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| **Determinants of Corporate Dividend policy under Hyperinflation and Dollarization by Firms in Zimbabwe**  **By**  **S. Mbulawa[[1]](#footnote-1), N. F. Okurut[[2]](#footnote-2), M. M. Ntsosa[[3]](#footnote-3), N. Sinha[[4]](#footnote-4).**  There has been little attempt to examine the applicability of the Lintner model and its extension in the context of hyperinflation and dollarization. There is lack of clarity on the best measure of dividend policy and the perceived non-linearity in the determinants of dividend policy. This study analyses dividend policy to enhance our understanding and applicability of dividend theories within the context of hyperinflation and dollarization; determines the key determinants of dividend policy and bring out the perceived non-linearities between dividend policy and selected variables; examines the impact of other corporate financial decisions on dividend policy and identifies the best measure of dividend policy in this context.  The study employed panel data for Zimbabwe listed firms for the period 2000 to 2016. Panel ordinary least squares (OLS) and generalized methods of moments (GMM) techniques were employed.  Results suggest that the Lintner model was applicable under hyperinflation. The model can be extended and specified as a non-linear function. The study showed that dividend policy is accurately captured using dividend per share. This clarifies the mixed views in literature which suggested that dividend policy can be captured using different variables. The study confirms the existence of non-linearity between dividend policy and explanatory variables (inside ownership, firm size and earnings per share). Furthermore, financing and investment decisions were important in explaining dividend policy. The effect of explanatory variables was sensitive to the sample period, method of estimation (GMM or fixed effects) and the measure of the dependent variable employed. This study provides some policy implications.  **Key words:** Dividend Policy, Hyperinflation, Dollarization, Linter Model, Zimbabwe  **JEL**: G320 G350 G390 |

# 1. Introduction

The pioneering work by Modigliani and Miller (1961) affirm that firm value is insensitive to dividend policy under perfect market conditions. Dividends are a residual paid when a firm fails to profitably invest excess earnings. Investors perceive changes in dividends as a signal indicating management’s expectation about future earnings. The transactions cost theory (Fama, 1974, Higgins, 1972) shows that high costs of raising finance cause firms to reduce dividend payouts to avoid sourcing expensive external finance. This is consistent with the pecking order hypothesis (POH) which shows that excess funds should be availed for investment opportunities as opposed to dividend payout (Myers and Majluf, 1984).

However, markets are imperfect (Gordon, 1963, Lintner, 1962, Jambawo, 2014) as such dividends affect firm value. The agency costs theory argues that payment of dividends removes excess cash which managers may use for non-productive purposes (Easterbrook, 1984, Jensen, 1986). The clientele theory (Allen at el, 2000, Seida, 2001, Shefrin and Thaler, 1988) argues that dividend policy is relevant only when the supply and demand of high dividend paying stocks differ. Taxation on dividends is less and hence they attract institutional investors. The bird in hand theory argues that investors the fear of risk by investors make them to prefer current as opposed to future dividends. Investor uncertainty falls away as they receive dividends in the current period and they discount cash flows using a lower rate giving rise to high firm value. Thus, firm value falls due to non-payment of dividends (Gordon, 1963, Lintner, 1962).

The Zimbabwe has a financial sector that comprises of the financial services sector and the stock market. Regulation of the financial services sector is mainly done by the Reserve Bank of Zimbabwe (RBZ), while insurance and pension firms fall under the Registrar of insurance. The stock market is regulated by the Securities and Exchange Commission (SEC). The country experienced hyperinflation between 1997 and 2008. This followed the land reform that was done to compulsorily acquire land from the white minority and give it to the landless black majority (Mandizha, 2014, Kararach et al, 2010). The decisions to pay gratuities to war veterans and finance the war in Democratic Republic of Congo did not receive support from the international community. Consequently, the International Monetary Fund (IMF) and the World Bank (WB) withdrew their financial support and the government responded by printing money to finance recurrent expenditure. Inflation worsened, and the rate of economic activity fell coupled by a decline in firms’ production to levels below 40% and unemployment worsened. Firms (Njanike et al, 2009, Chiwandamira, 2009) survived on speculative profits, investing in stable currencies and stock piling, asking for shorter payback and the level of dividend payout fell due to low real profits. In 2009 the government adopted a multi-currency regime composed of the United States Dollar, South African Rand and Botswana Pula which became legal tender and immediately inflation fell to single digit. The economy and exchange rates stabilized, speculative activities and opportunities arbitrage profits ceased (Kararach et al, 2010; Sikwila, 2013). However, the country still experiences liquidity problems due to the loss of the lender of the last resort function by the Reserve Bank of Zimbabwe (RBZ). Firms are still unstable which affects the level of dividends distributed to shareholders. Formulating a policy on corporate dividend decisions is still important for firm managers under dollarization period as well. The annual headline inflation has been below 5% during the greater part of 2018. It surged to 21% in October 2018 and to 42.1% in December 2018. Inflationary pressures are a result of increased speculative tendencies and ever rising foreign currency rates on the parallel market (RBZ, 2019).

The case of Zimbabwe is rare, to find, where a country moves from hyperinflation to dollarization and immediately inflation becomes single digit. Literature is not yet clear on how firms make decisions on whether pay or not to pay dividends in this context. The dearth of studies focusing on dividend policy under these unique conditions limits our understanding. The understanding of main corporate dividend theories may change, the testing of which has not been done under these conditions. Potential non-linearity in the determinants of dividend policy have not been discussed in this context. Findings lack consensus on the best measure of corporate dividend policy and they are also country specific. The explanatory power of variables and acceptable theoretical propositions are expected to change under the two periods. Previous studies (Mutenheri, 2003, Elly and Hellen, 2013, Mirbagherijam, 2014, Nor, 2012, Pesantes, 2005) focused on dollarization and hyperinflation but they fail to explain the dynamics in dividend policy within the context of this study. Thus, policy options based on previous studies fail to speak to a firm manager in Zimbabwe and within the context of an emerging market. The analysis of dividend policy under the special case of Zimbabwe brings new insights into this debate and widens the scope for policy making. In view of this, the main objectives of study are to: analyse dividend policy to enhance our understanding and applicability of dividend theories within the context of hyperinflation and dollarization; determine the key determinants of dividend policy and bring out the perceived non-linearities between dividend policy and selected variables; examine the impact of other corporate financial decisions on dividend policy and identify the best measure of dividend policy in this context.

This study shows that the Lintner model is applicable under hyperinflation, it can be extended and specified as a non-linear function. Dividend policy is best captured using dividend per share (PR1) which clarifies the mixed views in literature on the best measure of dividend policy. Results confirmed the existence of non-linearity between dividend policy and explanatory variables (inside ownership, firm size and earnings per share). Furthermore, financing and investment decisions were important in explaining dividend policy. The effect of explanatory variables was sensitive to the sample period, method of estimation and the measure of the dividend policy employed.

The rest of the study is organized as follows: section two discusses the theoretical framework and provides evidence from previous studies, section three discusses the methodology and data, section four discusses the results and section five concludes and provides policy implications.

# 2. Literature Review

The work on dividend policy has been ongoing in both developed and developing markets. The dynamics involved have differed from country to country with no consensus on the way firms behave. Berkley and Myers (2005) argued that the lack of consensus has been attributable to differences in the level of development of capital markets and the institutional differences among other factors. Such differences, it is argued, would be explained by differences in firm specific, macroeconomic and global factors. Research has been done but results have failed to uncover the rationale behind differences in dividend policy among firms. Patterns of corporate dividend policy are also dependent on the level of development of markets in which firms operate. For example, firms in emerging markets face low payout ratios than those in developed markets. Developing markets have more information inefficiencies, volatility and they are smaller in size. Their ownership structure, taxation policies and governance differ from those in developed markets. Some emerging economies face financial constraints which may explain the patterns in the payment of dividends (Glen et al, 1995, Ramcharran, 2001).

## 2.1. Theoretical Framework

According to Lintner (1956) firms have target payout ratios,, applied to current profits after tax (). Adjustment rates,, defining the actual change in dividends and remains stable for firms across time since investors prefer stable dividends. Lintner developed a partial adjustment model to capture changes in dividend levels between any two periods. The model was based on the premise that managers are concerned with stability of dividend payments and hence they monitor the actual changes in dividends () from one period to the next. This is shown as

 (2.1)

Where,

and  (2.2)

Dividends in the current and previous years are represented by  and  respectively, is the dividend that the firm targets to pay. The theoretical dividend model 2.1 can be written as

 , (2.3)

Where:and , is the error term and is a constant which is normally positive to show the reluctance by managers to cut dividends. The pattern of dividends becomes a smoothed pattern of earnings and shows the time path of permanent earnings. The Lintner model has been tested before by establishing factors that explain, establishing the target payout ratio that firms aim to achieve,, and the significance of  in explaining dividend policy. These three factors have been found to be important in explaining the partial adjustment model. Previous studies (Tran and Nguyen, 2014, King’wara, 2015, He et al, 2016) have employed dividend per share data to measure dividend policy for listed firms. According to Ahmad and Javid (2009) the model by Lintner can be extended by bringing in other variables that affect a firm’s dividend policy. Thus, an extended version of model (2.3) was tested by incorporating other determinants of dividend policy that are outlined in the methodology section. Furthermore, moving away from the world of Miller and Modigliani, the issues surrounding the dividend policy have become complicated. The introduction of market imperfections changes the way we understand the firm dividend policy. Again, dividend policy would be connected, not only to the firm value, to other decisions that the firm has to make. It is therefore appropriate to reaffirm that dividend policy interacts with financing and investment decisions, once we introduce imperfections in the analysis. For example, Al-Najjar and Belghitar (2011) argued that dividends and investment decisions are negatively related. This was supported by previous studies (Baker et al, 2013 and Bildik et al, 2015) which opined that large firms can still pay dividends in the absence of credible growth opportunities. Furthermore, Lahiri and Chakraborty (2014) conducted a study to examine the link among dividend, financing and investment decisions as suggested by the simultaneous dividend theory. Their findings showed that dividend and investments decisions are made by firms at the same time.

## 2.2. Empirical Review

Several studies have been done in developed countries, developing countries and in the African context. They have shown various determinants of dividend policy. They fail to relate their findings in the context of this study and results are mixed. This validates the claim that policy making in emerging markets may not entirely rely on studies done elsewhere. Previous studies mainly relied on panel regression techniques like panel ordinary least squares (OLS), fixed effects (FE) and dynamic model using the Generalized methods of Moments (GMM). Dividend policy has been mainly explained by previous year’s dividend, firm growth, financial leverage, inflation, investment decisions, money supply, taxation paid, firm size, earnings per share and ownership variables. Past studies found mixed effects for these variables and results on the impact of each variable on dividend policy remain inconclusive. Furthermore, there are studies that argued that variables like firm growth (Nguyen et al, 2013; Zameer et al, 2013, Ahmad and Javid, 2009), financial leverage (Javid, 2009, Farinha, 2003, Rizqia and Sumiati, 2013), inflation (Mambo, 2012, Elly and Hellen, 2013), managerial ownership (Nguyen et al, 2013, Arshad et al, 2013, Hosain, 2016), firm size (Zameer et al, 2013, Huda and Abdullah, 2013, Rizqia and Sumiati, 2013), money supply (Mambo, 2012, Mohsin and Ashraf, 2011) and taxation (Hassan et al, 2013, Khan et al, 2013) have no effect on dividend policy. Table 2.1 summarizes the determinants of dividend policy in previous studies.

Previous studies showed that dividend behavior may be similar in the different jurisdictions as it is explained by the same group of factors. However, the differences in dividend policies result in differing sensitivities of dividend payouts to financial variables. Studies fail to incorporate other important factors which can be macroeconomic and qualitative in nature. They fail to explain the non-linearity of the relationship between financial variables and dividend payout which is important for policy making. Leading financial and fundamental factors explaining dividend behavior have not been isolated in literature. There are no studies analyzing dividend policies in the context of hyperinflation and dollarization. There is no evidence on whether firms should pay dividends and if so how much? The issues have helped in further development of this study.

**Table 2.1: Determinants of Dividend Policy**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Significant Positive Effect** | **Significant Negative Effect** | **Insignificant Effect** |
| Previous Dividends | Zameer et al, 2013, Ahmad and Javid, 2009, Alzomaia & Al-Khadhiri, 2013, Edmund, 2018, Mirbagherijam, 2014, Tran and Nguyen, 2014 |  |  |
| Firm Growth (FG) | Amidu, 2007, Mutenheri, 2003, Basiddiq and Hussainey, 2012, Hosain, 2016, Bushra and Mirza, 2015. | Arshad et al, 2013, Michaely and Roberts, 2012, Farinha, 2003, Gill et al, 2010, Kania and Bacon, 2005, King’wara, 2015, Bushra and Mirza, 2015 | Nguyen et al, 2013; Zameer et al, 2013, Ahmad and Javid, 2009, Al-Kuwari, 2009, Gupta and Banga, 2010, Edmund, 2018, Farinha, 2003, Alzomaia & Al-Khadhiri, 2013, Gangil and Nathani, 2018. |
| Leverage (FLEV6) | Nguyen et al, 2013, Ahmad and Javid, 2009, Kania and Bacon, 2005, Arshad et al, 2013, Jiranyakul and Jiang, 2013, Gill et al, 2010, | Al-Najjar and Kilincarslan, 2018, Ahmad and Javid, 2009, Hosain, 2016, Uwuigbe, 2013, Huda and Abdullah, 2013, Edmund, 2018, King’wara, 2015, Michaely and Roberts, 2012, Al-Kuwari, 2009 | Zameer et al, 2013, Ahmad and Javid, 2009, Farinha, 2003, Rizqia and Sumiati, 2013, Alzomaia & Al-Khadhiri, 2013, |
| Inflation (INFLN) | Mirbagherijam, 2014, Basse, 2009, Ghafoor et al, 2014 | Edmund, 2018, Khan et al, 2013, Tesfaye, 2017 | Mambo, 2012, Elly and Hellen, 2013 |
| Inside ownership (OWN1) | Zameer et al, 2013, Saez and Gutierrez, 2015, Michaely and Roberts, 2012 | Farinha, 2003, Rizqia and Sumiati, 2013, Kania and Bacon, 2005 | Nguyen et al, 2013, Arshad et al, 2013, Gupta and Banga, 2010, Hosain, 2016 |
| Firm Size (SIZE2) | Al-Najjar and Kilincarslan, 2018, Uwuigbe, 2013, Arif & Akbar, 2013, Al-Kuwari, 2009, Arshad et al, 2013, Michaely and Roberts, 2012, Faff et al, 2016 | King’wara, 2015, Farinha, 2003, Bushra and Mirza, 2015 | Zameer et al, 2013, Huda and Abdullah, 2013, Rizqia and Sumiati, 2013, Hosain, 2016 |
| Money Supply (MSP) | Pandey and Bhat, 2004 | Akyildirim et al, 2013 | Mambo, 2012, Mohsin and Ashraf, 2011 |
| Earnings per Share (EPS) | Ahmad and Javid, 2009, Alzomaia & Al-Khadhiri, 2013, Mirbagherijam, 2014, King’wara, 2015, Tran and Nguyen, 2014 |  |  |
| Taxation Paid (TP) | Rehman and Takumi, 2012 | Arif & Akbar, 2013, Chetty and Saez, 2010, Morck and Yeung, 2005, Chuang et al, 2018, | Gul et al, 2012, Hassan et al, 2013, Khan et al, 2017 |
| Investment Decisions (INV1) | Adediran and Alade, 2013 | Al-Najjar and Belghitar, 2011 |  |
| Institutional Ownership (OWN5) | Farinha, 2003, Allen et al, 2000 and Bozec et al, 2010, Bjorn and Eriksson Lantz, 2016 | Kania and Bacon, 2005, Huda and Abdullah, 2013, Bushra and Mirza, 2015 |  |

# 3. Data and Methodology

## 3.1. Model Specification

The Levin, Lin and Chu (LLC) and Im, Pesaran and Shin (IPS) were used to test for unit root. The best panel ordinary least squares (OLS) estimation method was selected by applying tests on redundant fixed effects and the Hausman (1978) test on random effects panel OLS. The panel OLS model was specified as:

(3.1)

Where:  measures dividend policy, explanatory variables are captured using two composite variables: *firm and macro* as discussed. is a vector of parameters to be estimated. The error term () captures individual specific or time invariant component () and a remainder component (). Diagnostic tests (coefficient and residual diagnostics) were applied on the FE model.

The dynamic model explained the impact of previous dividends on current levels as specified in the Lintner model. The study also employed the generalized method of moments (GMM) by Arellano and Bond (1991). The model used a lag in adjusting towards the desired level of corporate dividend policy (Myers, 1977). The dynamic model was specified as follows:

, (3.2)

Where, is a measure of dividend decisions, is a vector of explanatory variables, . All variables that were employed are defined in Table 3.1.

## 3.2. Description of Variables and Expected Signs

Dividend policy (PR) was measured using 3 variables to check for robustness of results (Table 3.1). It was specified as a function of firm and macro variables as follows.

(3.3)

Highly levered firms (LEV) pay less dividends due to high debt service costs (Al-Najjar and Kilincarslan, 2018, Edmund, 2018). More dividends can be paid where a firm relies on other sources of cash flows (Arshad et al, 2013, Nguyen et al, 2013). Payment of dividends may differ according to debt composition. High investment expenditure (INV) reduces the likelihood of paying dividends (Al-Najjar and Belghitar, 2011). Firms with more investment opportunities may source external funding where access to financial markets is easy and they can still maintain dividend payouts (Adediran and Alade, 2013). High earnings per share (EPS) guarantee payment of more dividends (Mirbagherijam, 2014, King’wara, 2015). Again, firms may not necessarily make huge dividend disbursements as they seek to retain funds for future use. More dividends are paid where managers seek to reward themselves using free cash flows (Zameer et al, 2013, Saez and Gutierrez, 2015). On the other hand, managerial ownership (OWN) may mean that managers would postpone the payment of dividends and invest to increase the firm’s future income generating capacity (Farinha, 2003, Rizqia and Sumiati, 2013). Institutional ownership (OWN5) provides an effective monitoring device for firms to help reduce overinvestment by firm managers. It reduces payment of dividends (Huda and Abdullah, 2013, Bushra and Mirza, 2015). On the other hand, firms with good capital base may still pay dividends as institutional investors as they may not need to retain additional funds (Farinha, 2003, Allen et al, 2000 and Bozec et al, 2010). Taxation (TP) reduces funds available for payment of dividends (Arif & Akbar, 2013, Morck and Yeung, 2005, Chuang et al, 2018). Taxation may have a positive relationship with dividend payout where firm managers have chosen a certain dividend policy, desire to use dividends as a sweetener to retain investors or have access to other financing alternatives (Rehman and Takumi, 2012). Large sized firms (SIZE2) pay more dividends as they are likely to be financially stable (Al-Najjar and Kilincarslan, 2018, Uwuigbe, 2013, Arif & Akbar, 2013). These firms could have taken more debt to finance their current levels of growth. This would reduce payment of dividends as they service past debts (King’wara, 2015, Bushra and Mirza, 2015). Inflation (INFN) and money supply (MSP) were useful in controlling for hyperinflation and dollarization respectively as firms designed their dividend policy (Mirbagherijam, 2014, Ghafoor et al, 2014, Akyildirim et al, 2013). Firms are expected to have reduced dividends payout under hyperinflation and more payouts during dollarization period.

**Table 3.1: Variables Definitions and expected signs**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Definition** | **Expected signs** |
| Dividend Decisions (PR1) | Dividend paid/Total Shares | Dependent variable |
| Dividend Decisions (PR2) | Dividend Paid/Net Income | Dependent variable |
| Dividend yield (DYD) | DPS/Market price per share | Dependent variable |
| Firm growth (FG) | % Change in total sales ((Current year Sales-Previous year Sales)/Previous Year Sales) | +/- |
| Leverage (Flev 6) | Total debt/equity | +/- |
| Investment decisions (INV1) | Net Fixed Assets (Total Fixed Assets-Total Liabilities-Depreciation)/Total Assets | +/- |
| Inflation (INFLN) | Annual Inflation Rate divided by 100 | +/- |
| Insider Ownership (OWN1) | Management shareholding/Total shares | +/- |
| Institutional Ownership (OWN5) | Total shares owned by Institutional Investors/Total Shares | +/- |
| Firm size (SIZE2) | Log of Total Assets | +/- |
| Money Supply (MSP) | M2 over GDP, as a decimal | +/- |
| Earnings per Share (EPS) | Earnings over total shares outstanding | + |
| Taxation (TP) | Tax paid/Operating income | +/- |

## 3.3. Sources of Panel Data and Sample Size

The study covered a 17-year period as follows: period of inflation (2000 – 2008) and dollarization (2009-2016). Data was obtained from financial statements on company websites and the African Financials website. Data on macro-economic variables was obtained from World Bank (2017) and RBZ reports. There were 63 firms listed on the ZSE as at 31 December 2018. The study excludes three (3) companies under suspension, six (6) banking institutions and six (6) insurance firms. There was a total of eighteen (18) firms with incomplete data sets and some of them were registered after the year 2000. This leaves a total of thirty (30) firms giving a total of 510 firm years. Comparatively, Kowerski and Wypych (2016) employed 71 firms with 307 firm years.

# 4. Results and Discussion

## 4.1. Descriptive Statistics and Diagnostic Tests

The problem of multicollinearity was checked using Pearson correlation matrix. Correlation coefficients were mostly less than 0.5 which implies that there was no serious problem of multicollinearity between any pair of variables. Thus, all the variables could be used in the same model without giving spurious results (Table withheld). Findings further showed that fixed effectsare not redundant for all the three sample periods. Random effects were correlated with explanatory variables. This implies that the FE model would be useful in the analysis. Furthermore, the study conducted unit tests at 5% level of significance. Results showed that all variables were stationary at levels (Table 4.1).

**Table 4.1: Unit Root Tests**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Levels** | | | **1st difference** | | |
|  | Levin, Lin & Chu | Im, Pesaran & Shin | Levin, Lin & Chu | | Im, Pesaran & Shin |
| **Variable** | Statistic | Statistic | Statistic | | Statistic |
| FLEV6 | -3.95\*\*\* | -5.33\*\*\* | -14.00\*\*\* | | -14.68\*\*\* |
| INV1 | -3.66\*\*\* | -4.31\*\*\* | -6.67\*\*\* | | -11.69\*\*\* |
| PR1 | -7.35\*\*\* | -6.70\*\*\* | -13.64\*\*\* | | -13.39\*\*\* |
| PR2 | -8.16\*\*\* | -7.01\*\*\* | -14.56\*\*\* | | -14.33\*\*\* |
| DYD | -6.71\*\*\* | -6.34\*\*\* | -11.56\*\*\* | | -12.14\*\*\* |
| INFLN | -11.60\*\*\* | -6.72\*\*\* | -18.59\*\*\* | | -13.63\*\*\* |
| OWN1 | -1.57\* | -1.71\*\* | -9.31\*\*\* | | -10.12\*\*\* |
| OWN5 | -5.51\*\*\* | -3.65\*\*\* | -8.25\*\*\* | | -9.38\*\*\* |
| SIZE2 | -3.86\*\*\* | -3.02\*\*\* | -13.86\*\*\* | | -13.59\*\*\* |
| MSP | -16.02\*\*\* | -11.64\*\*\* | -62.39\*\*\* | | -47.75\*\*\* |
| EPS | -6.93\*\*\* | -4.59\*\*\* | -16.62\*\*\* | | -14.77\*\*\* |
| TP | -5.82\*\*\* | -5.89\*\*\* | -13.88\*\*\* | | -14.89\*\*\* |
| FG | -12.00\*\*\* | -11.67\*\*\* | -16.19\*\*\* | | -18.89\*\*\* |

*\*\*\* significant at 1%; \*\* significant at 5%; \*significant at 10%*

## 4.2. Evidence on the Determinants of Dividend Policy

Firstly, the study estimated the Lintner model to examine its predictive power. We then extended this model by incorporating more variables specific to the Zimbabwean context. Estimations were done for the period of hyperinflation (2000-2008) and dollarization (2009-2016) and for the full period (2000-2016). The models were estimated using GMM and FE models. Squared variables for ownership structure (Morck et al 1988, McConnel and Servaes, 1990), earnings per share and firm size were used to test for non-linearity in the model. Secondly, the study also specified general panel data models to examine the determinants of dividend policy. These allowed us to select the best measure of dividend policy.

### 4.2.1. The Lintner Model

The model is specified as follows:

, (4.1)

Where

Dividend per share (DPS) was represented by PR1 and EPS is earnings per share. The error term is composed of firm specific component, , time specific component, and a component varying across firms and across time, . The parameters are represented by and .

The Wald statistic for the joint significance of regressors was significant at 1%. This implies the models have predictive power to explain the level of dividend behaviour. The J-Statistic for all the models estimated by GMM were close to zero, thus all the models were good. P-values were not reported since J-stats were all close to zero. The problem of heteroscedasticity was dealt with using robust standard errors in all estimations. Generally, the results (Table 4.2) are consistent with the Linter model. The constant is positive and significantly different from zero which shows that the hypothesis that firm managers are reluctant to reduce dividends is rejected at 1% level. The level of dividend payout and earnings per share are positive and significantly different from zero as expected. Dividend payments do not follow a random walk as shown by the positive and significant co-efficient of dividends in the past period. Under hyperinflation and using the pooled sample, current earnings and previous dividends, individually, have a significant effect on dividend policy as suggested by Linter. The adjustment factors for all the models were at least 0.50 which shows that dividend payments were not smoothened. By considering the values for R2 the best model was estimated using FE. Under dollarization the Lintner model was not applicable. The coefficient of lagged DPS variable was negative and insignificant. Firms may not rely on past dividends to predict future dividends under dollarization. In this case firms may be paying dividend only when there is residual income. Results show that the adjustment factors were at least 0.74 while the estimated payout ratios were around 0.11 for the three estimations periods. Thus, the adjustment to the targeted payout ratio, by firms, is not instant.

**Table 4.2: The Lintner Model**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Period | 2000-2016 | | 2000-2008 | | 2009-2016 | |
| Variable | FE | GMM | FE | GMM | FE | GMM |
| DPSit-1 | 0.2512\*\*\* | 0.4628\*\*\* | 0.1822\*\*\* | 0.496\*\*\* | -0.0469 | 0.4161\*\*\* |
| EPSit | 0.093\*\*\* | 0.1933\*\* | 0.0992\*\*\* | 0.2100\*\*\* | 0.1157\*\*\* | 0.205\*\*\* |
| C | 0.0147\*\*\* | 0.0018\*\*\* | 0.0171\*\*\* | 0.0010\*\*\* | 0.0200\*\*\* | 0.0024\*\*\* |
| Target PR (ρ=β/δ) | 0.1242 | 0.3598 | 0.1213 | 0.4167 | 0.1105 | 0.3511 |
| Adj Factor (δ = 1-α) | 0.7488 | 0.5372 | 0.8178 | 0.504 | 1.047 | 0.5839 |
| R2 | 0.7645 | 0.6196 | 0.856 | 0.7508 | 0.8131 | 0.5983 |
| Adj R2 | 0.7481 | 0.6180 | 0.8346 | 0.7487 | 0.785 | 0.5949 |
| F-Test | 46.69\*\*\* | - | 39.91\*\*\* | - | 28.92\*\*\* | - |
| DW | 2.11 | 2.24 | 2.18 | 2.22 | 1.84 | 2.40 |
| J-Stats |  | 3.88E-29 |  | 8.12e-28 |  | 5.12E-28 |
| Observations | 478 | 448 | 240 | 240 | 238 | 238 |
| Wald Joint | 376.73\*\*\* | | 374.79\*\*\* | | 150.89\*\*\* | |

*\*\*\* significant at 1%; \*\* significant at 5%; \*significant at 10%, \*significant at 10%, p-values not reported since J-stats are close to zero*

The extended Lintner model is non-linear as it incorporated squared variables for firm size, insider ownership and earnings per share. The model was specified as follows:

(4.2)

Results (Table 4.3) for the specific FE models that were selected based on the number of significant parameters, value of R2 and the diagnostic test applied earlier. The best model was chosen from each sample period and the values of R2 were ranging from 75% and 82%. The models were considered good as reflected by the statistically significant values for F-tests. The adjustment factors were at least 0.88 and the payout ratios are at ranged from 0.07 to 0.20. The constant was negative and significant using the pooled sample. This was evidence that estimation by Lintner did not apply when using the pooled sample. However, the constant was positive and significant in the two subsamples. Thus, firms do not adjust instantly to the desired payout level as suggested by Khan et al (2013). The differences observed between the subsamples and pooled sample could have been due to different behaviors by firm managers under the two dispensations. This would demand different policy responses considering the different market conditions prevailing under each sub period.

The main contribution from this discussion is the modification the Lintner model and specifying it as a non-linear model. This is a contribution, not only in the context of emerging markets, to literature on corporate dividend policy. More so, the results contribute to the understanding of the Lintner model in the context of hyperinflation and dollarization. The study shows that past dividends are important in predicting future dividends when using the pooled sample. These findings are consistent with previous studies (Khan et al, 2013, Hosain, 2016) which showed that previous dividends have a significant effect on future dividends. Previous dividends were not important in explaining the dividend policy under dollarization and hyperinflation. These findings are not consistent with the Lintner model as indicated by the insignificant coefficient of past dividends. This suggests that firms were using the residual approach that requires them to pay dividends by considering the remaining equity after meeting capital requirements. However, the study shows that earnings per share have a positive effect on future dividends. The size of the EPS coefficient, was significant at 1%, varied among the three periods of estimations being 0.1813 (pooled sample), 0.1257 (hyperinflation) and 0.0672 (dollarization). The differences could be explained by the fact that under hyperinflation firms had more nominal earnings than under dollarization and hence they would afford to payout more dividends. Furthermore, the study shows that earnings per share have a non-linear relationship with dividend policy under the period of hyperinflation and using the pooled sample. This is reflected by the negative coefficient of the squared earnings variable. This suggests that firm managers would exercise their power to increase dividend payouts up to a level of earnings per share of 21.18 cents (2000-2016) and 21.57 cents (2000-2008). After this level, the level of dividend payout would fall which may be explained by firm managers’ actions to direct residual earnings to other uses like investment expenditure. The average earnings per share are still at 4.10 cents which shows that earnings are still an important consideration on the level of dividends payouts.

Results show that firm growth (FG) has a negative and significant effect on dividend policy. These findings are consistent with previous studies (Arshad et al, 2013, Michaely and Roberts, 2012, Farinha, 2003, Al-Najjar and Kilincarslan, 2018) which suggest that firms were more concerned with their investment opportunities than on paying of dividends. The more sales grow then the less firms were willing to pay dividends. Firms were more willing to take up investment opportunities which are captured by firm growth. These findings are also consistent with the pecking order hypothesis and transactions cost theory. Therefore, firm managers would desire to allocate cheaper internal finance to exploit growth opportunities. Firm managers in Zimbabwe found it cheaper to reinvest using available free cash flows than to rely on outside funding, hence a cut in dividends.

Financial leverage had a significant and positive effect on dividend policy during the period of dollarization. Most of the studies predicted that leverage has a negative effect since dividend payments and debt may be used interchangeably as alternative forms of firm control. The trade-off theory also argues that highly leverage firms resort to the use of internal sources of finance to make debt repayments as such they avoid the payment of dividends (Khan et al, 2013). As a point of departure, results are, however, consistent with Arshad et al (2013) who showed that debt has a positive relationship with dividend policy. Easterbrook (1984) argued that firms can afford to simultaneously pay out dividends and raise new funds in the capital market where monitoring costs for managers are low. Under hyperinflation, leverage had a negative and insignificant effect on dividend policy. These results could be attributed to the fact that debt repayments were eroded, and firms were making profits from arbitrage activities as opposed to production during this period. Thus, they could afford to pay dividends with no regard to debt levels. The other explanation could be that during this period firms did not take much of long-term debt to avoid being exposed to long term debt obligations hence facing the risk of bankruptcy. This is consistent with results by Alzomaia and Al-Khadhiri (2013) who argued that debt has no effect on dividend policy. For Zimbabwe, this can further be explained by lower debt-equity ratios during that period. The value of equity was increasing, more than changes in debt, in line with inflationary trends since the equities would act as an inflation hedge.

The agency theory posits that ownership structure is important in explaining dividend policy for firms. It shows that firms with more insider and institutional ownership have low agency costs. Such firms are expected to have low dividends payouts and they signal firm value by paying high dividends. As a point of departure from the agency theory, this study finds that ownership structure had a positive effect on dividend policy. This is evidence of the presence of managerial entrenchment within the Zimbabwe market which could be explained by weak monitoring by boards and few cases of managers being fired for non-performance. The finding is consistent with previous studies (Ahmad and Javid, 2009, Zameer et al, 2013) which showed that firms with more inside ownership use dividends to signal firm value. Results agree with the proposition that firms with more inside control regard the consequences of cuts in dividends and omissions to be ineffective. Tightly controlled firms pay more dividends as they respond to temporary fluctuations in earnings than firms with diffused ownership. Principal shareholders would require more dividends to reduce agency costs by mopping up excess liquidity (Easterbrook, 1984, Shleifer and Vishny, 1986). Most importantly, the study shows that dividend payout and inside ownership have a non-linear relationship. Dividend payout increases with an increase in inside ownership up to a level of 79.79% and declines thereafter. None of the firms have reached this level of ownership under the period of dollarization. Using the full sample, the turning point is at 40% of inside ownership. These critical points show the decline in levels of managerial entrenchment. This study suggests that inside ownership is still an important consideration regarding payment of dividend in the current environment.

Institutional ownership had a negative effect in dividend payout ratio under hyperinflation and a positive effect under dollarization. The result under dollarization is consistent with proposition (Allen et al, 2000, Bozec et al, 2010) that institutional investors have an impact over dividend policy by influencing management to pay more dividends to reduce agency costs. The negative effect, found under hyperinflation, is consistent with propositions (Mehrani et al, 2011) that institutional shareholders may use their influence over managers to pay low dividends and instead use funds for other purposes. However, such practices are applicable for a short time otherwise the relationship may turn out to be positive where ownership becomes more concentrated. In the context of this study, hyperinflation eroded cash payments for dividends by Zimbabwe firms and investors would rather prefer to be rewarded by other means like getting more shares which maintain their value. These results were also consistent with those by Thanatawee (2014) and Huda and Abdullah (2013).

Firm size had no effect on dividend payout ratio within the two subsamples. Using the pooled sample, firm size has a positive and significant effect on dividend policy which shows that larger firms are paying out more dividends than smaller ones. This is consistent with empirical literature (Faff et al, 2016, Al-Najjar and Kilincarslan, 2018 and Uwuigbe, 2013) which developed the proposition that firms use large payouts as a signaling device that they are doing well. The explanation for Zimbabwe could be that large firms endeavored to pay more dividends as a way of retaining investors. Firms enjoyed more cash flows from arbitrage opportunities as such they would afford to pay more dividends. Furthermore, firm size had a non-linear effect on dividend payout which is evidenced by a negative and significant coefficient of the squared variable. The regression model showed a curvilinear relationship between firm size and dividend payout in which firm size increases at first and then decreases as the log of assets goes up.

Taxation coefficient was positive and significant in both sub sample periods which is contrary to most findings in literature. This suggests that Zimbabwe firms were able to payout more dividends even as they paid tax. This is consistent with proposition (Amidu and Abor, 2006, Gill et al, 2010, Rehman and Takumi, 2012) that firms with an increasing trend in tax liability have a high preference for paying out more dividends. In the case of Zimbabwe, it is possible that firms were having income from alternative sources to compensate for dividend payments. Another explanation could be that firm managers may have selected their dividend policy and they would continue to honour such payments to appease investors. Again, in the case of Zimbabwe, the market is dominated by anxiety as such payment of dividends help in investor retention. Firms managed to take advantage of debt financing, as opposed to after tax profits, to maximize their value while paying out dividends. This is consistent with theoretical arguments by Ince and Owers (2012).

The investment variable was insignificant during the hyperinflation period and was therefore dropped from the analysis. The study shows that, under dollarization, investment and dividend decisions have a positive association which is consistent with simultaneous dividend theory (Lahiri and Chakraborty, 2014). The study suggests that dividend payouts were increasing as firms increased investment expenditure. This is possible where firms do not rely on internal sources of finance for investment. In the case of Zimbabwe, firms were able to access funding from debt considering the advanced financial sector. This is further explained by the fact that financial constraints seemed to be insignificant in relation to dividend policy. Hence, the variable capturing financing constraints was dropped from the analysis because it was insignificant. The other explanation consistent with the Zimbabwe market, given by Franc-Dabrowska (2009), is that most firms that were paying dividends may have been at their maturity stage as such they had enough assets for long term investment and for dividend payouts. Furthermore, Kato et al (2002) proposed that dividend increasing firms significantly increase their investment activities as they have higher earnings and lower debt ratios. Firms in Zimbabwe have debt ratios below 50% level.

The inflation variable and money supply variables were employed to control for hyperinflation and dollarization. As expected inflation had a negative effect under hyperinflation while money supply had no effect throughout the review period.

**Table 4.3: Extended Linter Models for three sub-periods**

|  |  |  |  |
| --- | --- | --- | --- |
| Period | 2000-2016 | 2000-2008 | 2009-2016 |
| Variable /Model | FE | FE | FE |
| C | -0.2518\*\* | 0.01767\*\*\* | 0.0100\*\*\* |
| DPSi(t-1) | 0.1226\*\*\* | 0.0320 | -0.0570 |
| FG | -0.0012\*\* | -0.0023\*\*\* | -0.0010\*\* |
| FLEV6 | -0.0006 | -0.0005 | 0.0014\* |
| INFLN | -1.80E-10 | -1.08E-09\*\*\* | 0.0220 |
| OWN1 | 0.0540\*\*\* | 0.0892\*\*\* | 0.0538\*\*\* |
| OWN1SQD | -0.0675\*\* | -0.0846 | -0.0338\*\* |
| SIZE2 | 0.0306\*\* | - | - |
| SIZE2SQD | -0.0009\*\* | - | - |
| MSP | 0.0011 | 0.00029 | 0.0002 |
| EPS | 0.1813\*\*\* | 0.1257\*\*\* | 0.0672\*\* |
| EPSSQD | -0.4279\*\*\* | -0.2914\*\* | - |
| TP | 0.0076\*\* | 0.0203\*\*\* | 0.0069\*\*\* |
| INV1 | 0.0020\* | - | 0.0040\*\*\* |
| OWN5 | 0.0004 | -0.0046\* | 0.0089\*\*\* |
| OWN5SQD | 0.0020\*\* | - | - |
| Adj Factor (δ = 1-α) | 0.8874 | 0.968 | 1.057 |
| Target PR (ρ=β/δ) | 0.2043 | 0.1299 | 0.0710 |
| R2 | 0.75 | 0.82 | 0.82 |
| Adj R2 | 0.73 | 0.79 | 0.79 |
| F-Test | 29.83\*\*\* | 23.38\*\*\* | 23.10\*\*\* |
| DW | 2.03 | 2.28 | 2.09 |
| Observations | 478 | 240 | 238 |

*\*\*\* significant at 1%; \*\* significant at 5%; \*significant at 10%*

### 4.2.2. Results Using the Specific Dividend Models

Firstly, we estimated model 3.1 in each of the sample period for each of the three measures of dividend policy (PR1, PR2, DYD) using the two estimation methods (GMM, FE). Secondly, we selected the best model for each dependent variable leaving us with three models under each period. Thirdly, we selected a best model, under each period, after comparing the three models within each period and it formed the basis of discussion of results. The selection criteria were discussed under models by Lintner. Literature lacked consensus on the best measure of dividend policy and hence the use of three measures in this study. This study contributed by showing that PR1 is the best proxy for dividend policy in the context of Zimbabwe. More so, PR1 has been widely used in literature and in pursuant of this, the study also adopted the results based on the same proxy under dollarization[[5]](#footnote-5) though GMM produced better results. Generally, the results (Table 4.4) were the same as those found using the Linter model. The implications have been discussed before and are not provided in this section to minimize repetitions. We discuss results that showed some differences from those given using the model by Lintner.

Leverage had a negative effect on dividend policy under hyperinflation as expected from theory. Firms had no access to the debt market due to limited financing options and hence resorted to internal finance. Firms were faced with high debt servicing costs plus fall in cash flows which reduced the funds available for dividends which is consistent with some previous studies (Edmund, 2018, King’wara, 2015). Results showed a non-linear relationship between insider ownership and dividend pay-out using the entire sample and under hyperinflation. This confirms the presence of managerial entrenchment. Again, firm size had a non-linear effect on dividend payout using the pooled sample and no effect under dollarization. Under hyperinflation large firms were paying fewer dividends which is consistent with King’wara (2015), Farinha (2003) and Bushra and Mirza (2015). This is explained by the proposition that larger firms were retaining cash to repay their debt obligations.

Results for Taxation, investment expenditure and earnings per share are like those found using Lintner. Differences are with respect to size of coefficients. The study showed a non-linear effect of institutional shareholding. The entire sample (2000-2016) showed that the negative effect of institutional ownership is dominant until a threshold[[6]](#footnote-6) of 68.52% of ownership has been reached. Beyond this level, the growth opportunities for firms would have stabilized and firms would manage to pay extra cash dividends. However, under dollarization institutional share ownership has a positive effect on dividend payouts up to a threshold of 84.38%. This is attributable to the change in market sentiments as shareholders are expecting the economy to recover due to the stability that has been brought by the multicurrency regime.

**Table 4.4: Selected Dividend Models**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 2000-2016 | 2000-2008 | 2009-2016 | |
| Dependent Var. | PR1 (FE) | PR1 (FE) | PR1 (FE) | PR2 (GMM) |
| C | -0.1825 | 0.0663\*\*\* | -0.309 | 0.8732\*\*\* |
| FG | -0.0011\*\* | -0.0023\*\*\* | -0.0013\*\*\* | -0.0157 |
| FLEV6 | -0.0028 | -0.0015\* |  |  |
| INFLN |  | -7.50E-10\* |  | 4.2573\*\*\* |
| OWN1 | 0.0694\*\*\* | 0.1124\*\*\* | 0.0363\*\*\* | 1.5449\*\*\* |
| OWN1SQD | -0.0885\*\*\* | -0.1205\*\* |  | -3.5037\*\*\* |
| SIZE2 | 0.0241\*\* | -0.0127\*\* | 0.0379 |  |
| SIZE2SQD | -0.0017\*\* |  | -0.0011 |  |
| MSP | - | -0.0017 | 0.0018 | -1.3204\*\*\* |
| EPS | 0.1832\*\*\* | 0.1633\*\*\* | 0.0737\* | -0.5085\*\* |
| EPSSQD | -0.4288\*\*\* | -0.4090\*\*\* | -0.1319 |  |
| TP | 0.0081\*\*\* | 0.0170\*\*\* | 0.0013 | 1.0140\*\*\* |
| INV1 | 0.0025\*\* | 0.0021 | 0.0024 | 0.0676\*\* |
| OWN5 | -0.0037\* | -0.0040\* | 0.0108\*\*\* | -0.1607\* |
| OWN5SQD | 0.0027\*\*\* | - | -0.0064\* | 0.0843\*\*\* |
| R2 | 0.753 | 0.783 | 0.8316 | 0.2252 |
| Adj R2 | 0.731 | 0.744 | 0.7976 | 0.2912 |
| F-Test | 34.75\*\*\* | 20.06\*\*\* | 24.46\*\*\* |  |
| DW | 1.76 | 2.01 | 2.07 | 1.8 |
| Observations | 509 | 270 | 239 | 239 |
| J-stats |  |  |  | 2.134  [0.711] |

*\*\*\* significant at 1%; \*\* significant at 5%; \*significant at 10%, p-value in (.)*

# 5. Summary and Conclusions

The study contributed to the discussions on dividend policy by focusing on an emerging market in the context of hyperinflation and dollarization. The aim was to delineate the main determinants of dividend policy. Furthermore, the study examined the effect of investment and financial decisions on dividend policy. This was achieved using FE model and employing an extended version of the model by Lintner.

The model by Lintner was applicable under hyperinflation as firms, presumably, followed the stability approach to dividends to reduce investor uncertainty. There is no instant adjustment, by firms, to the target dividend policy in both subsamples. However, the extended version of the Lintner model showed that previous dividends are not important in explaining the dividend behaviour in both periods. This shows that, by extending the model, the views by Lintner may be challenged considering findings under the two sample periods. Furthermore, the model by Lintner was specified as a non-linear model. A non-linear relationship was found between dividend policy and inside ownership throughout the period. It had a non-linear relationship with earnings per share under hyperinflation and with firm size when using the pooled sample. Financing and investment decisions were important in explaining dividend policy under dollarization and had no effect under hyperinflation. The effect of explanatory variables was sensitive to the sample period, method of estimation and the measure of the dependent variable employed.

Empirical results, using the selected models, showed that under hyperinflation, dividend policy was negatively affected by firm growth, leverage, inflation, firm size and institutional ownership. Variables like money supply and investment expenditure had no effect while taxation had a positive effect on dividend policy. Earnings per share and inside ownership had a non-linear relationship with dividend policy. Under dollarization, dividend policy was positively affected by inflation, taxation and investment decisions while money supply and earnings per share had a negative effect. Dividend policy had a non-linear relationship with both ownership variables.

Findings provide a firm foundation for understanding dividend policy in emerging markets under unique conditions. Considering the level of uncertainty in the current environment, firms may need to develop policies that have both short and long term focus. In view of this, stable dividend policies are ideal for firms that focus on investor retention and provision of constant income. This idea is consistent with bird in the hand theory. The presence of informational asymmetry requires firms to rely on internally generated finance. This would require firms to have a long-term focus by fixing their target debt/equity ratios and paying dividends using residual income. Policies that focus on minimizing informational inefficiencies would be desirable for the Zimbabwean market. Improved access to debt markets by high growth firms and assist them to continue paying dividends in the face of managerial entrenchment and high growth opportunities.

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1. Corresponding Author: Department of Accounting & Finance, Botho University; [smint50000@gmail.com](mailto:smint50000@gmail.com) [↑](#footnote-ref-1)
2. Professor, Department of Economics, University of Botswana, [okurutf@mopipi.ub.bw](mailto:okurutf@mopipi.ub.bw) [↑](#footnote-ref-2)
3. Graduate Studies Coordinator, Department of Economics, University of Botswana, [ntsosamm@ub.ac.bw](mailto:ntsosamm@ub.ac.bw) [↑](#footnote-ref-3)
4. Professor, Department of Economics, University of Botswana, [sinhan@mopipi.ub.bw](mailto:sinhan@mopipi.ub.bw) [↑](#footnote-ref-4)
5. Results withheld and can be provided by authors upon request [↑](#footnote-ref-5)
6. Turning point = 0.0037/(2x0.0027) = 0.6852 [↑](#footnote-ref-6)