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The Significance of Retained-Earnings-based Firm Valuation Model During Military Regime Era in Pakistan

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Retained earnings; Firm value; Shareholders' wealth; Investment; Reinvestment; Listed manufacturing firms; Pervez Musharraf era.

Abstract

An empirical evaluation of the adopted but a modified version of the firm valuation equation has been conducted to test the retained earnings-based firm valuation model including retained earnings, firm value, and shareholders' wealth as variables. The impact of retained earnings on firm value and shareholders' wealth as well as firm value on shareholders' wealth has been evaluated by using primary data collected randomly from 85 listed manufacturing firms using a questionnaire. The alpha score of .866 has been generated relating constructs of the research instrument. Furthermore, factor analysis and ordinary least squares regression has been used to test study hypotheses. Study findings suggested that retained earnings have played a vital role in the expansion activities and benefited sample firms in achieving desired growth. Moreover, the value of sample firms enhanced and shareholders' wealth maximized due to investment and reinvestment of retained earnings in value-enhancing projects. Thus, results have applauded the Musharraf government and concomitantly validated the strength of retained earnings-based firm valuation model.

Disciplinary: Management Science (Corporate Finance & Investment|), Mathematical & Econometric Modeling & Analysis.

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1 Introduction

General Pervez Musharraf, the Chief of Army Staff (COAS) toppled the elected Government of the Prime Minister Mian Muhammad Nawaz Sharif on 12 October 1999 and took charge of the federation of Pakistan as President after the national general elections which were held on 12 October 2002. Consequently, according to Indurthy (2004), the Bush administration had selected and embraced General Musharraf and supported his regime with huge economic largesse despite the fact that the aftermath was unfavorable and unpopular among the masses, "the people". This dramatic change of leadership, the military form of the elected government in Pakistan calls for formal financial analyses of investment and reinvestment activities of manufacturing companies listed at Pakistan Stock Exchange (PSE) (earlier was Karachi Stock Exchange) during this period. The era of General Pervez Musharraf's regime was during 1999-2008 and after the national elections of 2008, a new democratic government of the Pakistan Peoples Party was formulated and democratic norms of governance were revived in the country. Therefore, in this regard, it's imperative to test empirically the significance of retained earnings (i.e., investment and reinvestment of retained capital by listed firms) that could enhance the value or otherwise in the economy. Here, emphasis is on the evaluation of the productive use of 77% retained capital by listed manufacturing firms in Pakistan. Evidently, the problem of low dividend payout by firms in Pakistan reported by Mehar (2007) indicates that in Pakistan payment of dividends equals 23% of the incremental profits of the firms. It shows that 77% of incremental profits have been retained by the firms in the country. Hence the formulated research question of the study is; what is the significance and effect of retained earnings on the value of the listed manufacturing firms; and how retained earnings are affecting shareholders' wealth when firms are retaining a higher level of funds for investment and reinvestment activities in Pakistan?

Therefore, to evaluate the significance of retained earnings-based firm valuation model in Pakistan, the firm valuation equation (under no brokerage commission) derived by Sethi and Taksar (2002) has been adopted and modified to address the optimal financing problem of infinite horizon corporation. In this study, the impact of retained earnings on firm value and further on the impact of firm value on shareholders' wealth has empirically been examined in the non-contrived business environment of Pakistan. The research problem evaluated in this study cover General Pervez Musharraf's era of government in Pakistan. The major findings of the study suggest that retained earnings-based firm valuation model significantly explained the variance created by retained earnings on the firm value and shareholders' wealth. It means that investment and reinvestment activities undertaken during the era 2000 to 2009 by the sample firms have maximized the value of the firms as well as the wealth of the shareholders. Thus, investment and reinvestment of 77% of retained earnings by the sample firms in Pakistan facilitated them in achieving the wealth maximization goal of the shareholders during the regime of General Pervez Musharraf.

1 Literature Review

1.1 Retention Policy (Retained Earnings)

Rozeff (1982) indicated that fast-growing firms reduce their dependence on external equity financing by paying lower dividends to the shareholders and specified growth as negatively related to dividend payout (Donati, 2016). Earlier, Myers and Majluf (1984) formulated the Pecking Order Theory for capital structure and categorized sources of financing used by the firms that prefer retained earnings as their main source of funds for investment. The second preference was debt and the third was external equity financing by the firm. Sethi and Taksar (2002) attempted to solve the optimal financing problem of an infinite horizon corporation and their work comprehensively addressed the value function of the firm by taking into account retained earnings and external equity as sources of financing and thus solved the optimal financing problem. Furthermore, Jones and Sharma (2001) examined the association of investment opportunity set and corporate policy of listed firms in Australia and found a negative association of debt to equity ratio to dividend yield relating the investment opportunity set seeking higher growth had been endorsed by Bambang, et al. (2019). Accordingly, Bhattacharyya et al. (2008) found a negative association between dividend payout and earnings retention and a positive association between earnings retention (retained earnings) and capital expenditure, much of the studies supported it, including the studies of (Masso and Merikull, 2011; Alves, 2018; Ball, et al. 2020). Moreover, Chen (2008) concluded that under an effective corporate governance system new US economy firms retained higher levels of cash to fund available growth opportunities.

1.2 Firm Value

Gentry et al. (2003) introduced a comprehensive integrated valuation model known as a firm's intrinsic value estimation system which was useful in forecasting a firm's value and could access the financial health of the firm by using the available financial statements data of the firms. Consequently, Trundle (2005) argued that corporate real estate operational strategy should be formulated in order to maximize the market value of the firm where the corporate real estate appraisal process needs to be divided into investment and financing decisions (Wang and Choi, 2015). Furthermore, Nappi et al. (2009) reported an increased amount of corporate real estate assets ownership by French listed firms which had used 'EVA' and 'MVA' methodologies. Factually, the socially responsible investments had resulted in significantly enhanced firm value due to responsible capital allocation by global institutions which were governed by vibrant shareholders (Martínez et al., 2013; Lee et al., 2015; Dogru and Sirakaya-Turk, 2017; Ball et al. (2020); Zhang and Zi, 2021).

1.3 Shareholders' Wealth

La-Porta et al. (2000) stated that the model of dividend policy established based on an effective legal rights protection system for the minority shareholders ensured higher dividend payout. Subsequently, Jensen (2001) criticized stakeholder theory as well as the balance scorecard

approach of firm performance measurement because both of these create distortions in valuation mechanism and favor self-interested managers to use firm's resources for empire-building on the cost of firm and shareholders' value maximization goal. However, McCarthy (2004) linked shareholder wealth maximization with effective and efficient use of value management methods by the firm management that could eliminate conflicts of interest between principal and agent. Accordingly, Lindholm et al. (2006) formulated a 'Corporate Real Estate Management (CREM)' model that added value to a non-real estate firm's core business through a strategic management framework that enhanced firm value and maximized shareholders' wealth. Conversely, Baker et al. (2007) surveyed dividend policies of Canadian firms and identified the relevance of dividend policy toward value creation of the firm as well as maximization of shareholders wealth (Bosch-Badia et al., 2014; Baldwin and Alhalboni, 2020; Wei and Zhou, 2020).

2 Research Model Development

We have developed a research model based on the work of Sethi and Taksar (2002) who had mathematically solved the optimal financing problem of an infinite horizon corporation by categorizing firms' earnings levels. The mathematical equation derived by Sethi and Taksar under no brokerage cost condition took the form

$$v_1(x) = \frac{r(x^*)}{\rho} + x - x^* \qquad (1),$$

where $v_1(x)$ represents the total value of the firm; $\frac{r(x^*)}{\rho}$ represents capitalized value of the stream of firm's earnings; $(x - x^*)$ represents dividend payment by the firm; x^* represents firm assets (capital) at an optimal level; x represents firm's initial assets at the start level; $r(x^*)$ represent a stream of a firm's income over a certain period in time, and; ρ represent the cost of capital.

The reduced form of Equation (1) represents a condition in which a firm is at or below the threshold earnings level and therefore retains all of its earnings. The reduced form of Equation (1) is

$$v_1(x) = \frac{r(x^*)}{\rho} + x \qquad (2).$$

Now, solving the right-hand side of Equation (2), we get

$$\frac{r(x^*)}{\rho} + x \Longrightarrow \left[\frac{r(x^*)}{\rho}\right] + [x],$$

where the following conditions are also applicable and hold true in the case of no dividend payout condition, which is

$$\frac{r(x^*)}{\rho} > 0 \; [for \; r(x^*) = I_1, I_2, I_3, I_4, \ldots\ldots\ldots, I_n \,].$$

And, $\rho < r_g$ $[where; g = growth\ rate\ of\ return\ for\ total\ earnings\ stream\ of\ the\ firm]$

Here, I represent an investment of the firm in a project; r represent return function for the current level of firm's assets (x^*); ρ represent the cost of capital or required rate of return desired by the investor; $\frac{r(x^*)}{\rho} > 0 \implies$ is considered as a continuous return function, whereas rest is constant.

Now, the right-hand side of the equation 'S' can be written as follows:

$$\left[\frac{r(x^*)}{\rho}\right] + [x] \Longrightarrow [Continuous\ capitalized\ stream\ of\ total\ earnings\ of\ the\ firm] + [Firm's\ funds\ or\ capital\ at\ initial\ or\ start\ level],$$

where $(x < x^*)$ holds true and represents that the initial or starting level of a firm's capital after a certain period like; a fiscal year is less than the threshold level of earnings. So, in this situation firms have no extra funds that can be paid out as dividends to the shareholders. Thus, the firm retains all of its earnings and also stretch-out for external financing from the financial institution or capital market to get back to the threshold level of the firm's assets (x^*). But, here We have ignored all means of external financing because leverage makes a firm a risky investment and also negatively affects the value of the firm. Now, Equation (2) takes the form

$$v_1(x) = [Continuous\ capitalized\ stream\ of\ total\ earnings] + [Retention\ of\ current\ and\ initial\ funds\ or\ capital\ by\ the\ firm]$$

$$\text{Or} \quad v_1(x) = [CSTE] + [Retained\ Earnings] + \underline{X}$$

$$\text{Or} \quad v_1(x) \Longrightarrow [Retained\ Earnings] + \underline{X} \qquad (3),$$

where $\underline{X}$ represents a vector of all the financial variables affecting the total value of the firm and here we have taken it as a control vector which creates no impact on the firm valuation equation. Therefore, (CSTE) represents a continuous capitalized stream of total earnings of the firm taken as fixed variable creating no impact on the equation because in time 't' firm's investment and reinvestment projects have not generated higher returns that once added to initial capital remain less than the threshold level of firm's funds. So, under this condition firms retain earnings that are available for investment activities.

Equation (2) has been further modified to Equation (3) including shareholders' wealth as an important variable. Figure 1 shows the diagram of retained earnings-based firm valuation model.

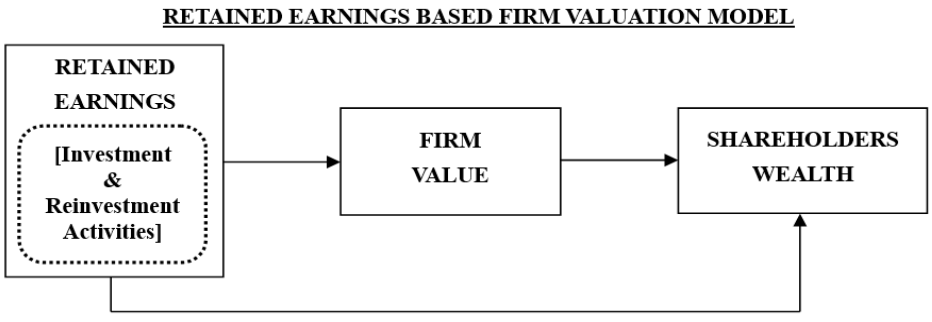

Figure 1: Research Model of the study

2.1 Econometric Model of the Study

The econometric model tested in this research study is as follows:

$$v_{(i,t)} = SW_{(i,t)} = \alpha_o + \beta_1[Retained\ Earnings]_{(i,t)} + \underline{X}_{(i,t)} + \varepsilon_{(i,t)} \quad (3),$$

where $v_{(i,t)}$ represents the value of the manufacturing listed firm i in the time t; '$SW_{(i,t)}$' represents shareholders wealth generated by the manufacturing listed firm i in the time t; 'α_o' is model constant term; $[Retained\ Earnings]_{(i,t)}$ represents earnings retained by the manufacturing listed firm i in the time t; β_1 represents the coefficient of retained earnings variable; $\underline{X}_{(i,t)}$ is a vector function that represents all the financial variables that are affecting the research model for a manufacturing listed firm i in the time t; and it is included in the model based on the work of Ho (2003), and; $\varepsilon_{(i,t)}$ is the model error term.

The statements of the hypotheses formulated for testing are

$\boldsymbol{H_1}$: Retained earnings are positively associated with a firm's performance, and Free Cash Flows (FCF) in the shape of retained earnings as the primary source of financing investments enhance the value of the firm (Ezeoha, 2008; Bambang et al., 2019; Bambang et al., 2019; Ball et al., 2020; Zhang and Zi, 2021).

$\boldsymbol{H_2}$: Retaining excess cash in the form of retained earnings maximizes the wealth of the firm's shareholders in the case when greater investment opportunities are available to the firm. Alternatively, if retention of earnings increases along with the increase of reinvestment of retained earnings, return on equity increases, and thus shareholders' objective of wealth maximization is achieved (Baum and Turner, 2004; Chen, 2008; Lee et al., 2015; Dogru and Sirakaya-Turk, 2017).

$\boldsymbol{H_3}$: Firm which follows shareholders' value maximization policy accumulates funds to be invested in profitable projects and higher value creating strategies successfully generate greater shareholder's wealth (Ghosh and Woolridge, 1989; Wei and Zhou, 2020).

2 Method

2.1 Sampling and Procedure

A total of 189 manufacturing firms listed at the Pakistan Stock Exchange (PSX) have been the study population. The sample of the study consist of 102 listed manufacturing firms selected randomly. The sample study period conformed to the regime of General Pervez Musharraf, the Chief of Army Staff (COAS) as discussed earlier. The sample firms belonged to eight industrial manufacturing sectors including; Chemicals, Pharma and Bio Tech, Electronic and Electrical Equipment, Food Producers, Construction and Materials, Automobile and Parts, Industrial Engineering, and Industrial Metals and Mining. An online website; randomizer.org has been used to generate a set of 102 unique numbers considered as a study sample. Additionally, Raosoft.com an online website has been used to calculate the sample size. The final sample comprised of 85 manufacturing listed firms which have been sourced to collect primary data by means of a research instrument consisting of 26 questions scaled from 1-5 (Likert type scale), where 1 represents

'strongly disagree' and 5 represents 'strongly agree'. The reliability of the tool calculated by Cronbach's Alpha of firm valuation model resulted in a score of 0.866. The validity of the tool after applying factor analysis showed factor loading of all the items values greater than 0.50 cut-off value.

3 Result and Discussion

3.1 Linear Ordinary Least Squares Regression Analysis Results

We have applied linear ordinary least squares (OLS) regression analysis on the collected data to generate results represented in Table 1.

Table 1: Linear Ordinary Least Squares Regression Analysis Results

Variables		Beta coefficients	Standard Error	t-value	p-value	F Statistics		*R*	R Square	Hypothesis
						F value	p-value			
First Regression Model										
IV-1	Retained Earnings	.672	.152	4.365	.001	19.054	.001*	.810	.656	H_1 Accepted
DV-1	Firm Value	.927	.626	1.482	.169					
Second Regression Model										
IV-1	Retained Earnings	.625	.187	3.339	.008	11.148	.008*	.726	.527	H_2 Accepted
DV-2	Shareholders Wealth	1.751	.671	2.607	.026					
Third Regression Model										
IV-1	Firm Value	.836	.253	3.308	.008	10.945	.008*	.723	.523	H_3 Accepted
DV-2	Shareholders Wealth	.340	.925	.367	.721					

*Significant at 0.05 ($p<0.05$)
Constants: DV-1, DV-2, DV-2, in first, second, and third regression respectively.

Table 1 reports regression analysis results in three steps. First, 'retained earnings' is regressed with 'firm value'. Second, 'retained earnings' is regressed with 'shareholders wealth'. And, third, 'firm value' is regressed with 'shareholders wealth'. In the first regression analysis, the value of Beta equals .672, for the second regression value of Beta equals .625 and for the third regression value of Beta equals .836 which revealed a positive impact of modeled variables. Moreover, it is confirmed by the high values of R (=.810) for first regression, R (=.726) for second regression, and R (=.723) for third regression that there are strong correlations between independent and dependent variables. Furthermore, the value of R square (=.656) for first regression, R square (=.527) for second regression, and R square (=.523) for third regression endorsed that 65.6% of the variance in firm value and 52.7% of the variance in shareholders wealth has been significantly explained by retained earnings. Also, shareholders' wealth is directly and positively linked with firm value. And, 52.3% of the variance in shareholders' wealth has been significantly explained by firm value. Additionally, F values of 19.054, 11.148, and 10.945 show the overall significance and strength of the models evaluated by regression analyses at (p-values < 0.05 level). The positive sign of Beta values indicates that if firm value and shareholders' wealth are to

be enhanced, it is necessary to retain earnings and invest them in positive NPV investment projects. Thus, hypotheses H_1, H_2 and H_3 are accepted and it is established that retained earnings have maximized the firm value as well as the wealth of the shareholders during the study period, representing that the sample firms have successfully utilized retained earnings for value-enhancing investment and reinvestment activities in Pakistan.

3.2 Results of Investment and Reinvestment of Retained Earnings

Tables 2 reports the values of N representing the number of responded firms. The mean represents an average of scale values ranging from 0-25%, 25-50%, 50-75%, 75-100%, and no reinvestment represents the percentage of scale values selected by the respondent. In 2000, 2006, 2007, 2008, and 2009, the majority of the respondents (45.45%) reinvested up to 25% of their firm's net income in value-enhancing projects. In 2001, 2002, 2003, 2004, and 2005, the majority of the respondents (36.36%) invested up to 25% of their firm's net income as compared to 27.27% of respondents who reinvested net income of their firm between 75 to 100%. No reinvestment activity was reported as 27.27% to 18.18% by the respondents in 2005, indicating an increase in reinvestments by the sample firms. The no reinvestment response is also reduced beyond 2006 when only 9.09% of the net income was retained by the firms and the rest was used for investment and reinvestment activities.

Table 2: Analysis results of the investment and reinvestment activities

Year		2000	2001	2002	2003	2004
N		12	12	12	12	12
Mean		2.82	3.09	3.00	3.00	3.00
Percent (%)	0 – 25 %	45.45 %	36.36 %	36.36 %	36.36 %	36.36 %
	25 – 50 %	0 %	0 %	0 %	0 %	0 %
	50 – 75 %	9.09 %	9.09 %	18.18 %	18.18 %	18.18 %
	75 – 100 %	18.18 %	27.27 %	18.18 %	18.18 %	18.18 %
	No reinvestment	27.27 %	27.27 %	27.27 %	27.27 %	27.27 %
Year		2005	2006	2007	2008	2009
N		12	12	12	12	12
Mean		2.73	2.64	2.64	2.55	2.55
Percent (%)	0 – 25 %	36.36 %	45.45 %	45.45 %	45.45 %	45.45 %
	25 – 50 %	9.09 %	0 %	0 %	9.09 %	9.09 %
	50 – 75 %	18.18 %	9.09 %	9.09 %	0 %	0 %
	75 – 100 %	18.18 %	36.36 %	36.36 %	36.36 %	36.36 %
	No reinvestment	18.18 %	9.09 %	9.09 %	9.09 %	9.09 %
The total mean score of investment and reinvestment of net income (2000 - 2009) = 2.802						

4 Conclusion

It is established based on the test of the retained earnings-based firm valuation model in Pakistan which represents the era of General Pervez Musharraf during 2000-2009, that higher retention of earnings by the listed manufacturing firms in Pakistan has significantly enhanced firm value due to investment and reinvestment activities. Consequently, shareholders' wealth has been maximized during 2000-2009. The investment and reinvestment activities generated out of 77%

retained earnings by 85 manufacturing firms. The analysis of three regression models endorsed the effective deployment of retained earnings-based firm valuation model in Pakistan. Therefore, results presented in this paper show the investment and reinvestment potential of manufacturing firms equipped to facilitate all upcoming Pakistani and Chinese government's industrial as well as economic growth initiatives and collaborations planned under China Pakistan Economic Corridor (CPEC) projects.

5 Availability of Data and Material

Data can be made available by contacting the corresponding author.

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