Application of Lintner's Dividend Model in Pakistan: Sector-Wise Analysis

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Abstract

Lintner has been a major contributor in the dividend policy debate. This paper verifies applicability of Lintner's Dividend Model relating to listed companies of manufacturing sector in Pakistan Stock Exchange. Furthermore, this study highlights the stability of dividend payout by performing sector-wise analysis. The study used panel data from 2004 to 2011. The effect of lagged dividend and current earning is examined on current dividend. Tobit regression model, as well as fixed/random effect model are employed for data analysis on the basis of Hausman test. Results indicate that dividend payout in different Pakistani firms of manufacturing sector is depending on lagged value of dividend and current earnings. While overall manufacturing sector firms of Pakistan have a consistent dividend payout dispensation, sector-wise adjustment speeds reveal that smoothening of dividend payout is not happening. It is suggested that profitability and growth of manufacturing sector firms in the long run should be the target for regulators and government policy makers in Pakistan which would in turn lead to good dividend payout to investors.

Keywords: Dividend policy, earning per share, profitability, Lintner model, manufacturing sector

Introduction

A dividend is a division of earnings of a company to its shareholders. Commonly cash dividends, stock dividend, and less commonly, property dividend is distributed to the shareholders. Dividend is offered to shareholders from financially sound companies. Dividend policy is a complicated and sensitive issue of corporate finance. Researchers, scholars, and academicians have examined this issue in different ways since the mid-1950s. Different factors and determinants of dividend policy have been investigated. Similarly, many theories and models have been developed and verified with the passage of time including the signaling hypothesis. Signaling theory/hypothesis suggests that a company's declaration of dividend payouts signals company's growth and acts as a sign that firm is going to have a financially secure future. In the advanced world, all these phases have been well researched and shareholders, policy makers and other related parties are well aware about the dynamics of the capital markets (Roomi, Chaudhry & Azeem, 2011). However, there is still need to understand factors related to dividend policy in developing countries like Pakistan.

Shareholders' wealth and long-term financing is affected by the dividend policy of the firm. In management's point of view, a higher rate of dividend offered to the shareholders may attract investors and increase the upcoming demand of firm's stock. This can occur when the investors consider the payout ratio of the preceding year as the

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relevant information concerning the well-being of the company (Ross, 1977). However, some companies may not offer dividend to the stockholders because their foremost goal is further growth based on reinvesting the firm's profit. According to Graham, Dodd & Tatham (1951) valuation of a firm depends on the dividend policy of the firm, and variations in dividend policy significantly affect the share price of a company. There is a positive effect on the share price in case stable dividends are offered by a firm. Miller & Modigliani (1961) while criticizing Graham, Dodd & Tatham (1951), argue that company's dividend policy is not relevant to its valuation. Lintner (1956) made a unique contribution to the dividend policy debate by developing a model for explanation of dividend policy behavior. He described recent earnings and past dividends as the most important determinants of dividend payout.

Taking Lintner (1956) model as the basis of their investigation, researchers (Wolmarans, 2003; Bodla, Pal, & Sura, 2007 and Ajmi & Abo-Hussain, 2011) have conducted studies on various industries of South Africa, India, and Saudi Arabia respectively. In Pakistan, Roomi, Chaudhry & Azeem (2011) debated on dividend payments and practices in non-financial sector of Pakistan by taking growth opportunity, size of the firm, market capitalization, and profitability as independent variables. Similarly, Ahmad & Javid (2009) discussed determinants of dividend policy in Pakistan with respect to non-financial sector, and discovered that current earnings more than past dividend effect fixation of dividend payments among listed companies. However, Ahmad & Javid (2009) result scan now be considered dated as their research was conducted before the global financial crisis of 2007 – 2008.

This research focuses on the application of Lintner's dividend model in Pakistan's manufacturing sector and uses data from 2004 to 2012 to cover post financial crisis era. Further, this study investigates dividend dynamics in Pakistan Stock Exchange which is one of the best performing exchanges in Asia, holding great promise for stimulating economic development in the country (Nishat & Irfan, 2004). Interest has also increased in analyzing the dividend behavior of Pakistani organizations since the implementation of Code of Corporate Governance by Securities and Exchange Commission of Pakistan (SECP) in 2002. The results of this study will be useful for assessing dividend policy layout at the firm level as well as in analyzing the dividend behavior at the national level. Further, any confirmation regarding dividend stability might offer further support to the signaling theory as it relates to dividend payout. Finally, by including non-dividend paying firms and applying Tobit model, this study has tried to remove selection bias.

The objectives of this research are to verify Lintner's Dividend Model applicability with reference to listed companies of manufacturing sector in Pakistan, this area was less explored in Stock Exchange of Pakistan. Furthermore, this study highlights the stability of dividend paying firms from manufacturing sector of Pakistan by performing sector-wise analysis.

The remaining parts of the paper are structured as follows: brief literature is provided in section 2, followed by data and methodology presented in section 3. Section 4 provides the results and discussion, while section 5 concludes the paper with insights for further studies.

Literature Review

Graham, Dodd & Tatham (1951) had established that the companies paying large amounts as dividend from earnings were highly valued in comparison to those which paid fewer dividends. On the other hand, Miller & Modigliani (1961) debated that the value of firm is independent of its dividend policy. The discussion of Miller & Modigliani (1961) is known as the dividend irrelevancy theory or argument. They discussed that dividend is a flow of assets to the shareholders of a company in form of cash. Therefore, the value creation of stock by transferring of cash (dividend) from the company to its shareholders is strange and illogical. Dividend irrelevancy is clear and obvious like other theories of economics.

Lintner (1956) discussed the factors influencing dividend decisions of firms. He laid the foundation of new possibilities in dividend policy. Lintner (1956) stated that payout decisions are not just a result of what a company decides to invest and save; in fact companies have a stable and well-defined dividend policy. He also explained that companies took their current dividend decisions based on the previous decisions regarding dividend; which means that saving decision is dependent on dividend policy. Lintner observed that companies don't change their dividend policy on regular basis (i.e. it remains stable) by keeping a target payout ratio in mind. He also studied current earnings as a factor effecting dividend policy. Companies determine their current dividends on the basis of previous dividends they paid out to the shareholders. Lintner also noted that managers never want to reduce dividend, indeed they always want an increase.

Michaely & Roberts (2006) conducted a research to test Lintner's model on private and public firms of UK. Results of this research suggested that managers have targeted a long term payout ratio and that in UK public firms paid more dividends than private firms. A share's value/price can be better interpreted by earnings per share (EPS) instead of dividends per share (DPS) (Auret & De Villiers, 2000). Adesola & Okwong (2009) conducted study on Nigerian companies to assess their dividend behavior by using Lintner dividend model. They determined that current earnings and past year dividend had influenced the dividend payout in Nigerian companies. Their work also revealed that dividend payout behavior is independent of firm size and growth. Naceur, Goaied & Belanes (2006) tested Lintner's model by using static and dynamic panel data regression to check whether firms in Tunisia follow stable dividend policy. The results indicated that current earnings is a predictor of dividend policy but past dividends had not have any significant effect in Tunisian firms. The study also revealed that the dividend policy is instable in these firms. Firms with high and stable earnings provide more cash to investors in form of dividends. Similarly, high growth firms have a high payout ratio.

Concentration of ownership was found to have no impact in determination of the dividend policy. Jeong (2008) studied the same in Korean firms and found that face value of stock is the determinant of dividend payments. He argued that dividend in these firms is almost same as the average interest rate of deposits. The reason being that change in fundamentals of the firms is less likely to be because of change in dividend payments of the firms.

Bose &Husain (2011) investigated the determinants of dividend policy and worked on the sectoral analysis of five different sectors of the Indian economy. It was found that most of firms increased their dividend the dividend payout ratio due to high profit and profit is decreased then the amount of dividend payments were also decrease. Therefore, applications of Lintner's model were failed to explain same pattern Indian firms. Asif, Rasool & Kamal (2011) studied the effect of financial leverage on dividend policy by using extended Lintner's model in listed companies of Pakistan for the period of 2002 – 2008. They found negative relationship between dividend payout and financial leverage while a positive relationship was observed between dividend yield and dividend per share. Parasuraman & Ramudu (2012) investigated the different factors which may affect the dividends payment and Lintner (1956) model was used. They found that basic earnings, cash earnings, and lagged dividends exercised highest impact on dividends paid and the findings are relevance of Lintner model of dividend policy. Gupta, Dogra & Vashisht (2013) examined the validity and applicability of known dividend models which are Lintner's model, Brittain's model, Watt's model and Aharony's & Swary's model in Indian Companies and revealed that out of all the models, Lintner's model does have a good fit in the selected Indian companies. Jeong (2013) examined dividend smoothing behavior in Korean stock market with the Lintner model and found that Korean firms smooth dividend less than the U.S. firms.

Baker, Mendel & Wurgler (2015) observed the role of dividend signaling model and found that features investors are not in the favor of dividend cuts. Firms having strong position of cash earnings offers the high dividend to their investors and retain enough cash for next year to avoid the problem of dividend cuts. Therefore, the findings of their model are aligned with Lintner partial-adjustment model, modal dividend changes of zero, because there may be strong reaction dividend cuts which may cause to fail to attract the investors. Chan, Powell, Shi & Smith (2016) analyzed the dividend persistence that how a spurious regression caused the problem. It was compounded by a spurious correlation problem when the dependent and independent variables in dividend behavior regressions are ratios composed of common component variables. They introduced a reformulated Lintner first difference dividend behavior model that is not subject to spurious regression in which shows that past prices predict the changes in dividend.

Baker, Kilincarslan & Arsal (2017) conducted research on Istanbul on dividend policy and the result of their study provides a general support to Lintner's model, signaling theory, catering, firm life cycle theory and bird in hand theory. Al-Najjar &

Kilincarslan (2017) also worked on firms of Turkey and figured out that ISE firms follow the same determinants as the Lintner; firms have long-term payout ratios and adjust their cash dividends by a moderate level of smoothing, and therefore adopt stable dividend policies. Mosionek-Schweda, Mrzygłód & Nowak (2017) conducted research on the companies listed on the stock markets in Brazil, Chile, Colombia, Mexico and Peru in the period of 1994-2015 and figured out the dividend smoothing behavior on selected emerging stock markets of Latin America - except Peru - the dividend smoothing has not been confirmed.

In the classical model Lintner (1956) assumed that dividend payout depends on the net current earnings after tax (profit after tax) and dividend paid during the previous year by the firms i.e. lagged dividend (Div_{t-1}). Firms agree to pay a fixed sum out of their net profits as dividend to common stockholders; yet, due to their inclination for stable dividends, firms may attempt to disburse a small sum determined by the target payout ratio.

Following hypotheses have been drawn based on literature review:
H_1: *Lagged dividend (Div_{t-1}) is positively related to dividend payout of the company*
H_2: *Current earnings per share (EPS_t) is positively related to dividend payout of the companies*

Methodology

Data of two variables (i.e. current earnings and lagged dividend) was collected for the period of nine years starting from 2004 to 2011 from financial reports of each firm. There are total 374 companies in manufacturing sector which are listed in Pakistan Stock Exchange but on the bases of availability of data for selected time period, 263 companies are included in this study. Table 1 shows the population and sample list of manufacturing sector companies:

Table 1: *Manufacturing Sector*

Serial No.	Sectors	Population	Sample
1	Textile Sector	155	103
2	Food Sector	50	36
3	Chemicals Sector	43	31
4	Other Manufacturing Sector	31	26
5	Other Non-Metallic & Minerals Sector	28	14
6	Motor Vehicle and Auto Parts Sector	22	19
7	Fuel & Energy Sector	19	16
8	Coke and Refined Petroleum Sector	09	07
9	Paper, Paperboard & Products Sector	09	05
10	Electrical Machinery and Apparatus Sector	08	06
	Total	374	263

Extreme values were therefore neutralized in the subsequent analysis. Regression was used in this study to explain the dividend behavior, same methodology was employed by Lintner (1956), Darling (1957), and Dobrovolskys (1951). Tobit regression model was used in this study to test the stability of dividend; same technique as employed by Hamed Al-Yahyaee, Pham & Walter (2010). Following Bawa & Kaur (2012), applicability of fixed effect model or random effect model is determined on the basis of Hausman-test. The study used Tobit model in order to remove selection bias by also including the firms which are not paying dividend. A dummy variable was used designating firms paying dividend as 1, otherwise 0.

According to Lintner, dividend functional form is:

$$Div_t = f\ (E_t, Div_{t-1}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where: Div_t = Present Dividends; E_t = Present earnings; and Div_{t-1} = Previous year dividends.

First, the association was hypothesized by Lintner among target dividend and earnings as:

$$Div *_t = r\ E_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where: $Div *_t$ = target dividend payment for the year t; r = target payout ratio; and E_t = earnings in the year t.

In dividend behavior model Lintner also used partial adjustment argument. According to this argument companies will only partially adjust dividends in any given year while reaching the target payout ratio level.

So, the change in dividend payments from year $(t-1)$ to year t is given by:

$$k\ Div_t = Div_t - Div_{t-1} = a_0 + k\ (Div *_t - Div *_{t-1}) + \mu \ldots\ldots\ldots\ldots (3)$$

Where: a_0 = Constant term; k = Adjustment factor; and μ = Random disturbance term.

By substituting $r\ E_t$ for $Div *_t$, since $Div *_t = r\ E_t$ from eqn. 2 we obtain:

$$Div_t - Div_{t-1} = a_0 + k\ (r\ E_t - Div_{t-1}) + \mu$$

$$Div_t - Div_{t-1} = a_0 + k\ r\ E_t - k\ Div_{t-1} + \mu$$

Rearrangement of terms leads to:

$$Div_t = a_0 + k\ r\ E_t + Div_{t-1} - k\ Div_{t-1} + \mu$$

or

$$Div_t = a_0 + k\ r\ E_t + (1-k) Div_{t-1} + \mu$$

or

$$Div_t = a_0 + a_1 E_t + a_2 Div_{t-1} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Since $k\ r$ and $(1-k)$ are impounded in a_1 and a_2 (the regression coefficients), respectively. Target Payout Ratio (r): Companies desire and, therefore, design stable dividend payments in terms of their dividend payout ratio, which is dictated by the organization's present income. In other words, the target payout ratio acts as a guideline to management to follow when the companies intend to declare their dividends. Regression coefficients can be used to derive the target payout ratio through the identity $r = a_1 / (1 - a_2)$. Adjustment Factor(k): In light of solid predisposition against

dividend cuts, rise in income is translated into rise in dividends just slowly to abstain from upcoming plummeting reexamination of dividend. This slack in change of current dividend to the increase in income is a sort of security system intended to make dividends an element of perpetual income instead of temporary dividend that can't be continued. Other terminologies that are used for k are speed of adjustment or reaction coefficient, which is derived from, the identity $k = 1 - a_2$.

Empirical Results

Table 2: *Results of Hausman, Random/Fixed Effect, and Tobit Analysis*

Sectors	Hausman Test			Var.	Fixed/Random Effect Model			Tobit Analysis		
	Chi. Sqr.	d.f	p-value		Co-efft.	F-value	R^2	Co-efft.	Mean Dep.	Avg. log likelihood
Overall Manuf. Sector	930.9	2	0.00	EPS	0.1731 (0.001)	3.67	0.316	0.0196 (0.000)	0.4051	-0.9066
				LD	0.6438 (0.000)			0.0071 (0.029)		
Text.	343.6	2	0.000	EPS	0.0344 (0.004)	3.68	0.318	0.0272 (0.000)	0.2578	-0.7383
				LD	0.174(0 .000)			0.0340 (0.000)		
Chem.	192.6	2	0.000	EPS	0.0232 (0.000)	9.25	0.545	0.0211 (0.000)	0.5778	-0.9434
				LD	0.0445 (0.399)			0.0083 (0.006)		
Engin.	110.1	2	0.000	EPS	0.0768 (0.027)	5.39	0.411	0.0123 (0.000)	0.5029	-0.9335
				LD	0.1372 (0.019)			0.0188 (0.001)		
Sugar	20.8	2	0.000	EPS	0.0707 (0.000)	5.19	0.417	0.1006 (0.000)	0.1759	-0.3821
				LD	0.0213 (0.818)			0.1702 (0.000)		
Paper & Board	4.01	2	0.130	EPS	0.0045 (0.859)	0.69	0.032	0.0104 (0.038)	0.5891	-0.9729
				LD	0.1745 (0.258)			0.0557 (0.063)		
Cem.	19.4	2	0.000	EPS	0.2315 (0.015)	7.29	0.510	0.104 (0.000)	0.3827	-0.6025
				LD	0.0554 (0.607)			0.043 (0.048)		
Fuel and Energ.	31.35	2	0.000	EPS	0.0809 (0.213)	4.63	0.384	0.0048 (0.003)	0.6993 46	-0.9326
				LD	0.0274 (0.722)			0.0050 (0.004)		
Toba.	52.02	2	0.000	EPS	0.7165 (0.000)	12.5	0.494	0.0359 (0.000)	0.6667	-0.6806
				LD	0.2835 (0.159)			0.0050 (0.001)		
Jute	10.86	2	0.004	EPS	0.0699 (0.042)	4.17	0.410	0.0211 (0.085)	0.2500	-0.7096

				LD	0.2913			0.0322		
					(0.133)			(0.801)		
Vana.	6.76	2	0.030	EPS	0.3985	1.92	0.243	0.0399	0.1944	-0.6271
					(0.758)			(0.274)		
				LD	0.2828			0.1102		
					(0.116)			(0.642)		
Misc.	114.1	2	0.000	EPS	2.2624	3.56	0.316	0.0144	0.5017	-0.9464
Manuf.					(0.009)			(0.000)		
				LD	0.2715			0.6590		
					(0.000)			(0.046)		

EPS = Earnings per share; LD = Lagged Dividend and p-value in parenthesis

Table 3: *Major Findings of the Study*

Sectors	Var.	Fixed/Random Effect Model			Tobit Analysis		
		Impact	Speed of Adjustment	DPR	Impact	Speed of Adjustment	DPR
Overall Manuf. Sector	EPS LD	Significant Significant	0.35	0.488	Significant Significant	0.99	0.019
Text.	EPS	Significant	0.83	0.004	Significant	0.96	0.028
	LD	Significant			Significant		
Chem.	EPS	Significant	0.95	0.024	Significant	0.99	0.021
	LD	Insignificant			Significant		
Engin.	EPS	Significant	0.87	0.087	Significant	0.98	0.012
	LD	Significant			Significant		
Sugar	EPS	Significant	0.97	0.070	Significant	0.82	0.12
	LD	Insignificant			Significant		
Paper & Board	EPS	Insignificant	0.82	0.005	Significant	0.94	0.110
	LD	Insignificant			Insignificant		
Cem.	EPS	Significant	0.94	0.240	Significant	0.95	0.100
	LD	Insignificant			Significant		
Fuel and Energ.	EPS	Insignificant	0.97	0.083	Significant	0.99	0.004
	LD	Insignificant			Significant		
Toba.	EPS	Significant	0.71	0.990	Significant	0.99	0.035
	LD	Insignificant			Significant		
Jute	EPS	Significant	0.70	0.098	Insignificant	0.96	0.021
	LD	Insignificant			Insignificant		
Vana.	EPS	Insignificant	0.71	0.550	Insignificant	0.88	0.044
	LD	Insignificant			Insignificant		
Misc. Manuf.	EPS LD	Significant Significant	0.72	3.100	Significant Significant	0.34	0.014

EPS = Earnings per share; LD = Lagged Dividend and DPR= Dividend payout ratio

Hausman test results for overall manufacturing sector and the different industries within that sector show that p-value is less than 0.05, which clearly means that fixed effect model was applicable. However, in case of paper and board sector the p-value is 0.1343 so random effect model was applied. The results reveal that overall trend over the entire period under study, supports the hypothesis that earning per share (EPS) and lagged dividend (LD) are determinant of dividend payout among manufacturing sector firms of Pakistan. Similarly, the above stance is also true for larger sectors in the

economy including textile, engineering and miscellaneous manufacturing sectors. This means that EPS positively affect the dividend payout of firms in Pakistan; which shows that increase in firm's profitability directly affects dividend payout. Moreover, the value of coefficient for all sectors is having positive sign which indicates that Pakistani firms do not prefer to cut dividend when these firms are profitable. Therefore, this study confirms the existence of Lintner's dividend model in manufacturing sector of Pakistan.

The results in table2 reveals that when considering actual value of dividend per share (DPS), the earnings per share (EPS) is a determinant of dividend payout in chemical sector, sugar sector, cement sector, jute sector, and tobacco sector of Pakistan but lagged dividend (LD) has no impact on the dividend payout in these sectors. Further, based on real value of dependent variable, it can also be seen that EPS and LD are not determining dividend payout in paper and board sector, fuel and energy sector and Vanaspati sectors. This means that firms in these sectors neither consider their profitability nor the lagged value of dividend while paying dividend. When considering results of Tobit analysis, it can be seen that when dependent variable is given binary value to distinguish between firms which pay dividend and firms which do not, then only in Jute and Vanaspati sectors both EPS and LD are showing insignificant coefficients, while in paper and board sector only LD is insignificant. This suggests that in all other sectors there is high probability that profitable firms do pay dividend especially when these firms have paid dividend in the past. The results in table 3 suggest that overall manufacturing sector firms of Pakistan have a consistent dividend payout dispensation. Speed of adjustment determines how fast the firms adjust their dividends towards the target ratio; higher adjustment speed shows that there is less smoothness in dividend payout and less dividend stability. If speed of adjustment is more than 0.5 it is generally considered high. Therefore, when considering the sector-wise adjustment speed, results show that smoothening of dividends is not happening. Results of this study are parallel to the study of Bodla, Pal, & Sura, (2007), Ahmad & Javid (2009), Hamed Al-Yahyaee, Pham & Walter (2010), Al-Ajmi & Abo Hussain (2011) and Bawa & Kaur (2012). The study of Mosionek-Schweda, Mrzygłód & Nowak (2017) in the countries Brazil, Chile, Colombia, Mexico and Peru figured out the dividend smoothing behavior except Peru-the dividend smoothing has not been confirmed in any other country; the results are in line with the results of the current study.

Conclusion

This study confirms the applicability of Lintner's model among Pakistani manufacturing sector firms and shows that companies listed on Pakistan Stock Exchange disburse substantial dividends when they are profitable. The overall trend suggests that being a developing market, impact of international financial crisis is not so severe in Pakistan probably because firms operate locally and are shielded from the domino effect which is inflicted among firms of developed economies. Thus, from an international investor perspective, this market should be considered quite lucrative. However, despite giving good returns the market remains volatile and therefore risky. Sectoral performance is uneven and therefore investors need to consider trade-offs between investing in shares of firms where dividend is lower but more consistent versus firms which may provide

higher dividend but more sparingly. The study also suggests that Pakistani manufacturing sector firms use dividend as a signaling device for improving their valuation. However, these firms are unable or unwilling to maintain a smooth and stable dividend payout. This lack of consistency causes problems for local investors and market manipulation becomes a distinct possibility. Fluctuations are also costly for firms in the long run as it increases cost of capital, so smoothening of dividend payout is a preferable strategy which should be adopted by financial managers. Better governance both at country and corporate level is need of the hour in Pakistan if overall economic situation is to improve. SECP should incorporate financial policy consistency in its Code of Corporate Governance. Profitability and growth of manufacturing sector firms in the long run should be the target for regulators and government policy makers which would in turn lead to good dividend payout to investors.

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