

The Relationship between Dividend Payout and Financial Performance: Evidence from Top40 JSE Firms

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Abstract: The study investigates the relationship between dividend payout ratio and the financial performance of Top40 JSE (Johannesburg Stock Exchange) based on the market capitalization on dividend payment. The several empirical studies have been conducted both developed and developing countries, however to date there is no universal agreement especially in developing countries like South Africa on the relationship between dividend payout and financial performance despite few empirical evidence studies conducted in South Africa. The study therefore analyses the relationship between the two variables dividend payout ratio (DPR) dependent variable and financial performance (independent variable) which is measured by net profit margins (NPM), liquidity (LIQ), leverage (LEV), growth (GRO) and firm size (SIZE). Through panel data Top40 companies on the JSE from 2010-2015 were purposively selected for analysis. The fixed effect model was applied as recommended by Hausman test. In order to eliminate the problem of collinearity, autocorrelation and heterokedasticity the study employed the generalized least squares (GLS). The regression results found negative relationship between dividend payout ratio of Top40 firms with profitability and liquidity, and a positive relationship were found on dividend payout with net profit margins (NPM), leverage (LEV), growth (GRO), and firm size (SIZE).

Key words: Fixed effect model; random effect model; pooled effect model; Top40 FTSE; GLS; Dividend payout ratio; financial performance

JEL Classification: B26

1. Introduction

There are many different reasons why firms or companies should pay or not pay dividends to investors who invested (Amidu and Abor, 2006). Most academic researchers wondered why companies pay dividend and why investors are interested in payments of dividends; The companies may pay dividends as a rewards to their existing shareholders and to persuade potential investors to invest in shares, however investors pay close attention to dividends since through dividends they get on their shares or investments (Karani, 2015, p. 5). Successful firms are able to create income than unsuccessful firms (Chumari, 2014). The current study need to determine the relationship between dividend payout and financial performance of firms operating in South Africa as compared to firms operating in developed countries. The Top40 JSE was chosen based on the fact that it represents more than 80% of market capitalisation of the JSE.

Research Questions

Due to subtle or scant research on which company's factors significantly influence dividend payout decision in emerging markets there is a need to gain understanding of the relationship between dividends payout and firm performance among listed companies in South Africa. The following questions below addressed in the study.

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- What association exist between dividend payout and financial performance of Top40 FTSE/JSE firms in South Africa?
- What impact net profit after tax, revenue growth, net profit margin, liquidity, leverage and firm size on dividend payout ratio of Top40 FTSE/JSE firms in South Africa?

Research Objectives

Despite the empirical studies conducted on the relationship between dividend payout and financial performance there is a huge space to be filled in order to respond to this (Aurangzeb and Dilawer, 2012). The purpose of this study is to investigate the relationship between of dividends pay out and firm performance over a period of six (6) years from 2010-2015, and the factors influencing dividends payout on firm performance in South Africa. The study objectives are twofold.

- To determine the association between dividends payout and financial performance among listed firms in South Africa.
- To determine the impact of return on assets, net profit margins, financial leverage, liquidity, growth and firm size on the dividend payout ratio.

Research Hypothesis

In light of the above-mention research objectives and related questions, the following hypothesis have been formulated:

H₁: Profitability/net profit margin has a positive relationship with dividend payout ratio.

H₂: Financial leverage has a negative relationship with dividend payout ratio.

H₃: Liquidity has a positive relationship with dividend payout ratio.

H₄: Growth opportunities has a positive relationship with dividend payout ratio.

H₅: Firm size has a positive relationship with dividend payout ratio.

The above hypothesis will be evaluated using correlation analysis and regression analysis.

Theoretical Framework

The bird-in-the-hand theory states that dividends represent the shareholders as an increase in wealth drives share prices up, while investors prefer large dividend payouts rather than capital gain Al-Kuwari (2007) argued that dividend payout has more influence on share price and future cash flow. The main reason behind this explanation is that paying large dividends reduces the cost of capital but leads to an increase in firm value. This is supported by Lintner (1956) and Gordon (1962). Some researchers such as Bhattacharya (1979) have argued that risks in the firm influence dividend distribution to investors. An increase in riskiness of cash leads to lower dividend payments. On the other hand, an increase and decrease in dividend payments does not affect the riskiness of the firm. The overall explanation indicates that riskier cash flows tend to pay small dividends (Al-Kuwari, 2007).

The idea of dividend payment is one possible method used to minimise conflicting interests among a firm's stakeholders, which usually involve managers vs shareholders, shareholders vs bondholders (creditors) and even major stakeholders (institutional investor or controlling owner) and all other shareholders as they differ regarding the investment experience. The truth is that shareholders are not being informed about the details of a firm's transactions as a result of the gap that exists between

managers and owners, which arises because of separation of ownership and control and as a result of the information gap known as the agency problem. Being the owners of a firm's resources, managers may use their power to gain the private benefits of control (Afza and Mirza, 2014).

Managers access a firm's financial information more often than investors do. When they announce changes in dividend policy, managers try to convey information to the market and other stakeholders in as positive a way as possible in order to achieve long-term objectives (Firer, Gilbert and Maytham, 2008). Signalling theory suggests that firms with poor future prospects should not take actions that are easily duplicated with poor prospects. Firms make a long-term commitment to future growth in order to pay cash dividends over a short period of time (Firer *et al*, 2008).

The clientele preference theory argues that dividend payments are taxed directly whereas capital gains are not taxed until the share is sold (Al-Kuwari, 2007). For tax reasons, most investors do not prefer high dividend payouts, they prefer large amount of retain earning to avoid tax. The importance of capital gains is that they lead investors to favour lower dividends (Al-Kuwari, 2007). Contrary to the theory, some suggest that firms should pay lower dividends in order to maximise share price. Modigliani and Miller (1961) are in agreement with clientele theory, observing that this theory influences dividend payout in imperfect capital markets, but in perfect markets, it does not influence dividend payout policy.

The Modigliani and Miller model (1959) runs counter to the relevance theory of dividend, which states that an increase in dividend payout leads to an increase in financial performance. In addition, Modigliani and Miller (1961) argue that dividend payout does not affect shareholders' wealth, which means that irrespective of the percentage paid, as dividends to investors, do not influence dividends are not influenced. However, this argument is based on two assumptions, namely a perfect capital market and a rational investor. It is commonly accepted that wealth creation is determined by retained earnings and financing by the particular firm. Therefore, MM theory states that paying large or small dividends does not affect financial performance. Transaction costs arise when a firm uses external funding in the form of debt, which leads to high interest costs. However, some firms prefer to use internal funding based on their capacity to use this type of funding that influences dividend payment.

Al-Kuwari (2007) argues that external funding is more costly than internal funding. The residual theory of dividends is that a firm pays dividends from earnings after financing all net present value projects. The major problem facing a firm's managers is the investment of large portions of dividends when this is not appropriate. The importance of adopting a residual dividend policy is that it saves flotation and other costs associated with issuing debts by generating funds internally (Zameer, Rasool, Igbal and Arshad, 2013). Firm managers believe that high retention increases growth.

2. Methodology

The study uses the panel data, which consist of Top40 listed companies on the Johannesburg Securities Exchange (JSE) ranked based on their higher market capitalization. The companies were selected because they have consistently been appearing on Top 40 on average from the years 2010 to 2015. The choice of the period is significant owing to the fact that it covers the period pre- and post-global economic crisis of 2008. This decision takes into account the fact that although most of countries were affected by this crisis, in particular in the United States and the other parts of Europe, South Africa was moderately affected. Thus, it will be interesting to determine the trend of dividend

payout decision during that era. The hypothesis testing includes both random effect, fixed effect and pooled effect which recommended by the Hausman test. The random effect model was applied as recommended by Hausman test. In order to eliminate the problem of collinearity, autocorrelation and heterokedasticity using the generalized least squares (GLS).

3. Literature Review

In a situation where a firm pays low dividend due to low cash availability, the management will consider external sources of financing could be either lending or share issue it is importance to balance firm's needs (Manneh and Naser, 2015). The retained earning plays an important role for future expansion, which would lead to higher dividend payout. The dividend payout decision starts with profitability, if the firm experience high profitability lead to high dividend payment to shareholders. In order to pay cash dividend to shareholders or issue further shares depend on the level of the firm's unappropriated profit or excess cash and such distribution can be in cash or by issue of additional shares (Azeez and Latifat, 2015). It is important to consider investment opportunities when making such decision that would increase future earnings and if such opportunities are not available, the management should distribute the earnings to shareholders (Abdul and Haruto, 2012). The dividend payment does not only

The larger the proportion of dividend paid, the lower funds being retained for investments and the more the company will have to place reliance on alternative sources of funds such as issue of additional shares and or debt capital to finance selected viable projects (Sindhu, 2014). The firms' profitability been considered as the primary determinant of the firms' capability to pay dividend currently and in the future prospect. Murekefu and Ouma (2012) conducted a study on the relationship between dividend payout and firm performance among firms listed on the Nairobi Security Exchange. They found that there is strong and positive relationship between dividend payout and performance. They also state that firms that pay high dividends without considering investment needs may therefore experience lower future earnings or decrease in firm value.

Amidu and Abor (2016) conducted the research on the determinants of dividend payout ratio in Ghana for a period of six years. The dependent variable is dividend payout ratio and independent variables profitability, institutional holdings, cash flow, sales growth, tax, market to book value and risk. They found a positive association between dividend payout and profitability, cash flow and tax and a negative association between dividend payout and risk, institutional holding, growth and market to book value. The significant variables were profitability, cash flow, sales growth and market to book value.

Al-Malkawi et al (2007) carried out the study on the determinants of dividend payout in Jordan of public firms listed on the Anman stock Exchange for a period from 1989 to 2000. Their findings showed that the insider and state ownership positively affect the amount of dividend payments. In addition to the results, size, age and profitability found to be determinants factor of dividend payout policy in Jordan. The results supported the agency hypothesis and are broadly consistent with the pecking order theory but not supported for the signaling hypothesis.

Biza-Khupe and Themba (2016) conducted on the relationship between dividend payout and financial performance of listed firms in Botswana. The dependent variable dividend payout and independent variables involve profitability, risk and size. Their results showed the positive relationship between profitability, firm size and dividend payout whereas systematic risk found negatively relationship.

Ijaiya, Sanni, Amujo and Suleiman (2014) on the relationship between dividend policy and financial performance used financial reports for five years; their findings show an insignificant relationship between dividend payout ratio and financial performance. Mutisya 2014 on the relationship between financial performance and dividend payout, firm size and leverage as independents variables for a period 2009 to 2013 using regression analysis, findings show a positive relationship between variable but there is a negative relationship between financial performance and leverage

Model of Specification

$$Y_{i,t} = \alpha_i + \beta X_{i,t} + \varepsilon_{i,t} \quad (1)$$

In equation (1), subscripts i and t respectively represents the cross-sectional and time series dimension of the data, while α and β also connotes constant and regression coefficients respectively. As $Y_{i,t}$ represents the dependent variable, $X_{i,t}$ represents the set of exogenous variables of firm I time t , and ε measures the error term. The specific panel regression equation used for the study is as follows:

$$DPR_{i,t} = \alpha_i + \beta_1 NPM_{i,t} + \beta_2 LEV_{i,t} + \beta_3 LIQ_{i,t} + \beta_4 GRO_{i,t} + \beta_5 SIZE_{i,t}$$

Where:

$$DPR_{i,t} = \text{Dividend payout}$$

The dividend payout ratio referred as a percentage, which paid to the investors or shareholders as a return of risk invested in the firms and reflected as a percentage of net income available to them after all expenses including interest and tax deducted.

$$\text{Dividend payout} = \frac{\text{Total dividend paid}}{\text{Net profit after tax}}$$

$$NPM = \text{Net Profit Margins}$$

Net profit margin (NPM): The net profit margin ration gives a good indication of the overall level of firm's profitability. This ratio indicates how much of each Rand obtained from firm's generated profit (Rehamn, Khan and Khokhar, 2014). It is important to note that net profit margins provide evidence to firm policies and decision regarding the dividends payments. The higher the profit margins the more effective the firm converting revenue into profit (Rehman et al, 2014, p. 187).

$$\text{Net profit margin} = \frac{\text{Net profit after tax}}{\text{Sales/Turnover}}$$

$$LEV_{i,t} = \text{Leverage}$$

The financial leverage ratio is the firm indicate the firm's ability to access external financing from money lenders or financial institutions. According to Ahmad and Wardani, (2014) described it as the ratio which measures the firm's method of financing and the firm's ability to meet its short-term obligation. According to Al-Malkawi (2007) has argued that the higher the financial leverage tend to lower the dividends payout ratio and transaction cost due to external financing. The study use debt to total asset ratio to measure leverage of firm.

$$\text{Debt to total asset ratio} = \frac{\text{Total debt}}{\text{Total asset}}$$

$$LIQUIDITY$$

Liquidity is measured by current assets divided by current liabilities and indicates the firm's ability to pay short-term liabilities (Mehta, 2012). The dividend payout is dependent on a firm's profitability and cash flow. Poor liquidity leads to a small dividend payout ratio (Kinfe, 2011). In measuring liquidity, which is an important factor for dividend payout, Al-shubiri (2011) and Mehta (2012) suggested the use of Current Ratio as a measure of liquidity.

$$LIQ = \frac{\text{Current assets}}{\text{Current liabilities}}$$

A firm's high growth in revenue will require greater financing. If a firm experiences high growth in revenue and investment opportunities it will need either internal or external financing, and will be more inclined to pay small or no dividends (Alzomaia and Al-Khadhiri, 2013).

$$GRO_{i,t} = \text{Asset growth}$$

The firm's high growth in revenue will have a greater need for financing purposes. If the firms experience high growth in revenue and investment opportunities which will need either internal or external financing, and thus tend to pay little or no dividends (Alzomaia and Al-Khadhiri, 2013).

$$\text{Assets growth} = \frac{\text{Asset (current)} - \text{Asset (previous)}}{\text{Asset (previous)}}$$

$$SIZE = \text{Total assets}$$

There are the different measures of size of the firm's other studies used employment, sales and market capitalization and total assets. The Size of the firm was measured by the natural logarithm of the book value of the firm's Total Assets.

$$\text{Size} = \text{Natural log of Total Assets}$$

The above equation indicates that the dividend payout ratio (DPO) serves as the dependent variable. This was used to measure Top 40 FTSE/JSE index firms' performance. Dividend payout ratio (DPR) was the dependent variable and explanatory variables included net profit margins (NPM), financial leverage (LEV), liquidity (LIQ), asset growth (GRO) and firm size (SIZE).

The Findings and Interpretation

It was important to check whether serial correlation exists between two series of observation, namely time series and cross-section data (Gujarati and Porter, 2009). Autocorrelation is mainly useful when conducting time series data. According to Nguimkeu and Rekkas (2011), the presence of autocorrelation results in biased hypothesis testing. The hypothesis testing using autocorrelation is as follows:

H_0 : shows that there is no autocorrelation.

H_1 : shows that there is autocorrelation.

The Durbin Watson (DW) test ranges from 0 to 4, where 2 represents that there is no autocorrelation (Kai *et al.*, 2014). Critical values between 1.5 and 2.5 are commonly accepted when using the Durbin Watson test. The decision rule indicates that H_0 is rejected is when d value is within 1.5 to 2.5, but otherwise H_0 is rejected as indicated in table 3 below.

Table 1. Descriptive Analysis

| | DPR | NPM | LEV | LIQ | GRO | SIZE |
|---------------------|---------|---------|--------|--------|---------|---------|
| Mean | 0.3740 | 0.1077 | 0.6675 | 0.9211 | 0.1468 | 18.1542 |
| Median | 0.3637 | 0.0443 | 0.6927 | 0.9428 | 0.0889 | 17.9326 |
| Maximum | 3.7734 | 3.8019 | 1.2383 | 4.9148 | 10.7489 | 21.3938 |
| Minimum | -1.2640 | -0.5625 | 0.0040 | 0.0000 | -1.0000 | 15.5032 |
| Std. Dev. | 0.4666 | 0.3010 | 0.2782 | 0.9874 | 0.9193 | 1.4165 |
| Observations | 120 | 120 | 120 | 120 | 120 | 120 |

Source: E-views output

The table 1 indicate the summary of descriptive statistics of Top 40 FTSE/JSE companies indicate the mean of DPR has average 0.3740, its standard deviation is 0.4666 with minimum of -1.2640 and maximum of 3.7734 respectively. While Net profit margins (NPM), Leverage (LEV), liquidity (LIQ) and size (SIZE) had average mean, 0.07193, 0.1077, 0.6675, 0.9211, 0.1468, 18.1542 and Standard deviation of 0.1065, 0.3010, 0.2782, 0.9874, 0.9193, 1.4165 minimum, -.02371, -0.5625, 0.0040, 0.0000, -1.0000, 15.5032 and maximum of 1.0438, 3.8019, 1.2383, 4.9148, 10.7489, 21.3938 respectively.

Table 2. Correlation Analysis of Variables

| Correlation Probability | DPR | NPM | LEV | LIQ | GRO | SIZE |
|-------------------------|---------|---------|---------|---------|---------|--------|
| DPR | 1.0000 | | | | | |
| ROA | 0.2135 | | | | | |
| NPM | 0.2486 | 1.0000 | | | | |
| LEV | 0.1918 | -0.1822 | 1.0000 | | | |
| LIQ | -0.3159 | 0.2964 | -0.6376 | 1.0000 | | |
| GRO | 0.0046 | 0.01129 | 0.0402 | 0.0213 | 1.0000 | |
| SIZE | 0.0652 | 0.1497 | 0.3574 | -0.3292 | -0.2249 | 1.0000 |

Source: E-views output

Table 2 showed that that net profit margin (NPM), leverage (LEV), growth (GRO), and Size (SIZE) are positively related to dividend payout ratio. An increase in this variables lead to an increase in dividend payout ratio by 0.2135, 0.2486, 0, 1918, 0.0046, and 0.0652 respectively. Only liquidity (LIQ) is negatively related to dividend payout ratio (DPR) by -1.2640.

Table 3. Regression Analysis

| Dependent variable : DPR | | | | | |
|--------------------------|------------------------|-------------------------|-----------------------|-------------------------|--|
| | Random effect model | Pooled effect robust | Fixed effect robust | GLS robust | |
| NPM | 0.9282*** (3.9070) | 0.9292*** (4.1928) | 1.0106*** (3.5067) | 0.9292*** (4.1928) | |
| LEV | 0.0717 (3.3913) | -0.0627 (-0.4341) | 0.6282 (1.2530) | -0.0627 (0.5330) | |
| LIQ | -0.0863** (-2.1996) | -0.1282*** (-3.3636) | -0.0702 (-1.5340) | -0.1282*** (-3.3636) | |
| GRO | -0.0094 (-0.4420) | -0.0063 (-0.2667) | -0.0041 (-0.1864) | -0.0063 (-0.2668) | |
| SIZE | -0.0377 (-1.1296) | -0.0463 (-1.9831) | 0.0515 (0.5862) | -0.0463** (-1.9831) | |
| _cons | -1.9891 | 1.2774** | -1.03011 | 1.2774*** | |

| | | | | |
|-----------------------------|----------------|---------------|---------------|----------|
| | (-1.6480) | (2.9649) | (-0.6237) | (2.9649) |
| N | 120 | 120 | 120 | 120 |
| R-squared | 0.1520 | 0.2187 | 0.5093 | |
| Durbin Watson (DW) | 1.7088 | 1.3139 | 2.0544 | |
| F-stat | 4.0871 | 6.1662 | 4.1086 | |
| Prob> F-stats | 0.0019 | 0.0000 | 0.0000 | |
| Hausman Test | 5.6034 | | | |
| Prob> chi2 | 0.34670 | | | |
| t statistics in parentheses | | | | |
| * p<0.10 | " ** p<0.05" | "*** p<0.01" | | |

Source: author own compilation

Table 4. Hausman

Correlated Random Effects: Hausman Test

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|----------------------|-------------------|--------------|--------|
| Cross-section random | 5.603381 | 5 | 0.3467 |

Source: E-views output

Table 4 Hausman test with a p-value of greater than 5% which accept null hypothesis that random effect model appropriate, therefore the fixed effect model model is not appropriate since the p-value is 0.3467.

Table 4.1. Results Hausman Test Equation 2

| 20 firms from Top 40 FTSE/JSE No: observation 120 | Cross section Chi-square statistics | Decision |
|--|---|---------------------|
| | 5.603381 | Random effect model |
| Hypothesis testing | H_0 : Random effect is appropriate H_1 : Fixed effect model is appropriate | |

*, ** and *** indicates significance at 10%, 5% and 1% respectively.

Panel regression analysis involve pooled, fixed effect and random effect model and the choice between fixed effect and random effect is finalised by hausman specification test (1978) therefore the results of the study is based on random effect model. The regression results found negative relationship between dividend payout ratio of Top40 firms with profitability and liquidity, positive relationship were found on dividend payout (DPR) with net profit margins (NPM), leverage (LEV), growth (GRO), and firm size (SIZE).

Table 5. Summary of Research Hypothesis and Decision

| Research hypothesis of study | Decision of full model (2010-2015) |
|--|------------------------------------|
| | Reject/Do not reject H_0 |
| H_1 : There is a positive relationship between dividend payout and profitability. | Reject H_0 |
| H_2 : There is a positive relationship between dividend payout ratio and net profit margins. | Do not reject H_0 |
| H_3 : There is a negative relationship between dividend payout ratio and financial leverage. | Reject H_0 |
| H_4 : There is a positive relationship between dividend payout and liquidity. | Reject H_0 |
| H_5 : There is a positive relationship between dividend payout and growth in assets. | Do not reject H_0 |
| H_6 : There is a positive relationship between dividend payout ratio and firm size. | Do not reject H_0 |

Source: Author own compilation

4. Findings and Discussion of the Results

The findings demonstrated that net profit margin had a positive significant relationship with dividend payout ratio, and a negative insignificant relationship between growth and size with dividend payout was found. Liquidity has a negative relationship whereas leverage reports a positive relationship with dividend payout ratio. The findings imply that in the Top 40 FTSE/JSE firms, large size firms pay less dividends, more firms that are profitable pay more dividends, higher leverage firms pay dividends, many current asset firms pay lower dividends, and finally lower growth firms pay higher dividend.

The study focused on a quantitative study and applied the ordinary least square (OLS) to address the research hypothesis on the relationship between dividend payout and financial performance. The study was intended to fill a gap in the knowledge in this study area, which has not been researched by many scholars in South Africa. The current study investigated the relationship between dividend payout and financial performance of 20 firms selected from the Top 40 FTSE/JSE listed companies, taken from the McGregor and Bloomberg annual report.

Table 6. Possible reason for contradicting results on some variables

| Variables | Possible reason |
|--------------------------|---|
| Financial leverage (LEV) | Top40 JSE firms make use of internal financing that influence the low dividends payout to its shareholders. |
| Liquidity (LIQ) | To40 JSE firms have poor liquidity in relation to dividends payout that could be due to shortage of cash flow available |
| Growth (GRO) | Top40 JSE firms pay less dividends which resulted in an increases the retained earnings for future investment opportunities |
| Firm Size (SIZE) | Top40 JSE firms are well established recently and less likely to be matured. |

5. Recommendations for Future Research

The financial performance was limited to Top 40 FTSE/JSE firms. The area of research was comparable to other emerging countries. The sampling of the study was limited to Top 40 FTSE/JSE firms, and was a small sample. In further research, the sample should be enlarged in order to increase the accuracy of the results. Further research could be conducted using the International Financial Reporting Standard (IFRS).

Future studies could use primary data, which would provide the views of managers, investors, brokers and lawmakers on the dividend policy and behaviour of emerging markets. Furthermore, such a study could be conducted into the legal aspects of dividend policy in emerging markets; this could influence the regulatory bodies. Factors such as inflation, gross domestic product, interest and economic recession could be investigated in Top 40 FTSE/JSE firms using other methodology, which considers.

Investors

The study will help South African investors to be in a better position to make decisions on firms they would prefer to invest in.

Managers

The study will assist managers to declare dividends that give a positive future image of a firm.

Financial Analysis

This will increase their knowledge in relation to dividends therefore; they can give advice to their clients with more confidence.

Academicians

This will add to the body of knowledge in finance and create room for further research.

Creditors

6. Conclusions

The main objective of the study was to establish the relationship between dividend payout and financial performance of Top 40 FTSE/JSE firms for a period of six years, from 2010 until 2015. The random effect regression model was used to determine the relationship. The study found that there was a positive and significant relationship between dividend payout and financial performance.

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Appendix

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|----------------------|-------------------|--------------|--------|
| Cross-section random | 5.603381 | 5 | 0.3467 |

Cross-section random effects test comparisons:

| Variable | Fixed | Random | Var(Diff.) | Prob. |
|----------|-----------|-----------|------------|--------|
| NPM | 1.010545 | 0.928156 | 0.026608 | 0.6135 |
| LEV | 0.628158 | 0.071672 | 0.217797 | 0.2331 |
| LIQ | -0.070245 | -0.086341 | 0.000556 | 0.4950 |
| GRO | -0.004094 | -0.009361 | 0.000034 | 0.3656 |
| SIZE | 0.051503 | -0.037659 | 0.006607 | 0.2727 |

Cross-section random effects test equation:

Dependent Variable: DPR

Method: Panel Least Squares

Date: 06/05/19 Time: 09:56

Sample: 2010 2015

Periods included: 6

Cross-sections included: 20

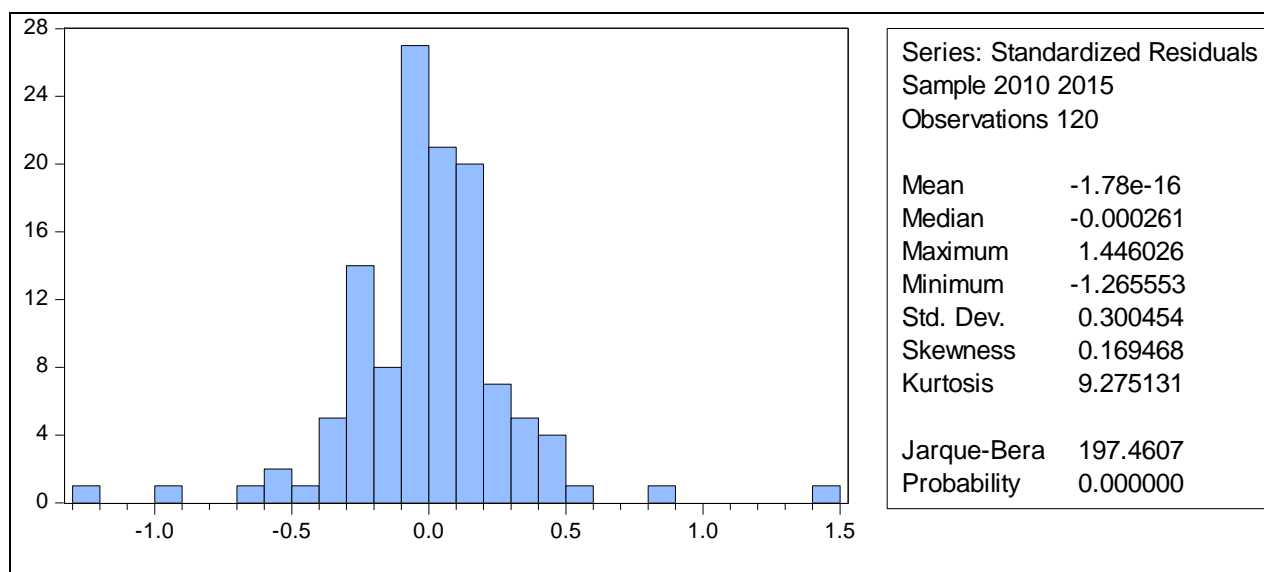
Total panel (balanced) observations: 120

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| C | -1.030110 | 1.651502 | -0.623741 | 0.5343 |
| NPM | 1.010545 | 0.288173 | 3.506725 | 0.0007 |
| LEV | 0.628158 | 0.501343 | 1.252951 | 0.2133 |
| LIQ | -0.070245 | 0.045793 | -1.533991 | 0.1284 |
| GRO | -0.004094 | 0.021965 | -0.186377 | 0.8525 |
| SIZE | 0.051503 | 0.087854 | 0.586230 | 0.5591 |

Effects Specification

Cross-section fixed (dummy variables)

| | | | |
|--------------------|----------|-----------------------|----------|
| R-squared | 0.509311 | Mean dependent var | 0.366927 |
| Adjusted R-squared | 0.385347 | S.D. dependent var | 0.336521 |
| S.E. of regression | 0.263832 | Akaike info criterion | 0.356043 |
| Sum squared resid | 6.612694 | Schwarz criterion | 0.936771 |
| Log likelihood | 3.637411 | Hannan-Quinn criter. | 0.591879 |
| F-statistic | 4.108551 | Durbin-Watson stat | 2.054391 |
| Prob(F-statistic) | 0.000000 | | |



Source: E-views output

Table 1. Pooled Effect Model

Dependent Variable: DPR
 Method: Panel Least Squares
 Date: 06/04/19 Time: 15:24
 Sample: 2010 2015
 Periods included: 6
 Cross-sections included: 20
 Total panel (balanced) observations: 120

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | 1.277402 | 0.430837 | 2.964934 | 0.0037 |
| NPM | 0.929179 | 0.221615 | 4.192756 | 0.0001 |
| LEV | -0.062684 | 0.144402 | -0.434091 | 0.6650 |
| LIQ | -0.128163 | 0.038103 | -3.363599 | 0.0010 |
| GRO | -0.006304 | 0.023636 | -0.266711 | 0.7902 |
| SIZE | -0.046332 | 0.023363 | -1.983105 | 0.0498 |
| R-squared | 0.212876 | Mean dependent var | | 0.366927 |
| Adjusted R-squared | 0.178353 | S.D. dependent var | | 0.336521 |
| S.E. of regression | 0.305039 | Akaike info criterion | | 0.511951 |
| Sum squared resid | 10.60755 | Schwarz criterion | | 0.651325 |
| Log likelihood | -24.71705 | Hannan-Quinn criter. | | 0.568552 |
| F-statistic | 6.166221 | Durbin-Watson stat | | 1.313903 |
| Prob(F-statistic) | 0.000043 | | | |

Table 2. Fixed Effect Model

Dependent Variable: DPR
 Method: Panel Least Squares
 Date: 06/04/19 Time: 15:24
 Sample: 2010 2015
 Periods included: 6
 Cross-sections included: 20
 Total panel (balanced) observations: 120

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|-------|
|----------|-------------|------------|-------------|-------|

| | | | | |
|------|-----------|----------|-----------|--------|
| C | -1.030110 | 1.651502 | -0.623741 | 0.5343 |
| NPM | 1.010545 | 0.288173 | 3.506725 | 0.0007 |
| LEV | 0.628158 | 0.501343 | 1.252951 | 0.2133 |
| LIQ | -0.070245 | 0.045793 | -1.533991 | 0.1284 |
| GRO | -0.004094 | 0.021965 | -0.186377 | 0.8525 |
| SIZE | 0.051503 | 0.087854 | 0.586230 | 0.5591 |

Effects Specification

Cross-section fixed (dummy variables)

| | | | |
|--------------------|----------|-----------------------|----------|
| R-squared | 0.509311 | Mean dependent var | 0.366927 |
| Adjusted R-squared | 0.385347 | S.D. dependent var | 0.336521 |
| S.E. of regression | 0.263832 | Akaike info criterion | 0.356043 |
| Sum squared resid | 6.612694 | Schwarz criterion | 0.936771 |
| Log likelihood | 3.637411 | Hannan-Quinn criter. | 0.591879 |
| F-statistic | 4.108551 | Durbin-Watson stat | 2.054391 |
| Prob(F-statistic) | 0.000000 | | |

Table 3. Random Effect

Dependent Variable: DPR

Method: Panel EGLS (Cross-section random effects)

Date: 06/04/19 Time: 15:25

Sample: 2010 2015

Periods included: 6

Cross-sections included: 20

Total panel (balanced) observations: 120

Swamy and Arora estimator of component variances

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| C | 0.989090 | 0.600177 | 1.647997 | 0.1021 |
| NPM | 0.928156 | 0.237562 | 3.906997 | 0.0002 |
| LEV | 0.071672 | 0.183159 | 0.391311 | 0.6963 |
| LIQ | -0.086341 | 0.039252 | -2.199639 | 0.0299 |
| GRO | -0.009361 | 0.021179 | -0.441994 | 0.6593 |
| SIZE | -0.037659 | 0.033337 | -1.129639 | 0.2610 |

Effects Specification

| | S.D. | Rho |
|----------------------|----------|--------|
| Cross-section random | 0.163783 | 0.2782 |
| Idiosyncratic random | 0.263832 | 0.7218 |

Weighted Statistics

| | | | |
|--------------------|----------|--------------------|----------|
| R-squared | 0.152008 | Mean dependent var | 0.201613 |
| Adjusted R-squared | 0.114816 | S.D. dependent var | 0.281162 |
| S.E. of regression | 0.264529 | Sum squared resid | 7.977233 |
| F-statistic | 4.087051 | Durbin-Watson stat | 1.708795 |
| Prob(F-statistic) | 0.001890 | | |

Unweighted Statistics

| | | | |
|-------------------|----------|--------------------|----------|
| R-squared | 0.202866 | Mean dependent var | 0.366927 |
| Sum squared resid | 10.74245 | Durbin-Watson stat | 1.268933 |

Table 4. GMM

Dependent Variable: DPR
 Method: Generalized Linear Model (Newton-Raphson / Marquardt steps)
 Date: 06/04/19 Time: 15:26
 Sample: 2010 2015
 Included observations: 120
 Family: Normal
 Link: Identity
 Dispersion computed using Pearson Chi-Square
 Convergence achieved after 1 iteration
 Coefficient covariance computed using observed Hessian

| Variable | Coefficient | Std. Error | z-Statistic | Prob. |
|-----------------------|-------------|--------------------|-------------|-----------|
| C | 1.277402 | 0.430837 | 2.964934 | 0.0030 |
| NPM | 0.929179 | 0.221615 | 4.192756 | 0.0000 |
| LEV | -0.062684 | 0.144402 | -0.434091 | 0.6642 |
| LIQ | -0.128163 | 0.038103 | -3.363599 | 0.0008 |
| GRO | -0.006304 | 0.023636 | -0.266711 | 0.7897 |
| SIZE | -0.046332 | 0.023363 | -1.983105 | 0.0474 |
| Mean dependent var | 0.366927 | S.D. dependent var | | 0.336521 |
| Sum squared resid | 10.60755 | Log likelihood | | -24.79465 |
| Akaike info criterion | 0.513244 | Schwarz criterion | | 0.652619 |
| Hannan-Quinn criter. | 0.569845 | Deviance | | 10.60755 |
| Deviance statistic | 0.093049 | Restr. deviance | | 13.47634 |
| LR statistic | 30.83111 | Prob(LR statistic) | | 0.000010 |
| Pearson SSR | 10.60755 | Pearson statistic | | 0.093049 |
| Dispersion | 0.093049 | | | |