Does Lintner Model Explain Dividend Payments of the Indian Banking Sector ?

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Abstract

The present paper attempted to explain the applicability of Lintner models of dividend policy in the banking sector in India. This study was based upon a sample of 21 public and private banks belonging to the Indian banking sector for the period from 2006 to 2015. Lintner's basic model, cash flow model, and segregated cash flow model were found to be the most appropriate in explaining the dividend behaviour in case of constituent banks of the Indian banking sector. Panel data models were used to validate Lintner models of dividend policy. The explanatory variables such as EPS, lagged dividend, cash flow, and capex were found to be the most important variables that affected the current dividend policy of the Indian banks. On the practical dimension, such information should help the banking firms in creating appropriate strategies to improve the dividend payment and firms' performance.

Keywords: **EPS, cash flow, lagged dividend, capital expenditure, Lintner models**

JEL Classification: G3, G35, G350

Paper Submission Date : June 7, 2018 ; Paper sent back for Revision : October 14, 2018 ; Paper Acceptance Date : February 13, 2019

Dividend policy is the most debatable topics in finance. Academicians and researchers have engaged in incorporating the theory to elucidate why companies should pay or not pay dividends. Other investigators originated and through empirical observation tested various models to explain dividend behavior. Some researchers have surveyed corporate managers and institutional investors to define their views about dividends. In spite of extensive deliberations and research, the actual motive for dividend payment remains a puzzle.

Financial experts have examined two characteristics in corporate dividend policies like long- run payout ratio and stability of dividends. The major aspect of dividend policy of a firm is to determine the appropriate allocation of profits between dividend payments and additions to the firm's source of finance in the form of retained earnings. Stable dividends tend to resolve uncertainty in the minds of investors, and also, many a times, have a positive impact on share prices. Many companies follow target dividend payout policy, and increase dividends when they feel that increase in earnings can be maintained.

In terms of the manner in which corporate managers go about setting dividend payments, Lintner's (1956) paper remains the most authoritative study to date. Lintner's study essentially drew three conclusions about dividend

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DOI : 10.17010/ijf/2019/v13i3/142265

policy among U.S. firms. Firstly, firms have long-run target dividend payout ratios expressed as a percentage of earnings ; secondly, managers believe that investors prefer corporations that follow stable dividend policies and accordingly smooth dividend payments over time (managers believe it is better to pay two moderate level dividends than to pay a high one today followed by a low one in the next period) and thirdly ; managers focus more on changes in dividends than on the level of dividends (managers believe that announcing changes in the level of dividend payments provides important information to investors and must be carefully considered). Lintner's behavioural model suggests that the change in dividends is a function of the target dividend payout less the last period's dividend payout multiplied by the speed of an adjustment factor. Lintner (1956) subsequently tested his propositions and found that the partial adjustment model predicted dividends payments more accurately than naive models.

Review of Literature

The seminal paper by Lintner (1956) stands authoritatively till date for setting dividend payments by the corporate managers. Three important suppositions among U.S. firms have been derived from his study. First, all companies have target payout ratios explained as a percentage of earnings. Second, corporate managers presume that claim holders prefer stable payout policy; and third, managers focus more on changing dividend payments than on the level of dividends. Lintner's model suggests that companies wish to maintain a stable dividend policy to maximize shareholder wealth, but fluctuations in business compel managers to project long-run dividends based on the target payout ratio. The model was further tested and it was found that the partial adjustment model predicts dividends accurately than other models.

Lintner's basic dividend model has been retested, and many sophisticated models have been developed to describe dividend behaviour. Brittain (1964) and Fama and Babiak (1968) tested Lintner's model in their studies. It was observed that Lintner's model confirmed well in relation to alternative specifications. Dividend and economy wide earnings data for individual firms were used. Fama also confirmed that the regression results, simulations, and the estimations provided consistency in proving dividend models for individual firms. Brav, Graham, Harvey, and Michaely (2005) reported that in line with Lintner's findings, managers express a strong desire to avoid dividend cuts, except in extreme circumstances. However, Brav reported that in contrast to the Lintner era, managers are more reluctant to increase dividends in tandem with earnings increases, and they no longer view the dividend payout ratio as the primary decision variable. Baker and Powell (2000) concluded from their survey of NYSE - listed firms that dividend determinants are industry specific and anticipated level of future earnings is the major determinant. Aivazian, Booth, and Cleary (2003) found little evidence that book ratio or size affected dividend policy in a significant way. Finally, for emerging market companies, they found that dividends were negatively related to the assets' tangibility and also concluded that higher ROE led to more dividend payments. Ho (2003) presented a comparative study of dividend policies in Australia and Japan. He found the following relationships: dividend policy was positively affected by size in Australia, by liquidity in Japan, and negatively by risk only in Japan. These results supported the agency, the signalling, and the transaction cost theories of dividend policy. Omran and Pointon (2004) investigated the role of dividend policy in determining share prices, the determinants of payout ratios, and the factors that affected the stability of dividends for a sample of 94 Egyptian firms. They found that retentions were more important than dividends in firms with actively traded shares, but that accounting book value was more important than dividends and earnings for non-actively traded firms. Sharma and Panda (2005) studied the large public limited companies for the period from 1969 - 2000; the results showed that among the financial variables - profits, capital structure, sales change, and lagged dividend evidenced significant results except investment.

Foerster and Sapp (2006) investigated the changes in dividend policy for Bank of Montreal, considering the relationships between dividends, prices, and earnings. The results suggested that investors' perception of dividends has changed overtime, allowing management to pay smaller dividends and reinvest funds in the firm. Bodla, Pal, and Sura (2007) re-examined the applicability of Lintner's dividend policy in the banking sector in India. The results indicated that the major determinants of current dividend were lagged dividend and the current earnings in case of both public sector banks and private banks. Pandey and Bhat (2007) emphasized on dividend payout behavior of firms under monetary policy restrictions in India. Their findings suggested that the restricted monetary policies had a significant influence on the dividend payout behavior of Indian firms; they caused about a 5 - 6% reduction in the payout ratios. Sharma (2007) examined dividend behaviour of some of the Indian firms that were listed on BSE from the years 1990 to 2005. The study was an attempt to consider the applicability of one of the relevance and irrelevance of dividend decision, which were two opposite schools of thought. It also examined the applicability of tax theory in India. The study showed that a firm's dividend behaviour was not substantially influenced by a change in the tax structure. Singhania (2007) observed that there was a notable increase in average dividend per share. Research was conducted on the dividend policies adopted by Indian companies in the list of 590 Indian manufacturing firms from 1992 to 2004.

Bhayani (2007) conducted a study on 30 companies in India listed on BSE during 1996 - 97 to 2004 - 05 to examine dividend behaviour using the framework of empirical models. The findings in the study confirmed that the companies supported the Lintner model. Al - Najjar (2009) found that the dividend policy in Jordan was influenced by factors similar to those relating to developed countries such as: leverage ratio, institutional ownership, profitability, business risk, asset structure, growth rate, and firm size. The results showed that the Lintner model was valid in Jordanian data, and that Jordanian firms had target payout ratios, and that they adjusted to their target relatively faster than firms in more developed countries. Sudhadhar (2010) identified the factors affecting corporate dividends using Lintner's model, Brittain's cash flow model, Brittain's explicit depreciation model, and Darling's model for the companies listed on Bombay Stock Exchange (BSE) under group A and B. From regression results, their study found that dividend payment in Indian companies was determined positively by previous year dividend and current year net earnings and was negatively influenced by current year depreciation. Rizvi and Khare (2011) examined the factors affecting dividend payout ratio and found that the study showed positive and significant association between earnings per share (EPS) and dividend payout ratio (DP) and EPS was an important determinant of DP ratio while stock beta was found to have a negative but significant relationship with dividend payout ratio in the banking sector. Also, their results disclosed insignificant relationship with cash flow from operations, debt-equity ratio, and tax to profit before tax ratio.

Haleem, Rehman, and Javid (2011) examined the perceptions of managers of dividend-paying firms listed on the Karachi Stock Exchange (KSE) on factors influencing dividend policy, issues relating to dividend policy, and the corporate governance practices. They found strong support for the life cycle theory followed by agency theory, signaling theory, and the catering theory, respectively and also showed the presence of corporate governance practices in the surveyed firms. Salman's (2013) study showed that DPS, EPS, lagged MPS, and lagged PER had a significant positive relationship with shareholders' wealth.

Numerous factors that have an impact on payout decisions of the firms have been identified by various researchers in past empirical studies. It is noted that many studies have proven earnings of the firms as the primary indicator for the firms to decide about dividend payments. To check if the same factor is the indicator for the chosen banks in India that influences dividend payment, the present study has been conducted.

Objectives of the Study

The following objectives of the study are aimed at :

(1) To analyze the dividend behavior of banks in the Indian banking sector,

(2) To examine the applicability of Lintner's model, Brittain's model, and segregated cash flow model, and variation of these models on dividend behaviour,

(3) To identify the influence of predictor variables substantiated in the prescribed model on dividend payment.

(4) To study the prevalence and relevance of Lintner model of dividend policy.

Research Gap

Numerous studies from 1956 - 2014 (as per literature review) have been conducted on the dividend payout behavior of firms and after validating the Lintner model in various countries across the globe, but still, studies failed to identify very specifically as to what exact factors would drive the payout behavior, particularly in financial institutions. Even though a broad set of such factors have been identified, but specific factors that drive the payout decision in individual sectors and firms of any country may vary depending upon the situation. Upon careful review of the literature on the subject, it is found that there are only few studies that have focused on the applicability of Lintner model in the Indian context. Therefore, there was a need for analyzing as to what banks' dividend payout decision depended upon and the data for the last 10 years were taken for the research study.

Hypotheses

In order to identify the implications and the factors influencing the payout decision, the study proposes to test the following hypotheses :

Model 1

↳ **H_{01}:** The explanatory variables such as EPS and lagged dividend do not have a significant impact on dividend payout ratio of selected nationalized and corporate category banks in India.

↳ **H_{a1}:** The explanatory variables such as EPS and lagged dividend do have a significant impact on dividend payout ratio of selected nationalized and corporate category banks in India.

Model 2

↳ **H_{02}:** The explanatory variables such as CF and lagged dividend do not have a significant impact on dividend payout ratio of selected nationalized and corporate category banks in India.

↳ **H_{a2}:** The explanatory variables such as CF and lagged dividend do have a significant impact on dividend payout ratio of selected nationalized and corporate category banks in India.

Model 3

↳ **H_{03}:** The explanatory variables such as EPS, lagged dividend, capex, and depreciation do not have a significant impact on dividend payout ratio of selected nationalized and corporate category banks in India.

↳ **H_{a3}:** The explanatory variables such as EPS, lagged dividend, capex, and depreciation have a significant impact on dividend payout ratio of selected nationalized and corporate category banks in India.

Model Development

Basic Lintner model, the extended version of Lintner's model, that is, cash flow model and segregated cash flow model, is used for investigating the dividend payment behavior of nationalized and corporate category banks of the Indian banking sector.

Lintner's Basic Model :

$$DPR_{it} = \alpha_i + \beta_1 EPS_{it} + \beta_2 Dividend_{(t-1)} + u_{it} \quad \text{.... Model 1}$$

Cash Flow Model:

$$DPR_{it} = \alpha_i + \beta_1 CF_{it} + \beta_2 Dividend_{(t-1)} + u_{it} \quad \text{.... Model 2}$$

Segregated Cash Flow Model:

$$DPR_{it} = \alpha_i + \beta_1 EPS_{it} + \beta_2 Dividend_{(t-1)} + \beta_3 Depreciation_{it} + \beta_4 Capex_{it} + u_{it} \quad \text{.... Model 3}$$

In the above specifications, *DPR* represents the dividend payout ratio of the selected nationalized and corporate category banks in India. The explanatory variables, *EPS, Dividend*$_{(t-1)}$, *Depreciation,* and *Capex* denote earnings per share, lagged dividend, depreciation, capital expenditure, respectively.

In Lintner Model, two parameters are embedded in the corporation's dividend behavior, that is, *kr* and (1 - *k*) are impounded in β_1 and β_2(regression coefficients), respectively. These parameters are explained as follows :

↳ **Target Payout Ratio *(r)* :** Target payout ratio is a firm's long-run dividend-to-earnings ratio. The firm's policy is to attempt to pay out a certain percentage of earnings, but it pays a stated or pays stable dividend and adjusts it to the target as base line increases in earnings occur. The target payout ratio is computed using regression coefficients, that is,

$$r = \beta_1 / (1 - \beta_2)$$

↳ **Adjustment Factor *(k)* :** Can interpret the quantity $(1 - \beta_2)$ as a safety factor that the management uses to avoid increasing the dividend payment to levels that cannot be maintained.

$$k = 1 - \beta_2$$

Methodology

(1) Sample and Data Sources : The study constitutes public and private sector banks of the Indian banking sector as the sample. The reference period for the present study is from the year 2006 - 2015, that is, a period of 10 years. The data were sourced from Bloomberg database. The analysis was carried out on panel data depending on the requirements of the techniques used for analysis. In order to explain the implications of the study and to test the hypotheses, analysis has been performed using Strata. The sample banks chosen for the study are: Allahabad Bank, Andhra Bank, Bank of Baroda, Bank of India, Bank of Maharashtra, Canara Bank, Corporation Bank, City Union Bank, Federal Bank, HDFC Bank, ICICI Bank, Kotak Mahindra Bank, Karur Vysya Bank, Lakshmi Vilas

Bank, Oriental Bank of Commerce, Punjab National Bank, State Bank of Bikaner & Jaipur, State Bank of India, State Bank of Mysore, State Bank of Travancore, and South Indian Bank.

(2) Tools of Analysis

↳ **Lintner Model :** As discussed in the methodology used for the Lintner model, the following tests were conducted for selection of appropriate panel data models :

The study is based on the theoretical model set by John Lintner. Lintner (1956) developed a model to study the determinants of the dividend behavior of American corporations assuming that the dividend payout is a function of net current earnings after tax (PAT) and dividend paid during the previous year, that is, lagged dividend (Div t - 1). Companies decide to pay out a fixed proportion of their net profits as dividend to common stockholders, but in view of their well-known preference for stable dividends, they may try to achieve the target level only by a fraction of the amount indicated by the target payout ratio, whenever profit changes. The above - mentioned theoretical formulation of Lintner has been used as an estimating equation for corporate dividend in the present study, which is as follows :

$D^*_{it} = \alpha_i E_{it}$
$D_{it} - D_{i(t-1)} = a_i + C_i \{D^*_{it} - D_{i(t-1)}\} + u_i$
where,
D^*_{it} = desired dividend payment during period $'t'$,
D_{it} = Actual dividend payment during period $'t'$,
α_i = Target payout ratio,
E_{it} = Earnings of firm during period $'t'$,
a_i = a constant related to dividend growth,
C_i = partial adjustment factor,
u_{it} = error term,

$$D_{it} - D_{i(t-1)} = a_i + C_i \{\alpha_i E_{it} - D_{i(t-1)}\} + u_{it}$$
$$D_{it} = a_i + \alpha_i C_i E_{it} + (1 - C_i) D_{i(t-1)} + u_{it}$$

This model can further be simplified in the form of a multiple regression equation :

$$D_{it} = a_i + \alpha_i E_{it} + C_i D_{(t-1)} + u_{it}$$

To understand the relationship between dividend and earnings (PAT), a panel data analysis was carried out in respect of banks which are the constituent of the Indian banking industry. The study considers a panel data of 10 years, that is, from 2006 to 2015.

Data Analysis and Results

The panel data results of Lintner, Brittain, and segregated cash flow models using fixed and random effect model are shown in the following tables :

Table 1 shows the estimation of the fixed effect model and random effect model on the predictors of dividend payout ratio of nationalized and corporate category banks in India, which is based on Lintner's basic dividend

Table 1. Fixed Effect Model and Random Effect Model of Dividend Payout Ratio of Nationalized and Corporate Category Banks in India

(Based on Lintner's Basic Dividend Model)

Variables	Fixed Effect Model	Random Effect Model
Constant	25.721* (13.57)	24.070* [11.64]
EPS	0.1870* (3.21)	0.1358* [3.21]
Dividend (*t* - 1)	0.005*** (1.74)	0.0186*** [1.81]
Hausman Test {*p* - value}	243.28* {0.000}	
Wald - λ^2	--	11.40*
F - test	5.27*	--
Target Payout Ratio	0.188	0.138
Adjustment Factor	0.994	0.981

Note. *** and * denote significance at 1% and 10% levels, respectively. ( ) and [ ] - Figures in parentheses show *t* - value and *Z* - value, respectively.

model. The Lintner basic dividend model considers the dividend payout ratio as the dependent variable and treats the EPS and lagged dividend as the independent variables. Hausman specification test supports a fixed effect model for the Lintner's basic dividend model. The empirical results reveal that the EPS and lagged dividend have a positive and significant impact on the dividend payout ratio at 1% and 10% levels, respectively. Thus, the null hypothesis that the explanatory variables such as EPS and lagged dividend do not have a significant impact on the dividend payout ratio of the selected nationalized and corporate category banks in India has been rejected. This inference drawn from the fixed effect model endorses the suggestion of Lintner (1956). The constant term of selected nationalized and corporate category banks are statistically significant at the 1% level of significance.

Also, Table 1 exhibits the target payout ratio and adjustment factor with respect to the dividend payout ratio of the selected nationalized and corporate category banks in India. It is further observed that the target payout ratio is low (0.1880) and the adjustment factor is pretty high (0.9945), indicating that the management of the Indian banking industry fails to smooth dividends. Despite the high adjustment factor, the rapidity to attain the target is

Table 2. Fixed Effect Model and Random Effect Model of Dividend Payout Ratio of Nationalized and Corporate Category Banks in India

(Based on Brittain's Cash Flow Model)

Variables	Fixed Effect Model	Random Effect Model
Constant	20.173* (20.41)	20.043* [12.27]
CF	0.0185** (2.38)	0.004*** [0.60]
Dividend (*t* - 1)	0.011*** (1.67)	0.026 [1.12]
Hausman test {*p* - value}	11.73* { 0.002}	
Wald- λ^2	--	3.58*
F - test	2.93**	--
Target Payout Ratio	0.0185	0.004
Adjustment Factor	0.989	0.973

Note. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively. ( ) and [ ] - Figures in parentheses show *t* - value and *Z* - value, respectively.

Table 3. Fixed Effect Model and Random Effect Model of Dividend Payout Ratio of Nationalized and Corporate Category Banks in India

(Based on Segregated Cash Flow Model)

Variables	Fixed Effects Model	Random Effects Model
Constant	38.83* (4.14)	29.124* [4.01]
EPS	0.473** (1.97)	0.153*** [1.89]
Dividend (*t* - 1)	0.006** (2.18)	0.0016** [2.05]
Depreciation	0.006 (1.44)	0.010 *** [1.89]
Capex	0.009** (1.93)	0.009** [1.97]
Hausman test {*p* - value}	2.80 {0.591}	
Wald- λ^2	--	7.22*
F - test	3.22**	--
Target Payout Ratio	0.476	0.153
Adjustment Factor	0.994	0.998

Note. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively. ( ) and [ ] - Figures in parentheses show *t* - value and *Z* - value, respectively.

low in the case of selected nationalized and corporate category banks in India.

Table 2 displays the estimation of the fixed effect model and random effect model on the variables of the dividend payout ratio of nationalized and corporate category banks in India, which is based on Brittain's cash flow model. The Brittain's cash flow model considers the dividend payout ratio as the endogenous variable and treats the cash flow (CF) and lagged dividend as the exogenous variables. Brittain's cash flow model supports Hausman specification test in a fixed effect model. The empirical results show that the cash flow (CF) and lagged dividend have a positive and significant impact on the dividend payout ratio at 5% and 10 % levels, respectively. Thus, the null hypothesis that the endogenous variables such as cash flow (CF) and lagged dividend do not have a significant influence on the dividend payout of the selected nationalized and corporate category banks in India has been rejected. The constant term of selected banks is statistically significant at the 1% level of significance.

Besides, the target payout ratio and adjustment of the speed relating to a dividend payout of the selected nationalized and corporate category banks in India is found to be low (0.0185) and high (0.989) respectively, implying that the managements of Indian commercial banks failed to smooth dividends. Despite high adjustment factor, the rapidity to achieve the target is low in the case of selected nationalized and corporate category banks in India. This inference is consistent with the findings from Lintner's basic dividend model.

The Table 3 describes the estimation of the fixed effect model and random effect model on the variables of segregated cash flow model on dividend payout ratio of nationalized and corporate category banks in India. The segregated cash flow model considers the dividend payout ratio as the endogenous variable and earnings per share, lagged dividend, depreciation, and capex as exogenous variables. Hausman specification test supports the random effect model for the segregated cash flow model. The results present that EPS, lagged dividend, and capex show a positive and significant association with the dividend payout ratio at 5% percent levels. Thus, the null hypothesis that the explanatory variables such as the EPS, lagged dividend, and capex of the selected nationalized and corporate category banks in India has been rejected. This implies that the EPS, lagged dividend, and capex are the important variables influencing dividend payout ratio of the selected nationalized and corporate category banks in India. However, the other explanatory variable, that is, depreciation is found to be statistically insignificant. This implies that the depreciation variable does not influence the dividend payout ratio of the

Table 4. OLS Regression Results on Lintner Basic Dividend Model

Banks	Variables	Coefficient	*t* -Statistics	R^2	*F*-Statistics	DW Statistics	Target Payout Ratio	Adjustment Factor
Allahabad Bank	*EPS*	0.127	1.739***	0.611	3.584*	2.016	0.129	0.984
	Div.(*t* -1)	0.015	1.763***					
	Constant	14.655	3.324*					
Andhra Bank	*EPS*	2.038	1.872*	0.642	3.819*	1.744	2.212	0.921
	Div.(*t* - 1)	0.078	2.243**					
	Constant	62.637	3.535*					
Bank of Baroda	*EPS*	0.196	2.314**	0.745	5.141*	1.860	0.180	1.088
	Div.(*t* - 1)	-0.088	-2.215**					
	Constant	25.268	2.508**					
Bank of India	*EPS*	0.029	2.255**	0.752	7.284*	1.941	0.024	1.228
	Div.(*t* - 1)	-0.228	-1.670***					
	Constant	22.822	3.228*					
Bank of	*EPS*	2.587	1.663***	0.651	5.243*	2.022	2.382	1.086
Maharashtra	*Div.*(*t* -1)	-0.086	-2.232**					
	Constant	20.814	2.608*					
Canara Bank	*EPS*	13.266	2.071**	0.781	2.160***	2.462	9.873	1.343
	Div.(*t*-1)	-0.343	-2.043**					
	Constant	951.959	2.434**					
Corporation	*EPS*	0.116	2.230**	0.688	3.811*	1.693	0.112	1.031
Bank	*Div.*(*t*-1)	-0.031	-1.745***					
	Constant	23.120	5.183*					
City Union Bank	*EPS*	0.365	1.877***	0.691	2.828**	1.820	0.444	0.820
	Div.(*t*-1)	0.179	2.497**					
	Constant	14.813	2.211**					
Federal Bank	*EPS*	0.391	2.351**	0.641	2.815**	2.635	0.755	0.518
	Div.(*t*-1)	0.481	1.756***					
	Constant	11.512	2.607*					
HDFC Bank	*EPS*	0.004	2.446**	0.763	2.203***	2.260	0.005	0.885
	Div.(*t* - 1)	0.114	1.918***					
	Constant	16.857	2.436**					
ICICI Bank	*EPS*	0.557	2.496**	0.801	14.135*	1.966	0.758	0.735
	Div.(*t* - 1)	0.264	1.915***					
	Constant	27.367	2.599*					
Kotak	*EPS*	0.102	2.608*	0.900	3.503*	1.661	0.089	1.145
Mahindra Bank	*Div.*(*t* - 1)	-0.145	-2.477**					
	Constant	4.404	6.680*					
Karur Vysya Bank	*EPS*	0.832	2.516**	0.592	3.390*	2.176	0.811	1.026
	Div.(*t* -1)	-0.026	-2.098**					

	Constant	64.408	3.835*					
LVB Bank	*EPS*	1.176	1.695***	0.581	2.368***	2.250	1.108	1.060
	Div.(*t*-1)	-0.060	-2.305**					
	Constant	19.059	3.677*					
Oriental Bank	*EPS*	0.080	1.957***	0.634	2.545**	1.749	0.073	1.092
of Commerce	*Div.*(*t* -1)	-0.092	-2.316**					
	Constant	17.625	4.438*					
Punjab National	*EPS*	0.098	1.714***	0.783	2.784**	2.126	0.175	0.558
Bank	*Div.*(*t* -1)	0.441	1.746***					
	Constant	12.341	2.218**					
SBBJ Bank	*EPS*	0.026	1.706***	0.597	5.201*	2.074	0.045	0.596
	Div.(*t* -1)	0.403	1.805***					
	Constant	11.322	1.907***					
SBI Bank	*EPS*	0.110	1.772***	0.665	2.265***	2.270	0.134	0.826
	Div.(*t* -1)	0.173	1.697***					
	Constant	10.672	3.596*					
SBM Bank	*EPS*	0.010	2.175**	0.728	2.373***	1.750	0.019	0.537
	Div.(*t* -1)	0.462	1.803***					
	Constant	6.296	1.734***					
SBT Bank	*EPS*	0.005	2.112**	0.848	2.478***	1.776	0.006	0.776
	Div.(*t* -1)	0.223	1.695***					
	Constant	9.580	1.735***					
SIB Bank	*EPS*	0.057	2.056**	0.713	2.951**	1.759	0.046	1.237
	Div.(*t* -1)	-0.237	-1.823***					
	Constant	23.861	7.004*					

Note. ***, **, & * represent 1%, 5%, and 10% significance levels, respectively.

selected nationalized and corporate category banks in India. The study results suggest that the EPS, lagged dividend, and capex are the important variables influencing the dividend payout ratio of the selected nationalized and corporate category banks in India.

This inference drawn from the random effect model approves the proposition of Lintner (1956) because of the significant influence of EPS and lagged dividend on the payout ratio of nationalized and corporate category banks in India. Even, positive and significant constant term supports the Lintner model. Further, in relation to the dividend payout ratio, adjustment factor and target payout ratio of the selected nationalized and corporate category banks in India is found to be low (0.1534) and high (0.9984), respectively, implying that the managements of the Indian commercial bank industry failed to smooth dividends. Despite high adjustment factor, the quickness to accomplish the target is low in the case of selected nationalized and corporate category banks in India. This inference is consistent with the findings from the Lintner basic dividend model and Brittain's cash flow model.

The Table 4 illustrates the estimates of the OLS regression about the explanatory variables of the dividend payout ratio of individual selected 21 nationalized and corporate category banks in India, which is based on

Lintner's basic dividend model. The Lintner's basic dividend model considers the dividend payout ratio as the endogenous variable and EPS and lagged dividend of the 21 individual nationalized and corporate category banks as the exogenous variables. The empirical findings reveal that the EPS and lagged dividend are statistically significant. Thus, the null hypothesis that the explanatory variables such as the EPS and lagged dividend are not associated with the payout policy of the selected 21 individual nationalized and corporate category banks in India has been rejected. This implies that the EPS and lagged dividend are the important determinants of the dividend payout ratio of the selected 21 nationalized and corporate category banks in India. This inference drawn from the OLS regression model approves the proposition of Lintner (1956) because of the significant influence of EPS and lagged dividend on the dependent variable : dividend payout ratio of public and private banks. Besides, the positive and significant constant terms in the case of 21 selected nationalized and corporate category banks in India support the Lintner model. Further, in relation to the dividend payout ratio, adjustment factor and target payout ratio of the selected nationalized and corporate category banks in India is found to be low and high in most of the cases, respectively, implying that the managements of Indian commercial banks failed to smooth dividends. Despite the high adjustment factor, the quickness to accomplish the target is low in the case of the selected nationalized and corporate category banks in India.

The OLS model results are presented in the Table 4, which reveals that the estimated regression models explain well the dividend payout ratio of the selected 21 sample nationalized and corporate category banks. The *F*-statistics is statistically significant at 1%, 5%, and 10% significance levels. R^2, the coefficient of determination in the regression model, ranges from 58% to 90%, signifying a good explanation by the independent variables on the dependent variable. The absence of autocorrelation is evidenced by the Durbin - Watson statistics, indicating the robustness of the regression model of all banks.

The Table 5 depicts regression estimates of OLS model about the variables of dividend payout ratio of individual selected 21 nationalized and corporate category banks in India, which is based on Brittain's cash flow model. The model considers the dividend payout ratio as response variable and cash flow (CF) and lagged dividend of the 21 individual nationalized and corporate category banks as the predictor variables. The empirical findings reveal that the predictors : cash flow and lagged dividend have a statistically significant impact on the dividend payout ratio of the respective nationalized and corporate category banks in India. Thus, the null hypothesis that the cash flow and lagged dividend have no significant impact on the dividend payout ratio of the selected 21 individual nationalized and corporate category banks in India has been rejected. This implies that cash flow (CF) and lagged dividend are important variables of the dividend payout ratio of the selected 21 nationalized and corporate category banks in India. This inference drawn from the OLS regression model approves the proposition of Lintner (1956) because of the significant influences of cash flow (CF) and lagged dividend on the dependent variable, dividend payout ratio. Also, the positive and significant constant terms in the case of 21 selected nationalized and corporate category banks in India support the Brittain model. Further, in relation to the dividend payout ratio, adjustment factor and target payout ratio of the selected nationalized and corporate category banks in India is found to be low and high in most of the cases, respectively, implying that the managements of Indian commercial banks failed to smooth the dividends. Despite high adjustment factor, the quickness to accomplish the target is low in the case of the selected nationalized and corporate category banks in India. These findings are consistent with the results of Lintner's basic dividend model.

The OLS model results presented in the Table 5 also reveal that the estimated regression models nicely explain the dividend payout ratio of the selected 21 individual nationalized and corporate category banks ; the *F*- statistics is significant statistically at 1%, 5%, and 10% significance levels. R^2, the coefficient of determination in the above regression models, ranges from 53% to 96%, signifying a good explanation by independent variables on the dependent variable. The absence of autocorrelation is evidenced by the Durbin - Watson statistics, indicating the robustness of the regression model of all banks.

Table 5. OLS Regression Results on Brittain's Cash Flow Model

Banks	Variables	Coefficient	*t* -Statistics	R^2	*F*-Statistics	DW Statistics	Target Payout Ratio	Adjustment Factor
Allahabad Bank	*CF*	0.000	-2.015**	0.657	2.216***	2.100	0.000	0.986
	Div.(*t* - 1)	0.013	1.672***					
	Constant	17.769	8.040*					
Andhra Bank	*CF*	0.571	-1.872***	0.709	2.429***	1.682	0.478	1.194
	Div.(*t* - 1)	-0.194	-1.728***					
	Constant	57.238	2.373**					
Bank of Baroda	*CF*	0.032	1.740***	0.897	3.378*	2.121	0.047	0.683
	Div.(*t* -1)	0.316	1.831***					
	Constant	12.672	1.755***					
Bank of India	*CF*	0.004	1.716***	0.900	4.392*	1.774	0.005	0.767
	Div.(*t*-1)	0.232	-1.673***					
	Constant	21.688	3.513*					
Bank of	*CF*	0.050	-2.281**	0.617	3.062*	1.993	0.047	1.080
Maharashtra	*Div.*(*t*-1)	-0.080	-2.210**					
	Constant	41.218	2.092**					
Canara Bank	*CF*	1.682	2.177**	0.767	5.703*	2.294	1.395	1.205
	Div.(*t*-1)	-0.205	-2.576*					
	Constant	488.213	1.686***					
Corporation Bank	*CF*	0.019	2.424**	0.837	4.135*	1.722	0.017	1.110
	Div.(*t*-1)	-0.110	-1.837***					
	Constant	22.972	4.609*					
City Union Bank	*CF*	0.187	-1.696***	0.960	3.670*	1.691	0.246	0.761
	Div.(*t*-1)	0.238	1.680***					
	Constant	13.402	2.147**					
Federal Bank	*CF*	0.075	-1.902***	0.599	2.330***	2.053	0.106	0.712
	Div.(*t*-1)	0.287	1.704***					
	Constant	12.955	2.865*					
HDFC Bank	*CF*	0.010	-2.767*	0.552	4.323*	2.260	0.011	0.875
	Div.(*t*-1)	0.124	2.478**					
	Constant	16.913	3.400*					
ICICI Bank	*CF*	0.098	-2.565*	0.806	14.600*	1.823	0.376	0.262
	Div.(*t*-1)	0.737	4.110*					
	Constant	10.095	1.811***					
Kotak	*CF*	0.003	2.232**	0.921	4.078*	1.968	0.003	1.041
Mahindra Bank	*Div.*(*t*-1)	-0.041	-2.325**					
	Constant	2.935	5.740*					
Karur Vysya Bank	*CF*	0.045	2.046**	0.694	3.282*	1.850	0.047	0.963
	Div.(*t*-1)	0.036	2.125**					

	Constant	49.749	3.433*					
LVB Bank	*CF*	0.154	-2.453**	0.634	4.069*	2.101	0.152	1.014
	Div.(*t*-1)	-0.014	-2.072**					
	Constant	25.642	5.327*					
Oriental Bank	*CF*	0.010	2.807*	0.539	4.103*	2.280	0.012	0.883
of Commerce	*Div.*(*t*-1)	0.116	1.728***					
	Constant	16.485	5.707*					
Punjab	*CF*	0.040	-1.706***	0.708	3.922*	2.309	0.066	0.607
National Bank	*Div.*(*t*-1)	0.392	1.774***					
	Constant	12.621	2.292**					
SBBJ Bank	*CF*	0.000	2.230**	0.572	4.683*	2.010	0.000	0.419
	Div.(*t*-1)	0.580	3.057*					
	Constant	5.868	1.675***					
SBI Bank	*CF*	0.035	1.689***	0.653	2.908**	2.183	0.044	0.810
	Div.(*t*-1)	0.189	1.736***					
	Constant	11.002	4.376*					
SBM Bank	*CF*	0.010	-1.701***	0.614	2.473***	2.286	0.017	0.597
	Div.(*t*-1)	0.402	1.677***					
	Constant	7.977	1.944***					
SBT Bank	*CF*	0.013	-1.772***	0.821	3.484*	2.081	0.022	0.573
	Div.(*t*-1)	0.426	1.981**					
	Constant	9.667	1.892***					
SIB Bank	*CF*	0.117	-1.706***	0.765	2.266***	1.656	0.094	1.242
	Div.(*t*-1)	-0.242	-1.772***					
	Constant	24.966	7.463*					

Note. ***, **, & * represent 1%, 5%, and 10% percent significance levels, respectively.

The Table 6 presents the OLS regression estimates on the determinants of the dividend payout ratio of the individual selected 21 nationalized and corporate category banks in India, which is based on Lintner's third model. Lintner's third model considers the dividend payout ratio as the dependent variable and treats EPS, lagged dividend, depreciation, and capex of the 21 individual nationalized and corporate category banks as the independent variables. The empirical findings reveal that the EPS, lagged dividend, and capex are found to have a statistically significant impact on the dividend payout ratio of the respective nationalized and corporate category banks in India. Thus, the null hypothesis that the explanatory variables such as EPS, lagged dividend, and capex do not have a significant impact on the dividend payout ratio of the selected 21 individual nationalized and corporate category banks in India has been rejected. However, the depreciation variable is found to be statistically insignificant in a majority of the cases of the nationalized and corporate category banks in India. This implies that these variables do not have significant influences on the dividend payout ratio of the selected nationalized and corporate category banks in India. The study results suggest that the EPS, lagged dividend, and capex are the important determinants of the dividend payout ratio of the selected 21 nationalized and corporate category banks in India. This inference drawn from the OLS regression model approves the proposition of Lintner (1956) because of the significant influences of EPS and lagged dividend on the dividend payout ratio of the selected individual

Table 6. OLS Regression Results on Segregated Cash Flow Model

Banks	Variables	Coefficient	*t* - Statistics	R^2	*F*-Statistics	DW Statistics	Target Payout Ratio	Adjustment Factor
Allahabad	*Depreciation*	0.023	1.108	0.633	3.955*	2.028	0.048	0.985
Bank	*Capex*	0.011	1.892***					
	EPS	0.047	2.232**					
	Div.(*t*-1)	0.014	1.795***					
	Constant	12.880	2.276**					
Andhra Bank	*Depreciation*	0.062	1.998**	0.653	2.352***	1.828	2.063	1.384
	Capex	0.033	1.977**					
	EPS	2.856	-2.456**					
	Div.(*t*-1)	-0.384	-1.788***					
	Constant	72.403	1.858***					
Bank of Baroda	*Depreciation*	-0.002	-1.026	0.855	7.396*	2.094	0.272	1.403
	Capex	-0.002	-3.723*					
	EPS	0.382	-3.142*					
	Div.(*t*-1)	-0.403	-1.752***					
	Constant	30.882	5.757*					
Bank of India	*Depreciation*	0.009	1.070	0.728	2.938**	1.629	0.015	1.807
	Capex	0.001	1.758***					
	EPS	0.028	-2.262**					
	Div.(*t*-1)	-0.807	-1.719***					
	Constant	25.903	3.714*					
Bank of	*Depreciation*	0.126	1.063	0.694	2.815**	2.029	3.203	1.104
Maharashtra	*Capex*	0.080	1.698***					
	EPS	3.536	1.940***					
	Div.(*t*-1)	-0.104	-2.286**					
	Constant	-0.134	-2.002**					
Canara Bank	*Depreciation*	-0.096	-0.118	0.797	3.825*	2.098	9.491	1.349
	Capex	0.001	2.004**					
	EPS	12.806	-1.684***					
	Div.(*t*-1)	-0.349	-1.899***					
	Constant	1128.113	2.285**					
Corporation	*Depreciation*	-0.004	-1.232	0.825	3.924*	1.994	0.139	1.042
Bank	*Capex*	-0.000	-2.468**					
	EPS	0.145	-1.754***					
	Div.(*t*-1)	-0.042	-2.194**					
	Constant	26.144	5.293*					
City Union	*Depreciation*	0.004	1.210	0.707	3.327*	1.801	0.355	0.866
Bank	*Capex*	0.002	2.306**					
	EPS	0.307	-2.270**					

	Div.(*t*-1)	0.133	2.255**					
	Constant	15.418	1.670***					
Federal Bank	*Depreciation*	0.009	0.848	0.628	3.937*	2.003	2.471	0.618
	Capex	0.001	2.167**					
	EPS	1.529	-1.737***					
	Div.(*t*-1)	0.381	1.993**					
	Constant	13.161	2.344**					
HDFC Bank	*Depreciation*	0.000	1.075	0.764	4.360*	2.083	0.033	0.649
	Capex	0.000	1.999**					
	EPS	0.022	-1.693***					
	Div.(*t*-1)	0.350	1.747***					
	Constant	12.422	1.857***					
ICICI Bank	*Depreciation*	-0.001	-1.499	0.962	32.030*	1.771	0.657	0.956
	Capex	-0.000	-4.620*					
	EPS	0.629	-4.200*					
	Div.(*t*-1)	0.043	2.216**					
	Constant	37.110	6.316*					
Kotak	*Depreciation*	0.000	2.517**	0.644	5.492*	1.912	0.144	1.121
Mahindra Bank	*Capex*	0.000	2.572*					
	EPS	0.162	-1.896***					
	Div.(*t*-1)	-0.121	-1.971**					
	Constant	4.014	3.224*					
Karur	*Depreciation*	-0.005	-0.125**	0.592	6.819*	2.007	1.426	0.970
Vysya Bank	*Capex*	-0.025	-1.808***					
	EPS	1.384	-2.198**					
	Div.(*t*-1)	0.029	2.101**					
	Constant	64.367	3.353*					
LVB Bank	*Depreciation*	0.018	0.736	0.555	3.562*	2.019	2.442	1.096
	Capex	0.030	1.724***					
	EPS	2.676	2.178**					
	Div.(*t*-1)	-0.096	-2.420**					
	Constant	17.654	3.320*					
Oriental Bank	*Depreciation*	0.004	0.202	0.816	5.552*	2.159	0.127	1.681
of Commerce	*Capex*	-0.002	-1.679***					
	EPS	0.213	3.774*					
	Div.(*t*-1)	-0.681	-3.014*					
	Constant	15.773	6.538*					
Punjab	*Depreciation*	-0.001	-0.580	0.677	5.480*	2.158	0.094	0.782
National Bank	*Capex*	5.59E-05	2.058**					
	EPS	0.073	2.216**					
	Div.(*t*-1)	0.217	2.449**					

	Constant	18.068	1.921***					
SBBJ Bank	*Depreciation*	0.003	0.700	0.662	4.450*	2.009	0.087	0.629
	Capex	-0.001	-1.868***					
	EPS	0.055	-1.778***					
	Div.(*t*-1)	0.370	1.997**					
	Constant	11.421	2.307**					
SBI Bank	*Depreciation*	-9.26E-05	-2.231**	0.795	3.523*	2.189	0.072	0.667
	Capex	-0.000	-2.452**					
	EPS	0.048	-2.115**					
	Div.(*t*-1)	0.332	1.690***					
	Constant	10.170	2.498**					
SBM Bank	*Depreciation*	-0.027	-1.602	0.678	2.637**	1.631	0.032	1.311
	Capex	-0.000	-2.044**					
	EPS	0.042	-1.790***					
	Div.(*t*-1)	-0.311	-1.736***					
	Constant	30.208	1.823***					
SBT Bank	*Depreciation*	-0.048	-0.210	0.543	2.489***	2.095	0.068	0.768
	Capex	-0.010	-1.714***					
	EPS	0.052	-1.729***					
	Div.(*t*-1)	0.231	1.672***					
	Constant	32.423	2.429**					
SIB Bank	*Depreciation*	-0.027	-0.340	0.676	2.612**	1.972	2.206	1.322
	Capex	-0.002	-1.670***					
	EPS	2.917	1.688***					
	Div.(*t*-1)	-0.322	-2.294**					
	Constant	23.033	8.691*					

Note. ***, **, & * represent 1%, 5%, and 10% percent significance levels, respectively.

Indian commercial banks. Moreover, the positive and significant constant terms in the case of 21 selected nationalized and corporate category banks in India support the Lintner model. Further, the target payout ratio and adjustment factor relating to the dividend payout ratio of the selected 21 nationalized and corporate category banks in India is found to be low and high in most of the cases, respectively, implying that the managements of Indian commercial banks failed to smooth the dividends. Despite high adjustment factor, the speed to achieve the target is low in majority of the selected 21 nationalized and corporate category banks in India. This finding is consistent with the results of Lintner's first and second models.

The OLS model results presented in the Table 6 reveal that the estimated regression models adequately explain the dividend payout ratio of the selected 21 individual nationalized and corporate category banks; the F- statistics is statistically significant at 1%, 5%, and 10% significance levels. R^2, the coefficient of determination in the above regression models, ranges from 54% to 96%, signifying good explanation by the independent variables on the dependent variable. The absence of autocorrelation is evidenced by the Durbin - Watson statistics, indicating the robustness of the regression model of all banks.

Results of Hypotheses Testing

Model Number	Model	Null Hypothesis (H_0)	Alternate Hypothesis (H_a)
1	Lintner's Basic Model	Rejected	Accepted
2	Brittain's Cash Flow Model	Rejected	Accepted
3	Segregated Cash Flow Model	Rejected	Accepted

Findings

(1) The empirical findings based on Lintner's basic dividend model reveal that earnings and lagged dividend are significant in determining dividends of chosen banks in India.

(2) Based on Brittain's model, the explanatory variables : cash flow and lagged dividend have a positive influence on dividend payout ratio of nationalized and corporate category banks of the Indian banking sector.

(3) The third model called explicit depreciation model with inclusion of capex variable to study the impact on dividend payout reveals that earnings, lagged dividend, and capex variables are positively significant ; whereas, depreciation has a negative impact on the dividend for the chosen banks during the period of the study.

(4) It is also observed in the above models that the target payout ratio is low, that is, approximately 0.18 ; whereas, the adjustment factor is high to an extent of 0.99.

Conclusion

↳ Lintner's, Brittain's, and segregated cash flow models have been found to be the most appropriate in explaining the dividend behaviour in case of Indian public and private sector banks. In other words, EPS, lagged dividend, cash flow, and capex are the crucial factors that affect the current dividend policy of the Indian public and private banks. On the practical dimension, the evidence provided in the study will help banking institutions in defining their profit distribution strategies and invariably contribute to the growth and development of the banks.

↳ The finance specialists in an organization must perceive their profit distribution in the form of dividend cautiously, as it is critical to the stockholders who forego a substantial amount in order to obtain relevant information relating to it. Dividend distributed to shareholders is very crucial as it affects the market price of shares. The study validates the applicability of Lintner model and the extended versions. This suggests that the finance managers cannot afford to ignore the variables such as EPS, lagged dividend, cash flow, and capex while framing a dividend policy of the selected individual Indian public and private banks.

↳ The Indian scheduled nationalized and corporate category banks are distinguished by a very low target payout coupled with high speed of adjustment coefficients. This implies low dividend smoothing and less stability on the part of the Indian nationalized and corporate category banks in pursuing their dividend decisions and policies. The principal determinant of dividend policy is profitability. Thus, banks use dividends to signal their surge in profit margins over the years. It is further seen that nationalized and corporate category banks do not attempt to sustain stable dividends. The dividend payments may fluctuate with variations in earnings.

The regularity of dividend payment and constancy of its rate is not an important objective of the dividend policy followed by the banking industry in India. These findings are validated by the fact that the banking sector is

characterized by low target payout ratio and high speed of adjustment factor. In a nutshell, it can be stated that there is low smoothing and instability of dividend policy in the banking sector. Low payout ratio and high adjustment factor indicate that the respective nationalized and corporate category banks in India frequently change their dividend payments with changes in earnings, and dividend smoothing is of low order.

Limitations of the Study and Scope for Further Research

The study is entirely based on published data and hence it suffers from all the limitations arising on account of financial reporting that is yet to embrace IFRS or the adapted version of the same. The study period has been restricted to 2015 as SBI's associate banks were merged in the mid of 2016. Taking data beyond 2015 would have led to a decrease in the sample size. Also, many chosen sample banks have not declared dividends post 2015 due to a lot of government interventions in the banking sector.

This study focused on the financial sector that involves money changers, which by its very nature is a highly leveraged model. Further research studies can be carried out in zero debt companies and moderately leveraged companies across all sectors. A study can also be conducted in infrastructure, commercial, and residential real estate as well as in aviation that are all grappling with issues on payouts. Similarly, a comparison between large - cap, mid -cap, and small - cap companies can be carried out to establish that the size and scale of business also has a bearing on the decision to distribute profits.

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