hypothesis that:

H9: Shareholders' equity effects are positive for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

H9b: The magnitude of shareholders' equity positive effects is larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms' P/E ratio distribution for non-financial firms listed in the NSE.

Total dividend

Dividend is the portion of the profit after tax, which is distributed to the shareholders for their investment bearing risk in the company. While Miller & Modigliani (1961) proposed the dividend irrelevancy theorem, Jensen &Meckling (1976) advocated that dividends may matter for investors in agency cost considerations. They argued that dividends enforced managerial discipline and efficiency in an organisation and for this reason, investors may prefer the dividend paying firms. Dividend provides signals that convey information to the outside world about the current and future earnings prospects of the corporation (Miller & Rock, 1985). Dividends are important regarding the explanatory power of stocks prices. Based on these propositions, we expect positive association between dividend paid and P/E ratio and hypothesis that:

H10a: Total dividend paid impacts are positive for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

H10b: The magnitude of the total dividend paid positive effects is larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms' P/E ratio distribution for non-financial firms listed in the NSE.

Firm size (proxy with log of average total assets)

The concept of economy of scale is that bigger firms' marginal cost is lower when compared to the marginal cost of a smaller firm (Niresh&Velnampy, 2014). Larger sized firms are more likely

to be successful than smaller sized firms from the perspective of earnings from scale, advantages to creditor, assets' use as collateral to creditors and for diversification advantages (Emudainohwo&Tarurhor, 2016) and internal trading, superior technology knowhow, bulk purchases, monitoring and research and development capacity that enhance future profits than smaller ones (Bhattacharyya &Saxena, 2009). Firm size has been found to have significant impact on value-relevance of firms' accounting information (Ghayoumi, Nayeri, Ansari &Raeesi, 2011). On the contrary, Kumar (2015) had shown firm size proxy with total assets is inversely related to the value creation of firms. Investors assessment of P/E ratio is a function of firms present and future value and there is a significant relation between stock value and total assets (firm size). Thus, we hypothesis that:

H11a: Firms' size influences are positive for all quantiles in the conditional firm P/E ratio distribution for non-financial firms listed in the NSE.

H11b: The magnitude of the firms' size positive influences is larger for upper quantiles or/and are smaller for lower quantiles in the conditional firms' P/E ratio distribution for non-financial firms listed in the NSE.

METHODOLOGY AND MODEL SPECIFICATION

Sources of data and variables measurement
Companies annual report is the source of data for the study. The data is for the period 2012 to 2016 representing 47non-financial firms listed in the NSE. The study has a panel data set of 235firms' year's observation. The measurement of the variables for the study is contained in table 1.

Table 1: Variable and measurement

	Variables	Measuremment: for firm i and time t
1	Price-earnings (P/E) ratio: Dependent variable	Market value per share divided by earning per share (Kumar, 2015; Afza & Tahir, 2012)
2	*Dividend growth rate	% change in the year's DPS relative to the previous year's DPS (Nikbakht & Polat, 1998). Scaled down by 10.
3	Dividend pay-out ratio (DP)	Ratio of DPS to EPS (Afza & Tahir, 2012; Ward & Stathoulis, 1993/94)

4	*Earnings growth rate	Percentage change in net income (Afza & Tahir, 2012; Nikbakht & Polat, 1998). Scaled down by 100.
5	Profitability (proxy with return on equity)	Income before extraordinary items available for common equity divided by common equity (Wu, 2013)
6	Earnings per share	Profit after tax minus Preferred dividend divided by number of ordinary share outstanding (Kumar, 2015)
7	Dividend per share	Total dividend divided by number of ordinary shares outstanding (Malhotra et al, 2013; Nikbakht & Polat, 1998)
8	Market return	Ratio of dividend plus change in share price to last year share price, of firm i for time period t (Afza & Tahir, 2012; Nikbakht & Polat, 1998)
9	Share price/stock price	Average closing share price.
10	*Total dividend paid	It is the portion of the profit after interest and tax, which is distributed to theshareholders for their investment bearing risk in thecompany (Malhotra et al, 2013). Scaled down by 1,000,000.
11	*Shareholders' equity	Proxy with logarithm of number of ordinary shares issued and ranking for dividend.
12	*Firm size	Proxy with log of average of total assets at the beginning and end of the year

* natural log and values scaled down to reduce heteroscedasticity and support the constant variance assumption of ordinary least square.

Model specification

Following Afza& Tahir (2012) and Nikbakht&Polat (1998), the study model P/E ratio with dividend growth rate, dividend pay-out ratio, earnings growth rate, market price, EPS, market returns, profitability, DPS, shareholders' equity, total dividend paid and average total assets. The model is specified as follows:

$P/E_{it} = bo_{it} + b1DGR_{it} + b2DPOR_{it} + b3EGR_{it} + b4ASP_{it} + b5EPS_{it} + b6MR_{it} + b7PRTt_{it} + b8DPS_{it} + b9SHE_{it} + b10TD_{it} + b11AAE_{it}\varepsilon_{it}.$

Where:

P/E is price-earnings ratio, bo is constant term, DGR is dividend growth rate, DPOR is dividend pay-out ratio, EGR is earnings growth rate, ASP is average share price, EPS is earnings per

share, MR is market return, PRT is profitability (proxy with return on equity), DPS is dividend per share, SHE is shareholders' equity (proxy with log of number of shares issued and ranking for dividend), TD is total dividend paid, AAE is average assets employed, b1 to b11 are the independent variables coefficients, i is specific firm, t is time and ε is the error term.

Method of data analysis

Given a pooled panel time series data, the study adopted first, Hausman3 test for deciding the most appropriate model between fixed-effects and random-effects models. If the test decides random-effects model the most appropriate, the study will further, double check between random-effects and pooled regression models, using Breusch-Pagan test.4 Furthermore, the study will carry out diagnostic checkson the suitability of the time series data such as: Cross-Sectional Dependence test (Baltagi, 2008), using Pesaran CD test,5 and test for heteroscedasticity using Breusch-Pagan/Cook-Weisbera test for heteroscedasticity.6 Where there ischallenge of either cross-sectional dependence or heteroscedasticity, the study will run a Driscoll and Kraay standard errors in the accepted regression model (see: Hoechle, 2007). If there is no cross-sectional dependence or heteroscedasticity challenge, it means the accepted model from the Hausman test and Breusch-Pagan test will be adopted for the study's analysis. However, ifHausman test and Breusch-Pagan test reject using random effects or fixed effects models, but accepts pooled regression, pooled regression will be adopted for the analysis.

The study adopted pooled regression and quantile regression models7 to investigate the relation between P/E ratio and its determinants [dividend growth rate, dividend pay-out ratio, earnings growth rate, average share price, EPS, market return, profitability (proxy with return on equity), DPS, shareholders' equity (proxy with log of number of shares issued band ranking for dividend), total dividend paid and log of average assets employed].

Quantile regression (QR) which model conditional quantiles as a function of predictors was introduced by Koenker& Bassett (1978). QR is an extension of linear regression model (Buchinsky, 1998) and it is particularly useful where there are specific changes in a conditional quantile. Thus, it is can be useful to model a predetermined position of distribution between target and the estimator variables. This is particularly true where the target variable has more than one mode, and OLS will be misleading since it relies on the mean as a measure of centrality for a multimodal distribution. Thus, QR can be used in this study to examine any categories of P/E ratio or tell P/E ratio are impacted at certain distribution along the continuum. QR has some advantages that includes: no strict parametric assumptions as in ordinary least square regression (Koenker, 2005), QR estimates are more robust against outliers in the response measurements

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[3]See hypothesis and acceptance rule in table 3

[4] See hypothesis and acceptance rule in table 4

[5] See table 5

[6] See table 5

[7]Random effect and fixed effect regression models would have been appropriate for the examination of the pooled panel data but the data did not pass their pre and post examination tests.

(Rose, Pranger, Chen, Chatterjee, Wei, Heatwole& Warren (2017), QR overcomes various problems that is frequently challenging to ordinary linear regression such as error terms not constant across a distribution thereby violating the axiom of homoscedasticity (Abdullahi, 2015), it is an effective method for investigating the relationship outside the mean between the response variable and the predictive variables (Cade & Noon, 2003), and it is an effective model for detecting relationship between variables when there is no, or a weak, relationship exists between means (Cade & Noon, 2003).

PRESENTATION AND INTERPRETATION OF RESULTS

Hausman's test, Breusch-Pagan tests anddiagnostic checks

Though, the study employed QR and pooled regression model, it is expedient the processes adopted for the study be expressly stated. The fixed-effects and random-effects model were statistically significant, thus were well fitted (result omitted, see table 2 for their p-value). The Hausman's test result (table 3), p-value (p = 0.9983)was statistically insignificant, it implies random-effects regressionis a preferred most appropriate model over fixed-effects model in this study.Next, using the Breausch-Pagan test, we furthercheck which is most appropriate: random-effects or pooled regression model? The Breusch-Pagan test (table 4) returned a statistically insignificant p-value (P = 0.3118). The Breusch-Pagan resultrejects the random-effects and accepted the pooled regression model. The rejection of both fixed effects and random effects models suggest no need for extending their diagnostic checks. However, the study performed the cross-sectional dependence test to ensure no challenges of heteroscedasticity and no serial correlation in the data.The results of the Pesaran's test of cross-sectional independence (p = 0.2847) and the Breusch-Pagan/Cook-Weisbera test for heteroscedasticity (p = 0.1548), suggests there is no cross-sectional dependence and non-heteroscedastic (tables 5).

Table 2: fixed-effects and random-effects results (P-value)

Model	P	Overall R^2
Fixed effects	0.0266	0.1055
Random effects	0.0025	0.1153

Table 3: Hausman Test

Hypothesis	H_O: RE model is appropriate (they are not correlated) H_A: FE model is appropriate (they are correlated)
Decision rule	If p-value is statistically significant, reject null hypothesis and accept the alternative hypothesis.
Result	p-value = 0.9995 (insignificance)
Decision	Accept H_O: random effects model is appropriate.

Table 4: Breusch-Pagan Lagrange Multiplier test

Hypothesis	H_O: Pooled regression model is appropriate H_A: Random Effects model is appropriate
Decision rule	If p-value is statistically significant, then reject Ho and accept H_A
Result	p-value = 0.3374
Decision	Accept H_O: Pooled regression is most appropriate.

Table 5: Diagnostic tests results

Tests	P	Decision
Pesaran's test of cross-sectional independence.	0.2847	There is no cross-sectional dependence[8].
Breusch-Pagan/Cook-Weisbera test for heteroscedasticity	0.1548	Non-heteroscedastic[9]

Normality test Ramsey RETEST test and Variance Inflator Factor (VIF)

To employ the pooled panel regression, the study examined the normality, and Ramsey RESET tests to test the existence of omitted variable or non-linearity of the variables.Shapiro-Wilk W

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[8]Ho: No serial correlation in the residual across entities

[9]Ho = Constant variance/ no serial correlation.

test for normal data indicates that the variables are normally distributed (table 6). The Ramsey Reset test(table 8) suggests no evidence of functional form misspecification (P = 0.4124).The VIF (table 7) also show the data has no multi-collinearity challenges. Thus, the study ran the pooled regression model with the QR models (table 8).

Table 6: Shapiro-Wilk W test for normal data

Variable	W	V	z	p
Price-earnings ratio	0.39219	104.402	10.782	0.00000
Dividend growth rate	0.63040	63.486	9.628	0.00000
Dividend pay-out ratio	0.29108	121.769	11.139	0.00000
Earnings growth rate	0.35371	111.012	10.924	0.00000
Profitability (return on equity)	0.54341	78.428	10.118	0.00000
EPS	0.58615	71.086	9.890	0.00000
DPS	0.37139	107.974	10.860	0.00000
Market return	0.40928	101.466	10.715	0.00000
Average share price	0.36737	108.666	10.874	0.00000
Total dividend paid	0.42857	98.152	10.638	0.00000
Shareholders' equity (logarithm of number of ordinary shares issued and ranking for dividend).	0.97337	4.574	3.527	0.00021
Firm size (log of average total assets)	0.97077	5.022	3.743	0.00009

Table 7: Variance Inflator Factor (VIF)

Variable	VIF	1/VIF
DPS	4.82	0.207465
Average stock price	4.81	0.207912
Earnings growth rate	4.11	0.243463
Dividend pay-out ratio	4.06	0.246068
EPS	3.55	0.281642
Total dividend paid	2.11	0.473841
Firm size (total average assets)	2.05	0.487451
Shareholders' equity (No. of shares)	1.69	0.592463
Return on equity	1.59	0.627430
Dividend growth rate	1.56	0.643454
Market return	1.07	0.937080
Mean VIF	2.86	

Regression results

We present the estimation results of pooled regression to contrast with the results of quantile regression (using 3 different percentiles distributions: 25th, 50th & 75th) in table 8. The R^2 of the quantile regression are relatively, not significantly different (25th percentile = 22.79 per cent; 50th percentile = 21.47 per cent and 75th percentiles = 20.25 per cent). However, R^2 is highest with the 25th percentiles distribution while the 75th percentiles distribution is the least. Thus, our selected independent variables in the model explained more of the systematic variation in the dependent variable at 25th percentiles and the least in the 75th percentiles.While the signs of the pooled regression and the quantiles regression are the same except for firm size (negative in pooled regression but positive in quantiles regression), none of the predictive variables is

significant to explain P/E ratio with pooled regression. The relatively low value of the R^2 for the results (it is 11.54 per cent in the pooled regression), is an indication of the difficulty in explaining the determinants of price-earnings ratio for non-financial firms listed in the NSE over the examined period. The low R^2 values suggests that more variables are needed to improve the predictive ability of P/E ratio for non-financial firms listed in the NSE.

A critical observation shows that 3 of the explanatory variables (dividend pay-out ratio, share price and DPS) are significant to explain P/E ratio at all examined percentiles.Generally, the strongest and positive determinants of P/E ratio from the results are pay-out ratio followed by share price amongst the non-financial firms listed in the NSE over the examined period. Dividend growth rate and shareholders' equity (proxy with log of number of shares issued and ranking for dividend) are not significant to explain P/E ratio neither in the pooled regression model nor in the QR model.

Dividend growth rate [25th percentile = -0.0195(0.115), 50th percentile = -0.0145(0.187), 75th percentile = -0.0176(0.476) and pooled regression = -0.0270(0.589)] coefficients are both insignificantly negative with P/E ratio in QR and pooled regression models, indicating that dividend growth rate has a negative impact on P/E ratio. The finding did not support the study's hypothesis 1a. Specifically, the magnitude of the estimated negative effects of dividend growth rate did not gradually decreases nor increases from lower percentile to upper percentile of the P/E ratio distribution: which offers no support to hypothesis 1b. The results did not also corroborate Reilly *et al* (1983) that showed direct relation between P/E ratio and dividend growth rate in a study of quarterly Standard and Poor 500 data for the period 1963-1980 and is also not sufficient to explain movements in P/E ratio for non-financial firms listed in the NSE over the period examined. Although, the results are not sufficient to explain movement in P/E ratio, it however tends to suggest that dividend growth rate is inversely related to P/E ratio, but not moving in the same direction as theoretically expressed.

Dividend pay-out ratio [25th percentile = 0.9904(0.000), 50^{th}percentile = 1.0440(0.000), 75th percentile = 1.0358(0.000) and pooled regression = 0.7884(0.081)] coefficients are both positive with P/E ratio in QR and pooled regression models, except that it is significant in the QR model. It indicates that with QR model, dividend pay-out ratio has a positive impact that is sufficient to explain P/E ratio at 1 per cent level of significant in the examined percentiles. The results support hypothesis 2a (except with the pooled regression model) and the magnitude of the estimated positive impacts of dividend pay-out ratio did not gradually decreases or increases from lower percentile to higher percentile of the P/E ratio distribution, instead, it is highest at the 50th percentile (coefficient of 1.0440) which offers no support to hypothesis 2b. For example, the dividend pay-out ratio coefficient is 0.9904, 1.0440 and 1.0358 at 25th, 50th and 90th percentiles, respectively. The results of the QR model further corroborates Arnott &Asness (2003) and Ping

&Ruland (2008) that showed positive bearings between dividend pay-out ratio and P/E ratio. It however, disagrees with Khan *et al* (2016) that showed P/E ratio has no impact on dividend pay-out ratio. The results imply that firms with themedian P/E ratio derive more value from median dividend pay-out ratio than from low or high dividend pay-out ratio. Perhaps, firm's value may be affected with increase or decrease in dividend pay-out ratio from the median position, particularly that theoretically, dividend pay-out ratio is inversely related to firm's need such as financing firms' growth. A high pay-out ratio means that external financing costs and firm's financial risk may increase. Where high dividend pay-out ratio leads to high price-earnings ratio, the return and stock value expected by investors may rise (Wenjing, 2008) since risk and return are directly related. However, the study suggests that level of dividend pay-out ratio and P/E ratio should be within same percentile.

Earnings growth rate [25th percentile = -0.0699(0.097), 50th percentile = -0.0191(0.734), 75th percentile = -0.2917(0.021) and pooled regression = -0.2772(0.279)] coefficients are both negativewith P/E ratio in QR and pooled regression models, indicating that earnings growth rate has a negative influence on P/E ratio. However, earnings growth rate impact is significant with P/E ratio and thus, support the study's hypothesis 3a only at the 75th percentile distribution at 5 per cent significant level. The magnitude of the estimated negative influences of earnings growth rate is highest at the 75th percentile distribution but did not increase or decreases from lower percentile to higher percentile of the P/E ratio distribution, which offers no support to hypothesis 3b. Only the result at the 75th percentile distribution corroborates an earlier study that show growth rate is a significant determinant of P/E ratio (Bakshi& Chan, 2000) but disagrees with the findings that show direct relation between earnings growth and P/E ratio (Reilly *et* al., 1983; Loughli, 1996; White, 2000). The result implies that firms with high (75th percentile distribution) P/E ratio derive more value from low earnings growth rate than firms with high P/E ratio for the same earnings growth rate. The implication of the result at the 75th percentile distribution of P/E ratio is that investors may perceive that there exist little or no unusual earnings opportunities at the lower percentile distributions but only at the 75th percentile distribution. This may however, be due to temporary factors peculiar to the firm, which may cause low earnings growth rate or increasing risk (see: Beaver & Morse, 1978). Furthermore, in terms of valuable investment opportunities, firms with low price-earnings ratio is preferred to the ones with high P/E ratio (Sezgin, 2010; Basu, 1977). This is particularly true because, firms with little earnings would probably depict higher P/E ratio and investors would be more cautious to make investment, except for loss or very low profit making firms. A further caution is that since earnings growth rate is inversely associated with P/E ratio, at low earnings growth, firms may have to raise external funds to expand or make investment, and unless they operate minimum dividend pay-out policy, they may face increasing financial risk and cost of debt. On the other hand, given the inverse association between earnings growth and P/E ratio, a high earnings growth and a low

dividend pay-out ratio within the 75th percentile distribution firm means that the firm might be relatively self-sufficient to sustain expansion. Though, this study recommends low P/E ratio and high earnings growth firm within the 75th percentiles firms for an investors' valuable P/E ratio, however, investors rational for making investment will still play key role in decision to invest: either to pay higher amount for low earnings growth or lower amount to high earnings growth.

Profitability (proxy with return on equity**)** [25th percentile = 0.0456(0.014), 50th percentile = 0.0636(0.011), 75th percentile = 0.0538(0.334) and pooled regression = 0.0350(0.756)] coefficients are both positive with P/E ratio in QR and pooled regression models. It indicates that profitability of firms has a positive bearing on P/E ratio. The results are however, only significant at 5 per cent level of significant and sufficient to explain movement in P/E ratio at the 25th and 50th percentiles distribution and however, did not support the study's hypothesis 7a. The magnitude of the estimated positive impact did not gradually increase or decreases from lower percentile to upper percentile of the P/E ratio distribution, which offers no support for hypothesis 7b. The highest magnitude is found at the 50th percentile distribution (0.0636). The QR result at the 25thand 50thpercentiles, corroborated Wu (2014) and Truong (2009) that showed that superior return is associated with low price-earnings ratio. It however, did not support Premkanth (2013) that show return on equity impact negatively on price-earnings ratio but not sufficient to explain price-earnings ratio. The implications of the results at the 25th and 50th percentiles distribution should be taken with caution. On one hand, it is argued that firms having higher price-earnings ratio are considered to have significant prospects for growth (Hillier *et al*., 2010) and on the other hand, in terms of valuable investment opportunities, it is argued that stocks with relatively low price-earnings ratio is preferred to one with high price-earnings ratio (Sezgin, 2010; Basu, 1977). Furthermore, given that low P/E ratio is associated with mature, stable and moderate growth potential sector, potential investors are in the best position to advise themselves.

Earnings per share [25th percentile = -0.0552(0.771), 50th percentile = -0.8150(0.002), 75th percentile = -0.8885(0.120) and -0.6507(0.573)] coefficients are both negative with P/E ratio in QR and pooled regression models, indicating that EPS of firms has negative bearings on P/E ratio. However, it is only statistically significant, supports hypothesis 5a and is sufficient to explain P/E ratio at the 50th percentile distribution at 1 per cent level of significance. The magnitude of the estimated negative impacts of EPS gradually increases from lower percentile to upper percentile of the P/E ratio distribution, which offers support to hypothesis 5b. It may be implied from the results that firms at the 75th percentile P/E ratio derive more value from the 75th percentile EPS than firms with low or higher P/E ratio for the same EPS. But for sufficiency to explain the result, the result of the P/E ratio 50th percentile distribution firms are better off to attract prospective investors. at the corresponding 50th EPS percentile distribution. Thus, the

study suggests investors invest in firms whose earnings per share and P/E ratio falls within the 50th percentiles for optimal benefits.

Dividend per share (DPS) [25th percentile = -0.7002(0.008), 50th percentile = -1.1910(0.001), 75th percentile = -1.5830(0.046) and pooled regression = -1.4590(0.363)] coefficients are both negative with P/E ratio in QR and pooled regression models, indicating that the DPS of firms has negative effects on P/E ratio. However, only the effects of the QR are significant to explain P/E ratio but they did not support hypothesis 8a. The QR results corroborates Mirfakhr*et al* (2011) that found negative and significant relation between DPS and P/E ratio and generally, contradicted Nikbakht&Polat (1998) argument that increase in dividend should produce higher P/E ratio. The study's result shows that the magnitude of the estimated negative effects of DPS gradually increases from 25th percentile distribution to 75th percentile distribution, which offers support to hypothesis 8b. For example, the DPS coefficient is -0.7002, -1.1910 and -1.5830 at 25t, 50th and 75th percentiles, respectively. As the percentiles increase, the magnitude of DPS coefficient also increases. The implication of the results is that firms with high P/E ratio percentiles distribution derive more value from a lower degree of DPS percentiles distribution than firms with high P/E ratio percentile distribution for the same degree of DPS: the reverse is the case for firms with low P/E ratio taken into consideration, the inverse association between DPS and P/E ratio. The study infers that high P/E ratio firms are better-off given their magnitude for attracting low DPS within the same percentile.

Market return [25th percentile = 1.5397(0.010), 50th percentile = 0.7939(0.316), 75th percentile = 0.9412(0.596) and pooled regression = 0.9076(0.801)] coefficients are both positive with P/E ratio in QR and pooled regression models, signifying that the market return of firms has a positive influence on P/E ratio. However, only the 25th percentile distribution result is significant, supports hypothesis 6a and is sufficient to explain P/E ratio at 1 per cent significant level. The result corroborates earlier studies by White (2000) and Afza& Tahir (2012) that found positive and significant relation between market return and P/E ratio. Specifically, the study observes that the magnitude of the estimated positive impacts of market return did not gradually increases or decreases from lower percentile to upper percentiles, rather, it is highest at the lower (25th) percentile. Thus hypothesis 6b is not supported. The QR at the 25th percentile suggests firms with low P/E ratio derive more value from low market return than firms with high P/E ratio for the same market return. The QR at the 25th percentiles imply that firms with low market return and low P/E ratio should attract more investors for better value.

Average share price [25th percentile = 0.0284(0.002), 50th percentile = 0.9384(0.000), 75th percentile = 0.0775(0.004) and pooled regression = 0.0636(0.243)] coefficients are both positive with P/E ratio in QR and pooled regression models, signifying that the average share price of firms has a positive impact on P/E ratio. Nevertheless, only the QR results are statistically

significant, sufficient to explain P/E ratio and supports the study's hypothesis 4a at 1 % significant level. The magnitude of the estimated positive impacts of average share price is highest at the 50th percentile (0.9384) and neither increases or decreases from lower percentile to upper percentile, which offers no support to hypothesis 4b. The results imply that firms with median (50th percentile) P/E ratio will obtain more value from median (50thpercentile) average share price than firms with low or high P/E ratio for the same average share price.The study infers that median P/E ratio firms are in a better position to capture the benefits of median average share price than low or high P/E ratio. The study suggests investors should embrace first, firms with median share price and median P/E ratio and/or firms whose share price and P/E ratio falls within the same percentile.

Table 8: Regression Results

25th Quantile	50th Quantile		75th Quantile		Pooled Regression	
Std Err.	Coef	Std Err.	Coef	Std Err.	Coef	Std Err.
0.0082	-0.0145	0.0110	-0.0176	0.0246	-0.0270	0.0499
0.0738	1.0440	0.0987	1.0358	0.2217	0.7884	0.4492
0.0419	-0.0191	0.0561	-0.2917	0.1259	-0.2772	0.2552
0.0185	0.0636	0.0247	0.0538	0.0555	0.0350	0.1125
0.0089	0.0706	0.0120	0.0775	0.0268	0.0636	0.0544
0.1895	0.0938	0.2536	-0.8885	0.5695	-0.6507	1.1540
0.2652	-1.1910	0.3520	-1.5830	0.7905	-1.4590	1.6018
0.5901	0.7939	0.7898	0.9412	1.7736	0.9076	3.5935
0.0015	0.0017	0.0020	0.0276	0.0044	0.0043	0.0090
1.3832	-2.1806	1.8511	-6.1191	4.1572	-4.5348	8.4230
1.1137	3.3035	1.4904	2.2887	3.3471	-2.9785	6.7818
11.4344	1.9314	15.3024	44.2454	34.3649	84.0642	69.6286
0.2279	0.2147		0.2025		0.1154 (Adj $R^2 = 0.0718$)	
					0.0031	

Variable	Coef
Dividend growth rate	-0.0195
Dividend pay-out ratio	0.9904
Earnings growth rate	-0.0699
Profitability (Return on equity)	0.0456
Average share price	0.0284
Earnings per share	-0.0552
Dividend per share	-0.7002
Market return	1.5397
Total dividend paid	0.0043
Shareholders' equity (No. of shares ranking	-1.7779
Firm size (Average total assets)	1.6563
_cons	-0.0083
R^2	
Prob > F	

Total dividend paid [25th percentile = 0.0043(0.004), 50th percentile = 0.0017(0.396), 75th percentile = 0.0276(0.533) and pooled regression = 0.0043(0.702)] coefficients are both positive with P/E ratio in QR and pooled regression models, indicating that the total dividend paid by firms has a positive impact on P/E ratio. However, only the 25th percentile result is statistically significant, supports hypothesis 10a and is sufficient to explain movement in P/E ratio. The magnitude of the estimated positive effects of total dividend paid did not increases or decreases from lower percentile to upper percentile of the P/E ratio distribution, which offers no support to hypothesis 10b. The study's result at the 75th percentile suggests that firms with high P/E ratio will have more value from high total dividend paying firms than firms with low P/E ratio for the same total dividend paid. However, only at the 25th percentile, the study infers that low P/E ratio firms are able to enforce management discipline and efficiency in utilising firms' resources and perhaps, the dividend paid is signalling better information to the outside world at the higher percentile distribution. For sufficiency to explain movement in P/E ratio, the study suggests that investors should prefer firms within the low total dividend paid and low P/E ratio percentile distribution.

Shareholders' equity (proxy with number of shares issued and ranking for dividend) [25th percentile = -1.7779(0.200), 50th percentile = -2.1806(0.240), 75th percentile = -6.1191(0.142) and pooled regression = -4.5348(0.591)] coefficients are both statistically insignificantly negative with P/E ratio in QR and pooled regression models, signifying that the shareholders' equity of firms has a positive effect on P/E ratio. The results did not support the study's hypothesis 9a. The magnitude of the estimated negative effects of shareholders' equity gradually

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[10] Note: Values in (), i.e. p and t are the P-values and t-values respectively.
[11] Ho = Model has no omitted variables

increases from lower quantile to upper quantile of the P/E ratio distribution, which is in agreement with hypothesis 9b. For example, the shareholders' equity coefficient is -1.7779, -2.1806 and -6.1191 at 25th, 50th and 75th percentiles, respectively. The coefficient of the quantile increases as the quantiles increases. Nevertheless, the results are not sufficient to explain P/E ratio.

Firm size (proxy with average assets employed) [25th percentile = 1.6563(0.138), 50th percentile = 3.3035(0.028), 75th percentile = 2.2887(0.495) and pooled regression = -2.9785(0.661)] QR coefficients has insignificant positive impact with P/E ratio while the pooled regression coefficient has insignificant negative impact with P/E ratio. The results did not support the study's hypothesis 11a. neither is it sufficient to explain movement in P/E ratio. The magnitude of the estimated positive effects of firm size did not gradually increases or decreases from lower percentile to upper percentile of the P/E ratio distribution, which offers no support for hypothesis 11b. The magnitude of the estimated positive effects of firm size on P/E ratio is greatest at the 50th percentile distribution. It nevertheless suggests firms' value to investors is greatest at the 50th percentile distribution of firm size and P/E ratio distribution.

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary and conclusion

After random-effects and fixed-effects regression failed pre and post estimation tests and checks, the study employed pooled regression and QR models to examine the determinants of P/E ratio in non-financial firms listed in the NSE over the period 2012-2016. The results showed that R2 was highest at the 25th percentile distribution, thus, our selected independent variables in the QR model explained more of the systematic variation in the P/E ratio at 25th percentile and the least is the 75th percentile. The bearings of the P/E ratio determinants are the same except for firm size that has negative sign in the pooled regression while QR have positive signs. Dividend pay-out ratio, share price, and DPS were generally statistically significant to explain P/E ratio movement at the 25th, 50th and 75th percentiles distribution. Across the regression results, pay-out ratio was the strongest determinant of P/E ratio followed by share price amongst the non-financial firms listed in the NSE over the period examined. Dividend growth rate and shareholders' equity were not significant to explain P/E ratio at any of the examined percentiles distribution nor in the pooled regression model.

At the 25th percentile distribution, dividend growth rate, earnings growth rate, EPS, DPS and shareholders' equity have negative impacts on P/E ratio, but only DPS has significantly negative impact on P/E ratio at the 25th percentile distribution. At the 25th percentile distribution, dividend pay-out ratio, profitability, market return, average share price, and total dividend paid has positively significant impacts on P/E ratio while firm size has positive but insignificant

impact on P/E ratio.At the 50th percentile, dividend pay-out ratio, profitability, average share price and firm size has significantly positive impact on P/E ratio while market return and total dividend paid has insignificantly positive influence on P/E ratio. on the other hand, earnings growth rate and shareholders' equity has insignificantly negative influence on P/E ratio while EPS and DPS has significantly negative influence on P/E ratio.

At the 75th percentile, dividend growth rate, EPS and shareholders'' equity has insignificantly negative bearings with P/E ratio while earnings growth rate has a significantly negative bearing with P/E ratio. On the other hand, dividend pay-out ratio and average share price has significantly positive effects on P/E ratios while profitability, market return, total dividend paid and firm size has insignificantly positive effects on P/E ratio. under the pooled regression model, dividend paid-out ratio, profitability, market return, average share price and total dividend paid return positive impacts on P/E ratio while dividend growth rate, earnings growth rate, EPS, DPS, shareholders' equity and firm size has negative impacts on P/E ratio. however, none of the determinants has significant impacts on P/E ratio.

Recommendation

Based on results sufficiency to explain movement in P/E ratio, the study makes the following recommendations which are further dependent on investors rational for investment. Since earnings growth rate is inversely related to P/E ratio, at a lower earnings growth rate, firms will have to raise additional external funds for expansion. And, if they must maintain high dividend pay-out policy, it means they may be facing increasing financial risk or high cost of debt. On the other hand, combining a high earnings growth and a low P/E ratio, firms may be self-sufficient to sustain future expansion. Thus, this study recommends low P/E ratio and a high earnings growth ratio firm for an investors value for P/E consideration. The study also recommends that inconsideration of P/E ratio as a valuation basis, investors should invest where dividend pay-out ratio and P/E ratio are within the same percentile. Furthermore, the study recommends firms having high P/E ratio and low earnings growth rate to that of a low P/E ratio and high earning growth rate. This is because, they are inversely related but with a precaution since low P/E ratio is associated with mature, stable and moderate growth potential sector (Anderson & Brooks, 2006). Investors should invest in firms having low market return and low P/E ratio for better value and still, investors should embrace firms whose share price and P/E ratio are within the same percentile: investing in firm whose share price is inversely related to P/E ratio should be avoided since they may not be worthwhile to an investor. Finally, investors are recommended to invest in firms whose total dividend paid is directly related to P/E ratio for optimal value, lower total dividend and lower P/E ratio combination is recommended.

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