

A Study on Determinants of Dividend Behaviour of Selected Banking Companies in India

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ARTICLE DETAILS

Article History

Published Online: 10 January 2018

Keywords

Dividend Pay-out, Lagged Dividend, Cash Flow, Depreciation and Net Profit after Tax.

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ABSTRACT

This study examines the Corporate Dividend Behaviour in the Indian context through Lintner's dividend model, Brittain's Cash Flow Model, Brittain's Explicit Depreciation model and the impact of a liquidity and leverage as determinants of dividend policy with profit after tax and depreciation. The study covers period of 15 years from 1998-99 to 2012-13. From the analysis, it can be concluded that profit after tax, lagged dividend and cash flow has significant impact on the dividend policy of Indian banking industry.

INTRODUCTION

Corporate dividend policy has long been an issue of interest in the financial literature and, despite the vast research on the topic, it remains an open subject. Ever since the work of John Lintner (1956), followed by the work of Miller and Modigliani (1961), dividend policy remains a controversial issue. In fact, this has been true since Miller and Modigliani's (1961) irrelevance proposition, according to them, dividend policies are all equivalent and there is no particular policy that can increase shareholders' wealth in perfect capital markets. One of the most critical arguments of financial literature has been dividend policy. Dividend decision has two important aspects; one is an effective element of long term financing decision and other one is maximization of wealth. On the one hand, the higher the dividend paid out, the lower will be corporations' internal resources for performing the investment projects, while outsourcing requirement will increase which is an effective element of the stock price. On the other hand, many corporate shareholders demand cash dividends. Thus, managers should always equilibrate between different interests of shareholders so that they could utilize investment profitable opportunities and would pay required cash dividends for some shareholders.

STATEMENT OF THE PROBLEM

Therefore, a dividend decision by corporations' managers is very sensitive and important as well. There is no doubt that when deciding about income, managers should consider their outcomes. That's why many corporations have a certain purpose in mind while making decisions about dividends. However, it is without question that when managers make dividend decisions they inevitably face constraints such as liquidity problems, tax considerations and so on. Listed corporations in the stock exchange use different advertising instruments for internal as well as external investment. One of these financial instruments is the dividend. On the one hand, dividends provide a stable income for shareholders who are able to regulate their life expenses with it, and on the other hand investors and stock buyers pay attention to corporations'

annual stock dividend news and reports. They give due attention to the fact that dividend represents corporations' power, while profit payment will cause shareholders to have confidence in their yield of capital receipt. Therefore, it is important to understand the factors that affect dividend policies and the managers making decisions about dividend policies in terms of these factors. Hence, in this chapter an attempt has been made to examine the factors influencing the dividend behaviour of the sample banks.

Research objective

The chapter is focused on the following objective:

- To identify the factors determining dividend behaviour of selected banking companies in India.

Research Hypotheses

In course of analysis, it is proposed to test the following hypotheses with help of the sample data

1. There is no significant impact of Profit after Tax on Dividend Payment.
2. There is no significant impact of Lagged Dividend on Dividend Payment.
3. There is no significant impact of Cash Flow on Dividend Payment.
4. There is no significant impact of Depreciation on Dividend Payment.
5. There is no significant impact of Liquidity on Dividend Payment.
6. There is no significant impact of Leverage on Dividend Payment.

RESEARCH METHODOLOGY

Sources of Data

The present study is mainly based on secondary data. It has been collected from PROWESS a database of CMIE and the annual report of RBI.

Period of Study

The study covers period of 15 years from 1998-99 to 2012-13.

Sampling design

The study is explorative in nature and based on secondary data. For the purpose of study, the population has been defined in terms of number of Scheduled Commercial banks which were registered and operating in India. The total number of banking companies falling under this category was 46. However, on further scrutiny banks are then selected for this study on the following criteria:

- a) The banks should have been listed on the National Stock Exchange of India and must be included in the SENSEX.
- b) The banks should have paid cash dividend regularly to its shareholders.
- c) The data must be available for the entire period of study.

On the basis of above criteria 24 banks were selected under Judgement Sampling method. Further the sample banks are classified into two groups based on the ownership viz, Public and Private Sector Banks. Finally, 13 banks from Public Sector and 11 banks from Private Sector have been selected as the sample for the present study. The name of the banking companies selected for the study is given below:

PUBLIC SECTOR BANKS		PRIVATE SECTOR BANKS	
1.	Allahabad Bank	1.	City Union Bank
2.	Andhra Bank	2.	Federal Bank
3.	Bank Of Baroda	3.	Karnataka Bank
4.	Bank Of India	4.	Jammu & Kashmir Bank
5.	Canara Bank	5.	Karur Vysya Bank
6.	Corporation Bank	6.	Lakshmi Vilas Bank
7.	Indian Overseas Bank	7.	South Indian Bank
8.	Oriental Bank Of Commerce	8.	Axis Bank
9.	Punjab National Bank	9.	HDFC Bank
10.	State Bank Of India	10.	ICICI Bank
11.	Syndicate Bank	11.	Kotak Mahindra Bank
12.	Union Bank Of India		
13.	Vijaya Bank		

MODEL SPECIFICATION

To answer the above research question, four econometric specifications were used to find out the determination of dividend policy in the sample banks with the help of some known dividend models. The regression models mainly relied in the present study is Lintner’s Model, Brittain’s Cash Flow Model, Brittain’s Explicit Depreciation Model. Based on these models, the present study attempts to examine, the impact of a liquidity and leverage as a determinants of dividend policy with profit after tax and depreciation with the help of the sample data.

Lintner’s Model – Model 1

Lintner’s model establishing the relationship between the current year dividend with current year profit and previous year dividend is as follows:

$$D_t = a_0 + a_1 P_t + a_2 D_{t-1} + U_t$$

Brittain’s Cash Flow Model – Model 2

Brittain’s cash flow model used in this study is a variant of Lintner’s model by use of Cash Flow, instead of profit after tax, as a measure of income. It can be expressed as

$$D_t = a_0 + a_1 C_t + a_2 D_{t-1} + U_t$$

Brittain’s Explicit Depreciation Model – Model 3

Brittain’s Explicit Depreciation Model incorporates depreciation as an additional explanatory variable in the basic Lintner’s Model.

$$D_t = a_0 + a_1 P_t + a_2 D_{t-1} + a_3 A_t + U_t$$

Dynamic Model – Model 4

In this extended model analyses the combined effect of Profit after tax, Depreciation furthermore, Liquidity and Leverage are also included in the model. Current year Dividend payment has been used as dependent variable.

The specification of the model is:

$$D_t = a_0 + a_1 P_t + a_2 A_t + a_3 LIQ_t + a_4 LEV_t + U_t$$

Where in all these equations:

- a_0 = Constant term
- D_t = Equity Dividend in period ‘t’
- P_t = Net Profit in a period of ‘t’
- D_{t-1} = Equity Dividend in period ‘t-1’
- C_t = Cash Flow in a period of ‘t’
- A_t = Amount of Depreciation in period ‘t’
- LIQ_t = Liquidity in period ‘t’
- LEV_t = Leverage in period ‘t’

U_t = Error term

REGRESSION ANALYSIS

The empirical studies disclose that Net Profit, Cash flow, Lagged Dividend, Depreciation, Liquidity and Leverage are expected to have a direct bearing on the dividend policy decision of the firms.

The four models of regression analysis has been done separately for all the selected banking companies for a period of 15 years from 1998-99 to 2012-13. The results of the empirical analysis are discussed below.

Lintner's Model – Model 1

The regression results of Lintner's Model for Public and Private sector banks have been presented in Table 1 and 2 respectively.

Table 1
Regression Results of Lintner's Model –Public Sector Banks
 Lintner's Model: $D_t = a_0 + a_1P + a_2D_{t-1} + U$

Name of the Bank	a_0	a_1	a_2	R^2	Adjusted R^2	F-Value	DW Statistics
ALB	7.055 (0.471)	0.158* (3.962)	0.295 (2.574)	93.1	91.9	80.488*	2.347
ANB	24.849** (2.233)	0.0626 (1.235)	0.747* (4.037)	96.3	95.6	154.115*	1.547
BOB	15.719 (0.500)	0.0737 (1.416)	0.733*** (2.069)	95.7	95.0	134.941*	2.561
BOI	-1.490 (0.053)	0.113* (4.433)	0.508** (2.937)	91.9	90.5	67.952*	1.751
CAB	27.513** (2.349)	0.0473* (3.315)	0.744* (7.648)	98.2	97.9	335.222*	1.895
COB	-2.148 (0.321)	0.200* (5.548)	0.182 (1.158)	98.8	98.6	487.582*	0.932
IOB	-6.196 (0.259)	0.160* (4.005)	0.453* (3.425)	86.5	84.3	38.476*	1.420
OBC	4.889 (0.271)	0.158* (3.669)	0.318 (1.593)	89.2	87.4	49.358*	1.986
PNB	-0.645 (0.012)	0.109 (1.214)	0.545 (1.181)	94.1	93.0	87.895*	1.964
SBI	-136.854* (3.084)	0.178* (8.195)	0.338* (3.325)	99.3	99.2	829.365*	1.816
SB	16.376*** (1.868)	0.262* (10.911)	-0.304*** (1.921)	98.4	98.1	328.560*	1.665
UBI	-0.270 (0.017)	0.0762** (2.759)	0.777* (5.866)	96.5	95.9	166.744*	2.255
VB	-38.491** (2.690)	0.367* (7.060)	0.330** (2.964)	94.5	93.4	86.007*	1.087

* Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level
 Figures in brackets denotes 't' values of the co-efficient.

The regression results of Lintner's dividend model for Public Sector banks are shown in Table 1. It is evident that the overall fit of the regression model measured by R^2 and F seems to be good in all the selected public sector banks. The coefficient of multiple determinations varies from 0.99 to 0.84. Thus about 99.2 per cent to 84 per cent of variations in Current Year Dividend are explained by the variables in Lintner's dividend equation. The F ratio is statistically significant at 1 per cent level in all the selected public sector banks.

The Durbin Watson statistic (DW) estimates for knowing the presence and absence of autocorrelation problem in the estimated equation also shows that in all the sample firms there is no autocorrelation problem as the DW value in all the sample firm are found to be between 1.547 to 2.561. But in the case of Corporation Bank there is an autocorrelation problem as the DW values are found to be less than 0.95

The regression co-efficient of both the explanatory variables net current earnings after tax (P_t) and dividend paid in the previous year (D_{t-1}) have the expected positive sign in all

the sample firms. The exogenous variable profit after tax has positive and significant relationship with dividend payment in most of the public sector banks except Andhra Bank, Bank of Baroda and Punjab National Bank. The other variable lagged dividend has a positive and significant relationship with dividend payment except Allahabad Bank, Corporation Bank, Oriental Bank of Commerce and Punjab National Bank.

It may be inferred from the above analysis that the specification of Lintner's dividend model offers satisfactory explanations of dividend behavior of selected public sector banks in India. That is to say, both the selected exogenous variables net current earnings after tax (P_t) and dividend paid in the previous year (P_{t-1}) well explained the dividend behaviour of selected public sector banks in India as explained by Lintner.

Table 2
Regression Results of Lintner's Model – Private sector Banks
Lintner's Model: $D_t = a_0 + a_1 P_t + a_2 D_{t-1} + U$

Name of the Bank	a_0	a_1	a_2	R^2	Adjusted R^2	F-Value	DW Statistics
CUB	3.588 (2.463)	0.130* (3.80)	0.237 (0.970)	97.0	96.5	192.476*	1.506
FB	-8.144 (1.230)	0.212* (3.598)	0.132 (0.490)	96.1	95.5	148.655*	1.971
JKB	-13.222 (2.544)	0.106* (3.468)	0.871* (5.648)	98.1	97.7	304.497*	1.306
KB	-7.109 (2.315)	0.176* (6.021)	0.557* (6.296)	97.4	97	226.484*	1.466
KVB	-15.902 (1.813)	0.298* (3.387)	0.220 (0.833)	94.8	93.9	109.431*	1.994
LVB	-3.955 (3.299)	0.309* (10.152)	0.270** (2.989)	96.8	96.2	153.662*	1.574
SIB	-1.139 (0.741)	0.103 (1.685)	0.691*** (0.862)	99.0	98.8	496.940*	2.060
AXB	22.881 (2.034)	0.190** (2.759)	-0.005 (0.013)	99.1	98.9	659.91*	0.858
HDFC	2.031 (0.594)	0.176* (5.189)	0.294 (1.671)	99.5	99.5	15576.317*	2.567
ICICI	48.687 (1.697)	0.241* (6.661)	0.298** (2.355)	99.3	99.2	898.195*	1.654
KMB	7.666 (2.296)	0.0203** (3.004)	0.506** (2.292)	91.2	89.7	61.867*	2.039

* Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level

Figures in brackets denotes 't' values of the co-efficient.

Table 2 reveals that the regression results of Lintner's dividend model for the private sector banks, It can be seen that the values of co-efficient of determination (R^2) ranges from 0.99 to 0.94 and the F statistics is significant at 1 per cent level in each sample unit and the results are encouraging in several aspects. Thus, 99 to 94 per cent of the variations in dividend payment are explained by the Current year profit after tax and previous year dividend. Hence, the regression as a whole is highly significant at 1 per cent level in all the selected private sector banks during the period under analysis.

The values of Durbin-Watson, the test applied to examine the existence of autocorrelation in the cross section data series, reveals that absence of auto correlation, since the calculated DW statistic greater than the critical value 1.54 at 5 per cent level except City Union Bank, Jammu and Kashmir Bank and Karnataka Bank in which the series was found inconclusive.

But in the case of Axis Bank there is an auto correlation problem as the DW values are found to be less than 0.95

The estimated regression co-efficient for the independent variable profit after tax is positive and statistically significant at 1 per cent level except South Indian Bank. Similarly the co-efficient of lagged dividend positively associated with dividend payment and which is having a significant impact on the dividend payment of Jammu and Kashmir Bank, Karnataka Bank, Lakshmi Vilas Bank, South Indian Bank, ICICI Bank, and Kotak Mahindra Bank. The co-efficient of variations are in the predicted right direction and highly significant.

The empirical results shows that the current year dividend is an increasing functions of Profit after Tax and previous year dividend, Further it is also found that dividend changes basically depend on the profit after tax, it encourages the banks to change dividend policy.

Brittain's Cash flow Model – Model 2

The regression results of Public Sector Banks and Private Sector Banks as per Brittain's cash flow model has been presented in Table 3 and Table 4.

Table 3
Regression Results of Brittain's Cash flow Model – Public Sector Banks

$$\text{Brittain's Cashflow Model: } Dt = a_0 + a_1 C_t + a_2 D_{t-1} + U$$

Name of the Bank	a_0	a_1	a_2	R^2	Adjusted R^2	F-Value	DW Statistics
ALB	3.525 (0.231)	0.156* (3.986)	0.285 (1.510)	93.1	92	81.088*	2.331
ANB	23.004 (2.076)	0.069 (1.481)	0.707* (3.877)	96.4	95.8	162.031*	1.526
BOB	11.902 (0.401)	0.075 (1.556)	0.695*** (1.999)	95.9	95.2	139.125*	2.586
BOI	-8.028 (0.289)	0.114* (4.558)	0.480** (2.761)	92.2	90.9	70.588*	1.783
CAB	16.538 (1.079)	0.037*** (1.997)	0.850* (7.109)	97.8	97.4	267.864*	2.318
COB	-7.606 (1.041)	0.196* (5.435)	0.166 (1.014)	98.7	98.5	473.340*	0.903
IOB	-10.589 (0.438)	0.160* (4.084)	0.412* (3.013)	86.8	84.6	39.494*	1.428
OBC	0.793 (0.043)	0.151* (3.587)	0.309 (1.506)	88.9	87.1	48.068*	1.993
PNB	-7.890 (0.153)	0.104 (1.335)	0.545 (1.302)	94.6	93.7	105.473*	1.969
SBI	-195.472 (3.683)	0.170* (7.429)	0.324** (2.855)	99.2	99	703.175*	1.528
SB	13.272 (1.334)	0.260* (9.413)	-0.383*** (2.009)	97.9	97.5	250.366*	1.406
UBI	-2.234 (0.135)	0.071** (2.718)	0.777* (5.800)	96.5	95.9	164.760*	2.248
VB	-32.787** (2.734)	0.327* (6.931)	0.324** (2.840)	94.6	93.7	104.299	0.955

* Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level
Figures in brackets denotes 't' values of the co-efficient.

The regression estimates of Brittain Cash flow model for the public sector banks are depicted in table 3. It is observed from the above table that the coefficient of determination of R^2 is statistically significant in all the selected public sector banks at 1 per cent level of significance as is depicted from their 'F' values. It indicates that the estimated regression model with explanatory variables is fitted significantly. The value of adjusted R^2 ranges from 0.99 to 0.84. Thus 99 to 84 per cent of variations in dividend payment are explained by the Cash flow and Lagged dividend.

The values of DW statistics reveals that absence of autocorrelation in Allahabad bank, Bank of Baroda, Bank of India, Canara Bank, Oriental Bank of Commerce, Punjab National Bank and Union Bank of India, since the DW values are greater than the critical value of 1.54 at 5 per cent level. In case of Corporation Bank, there is autocorrelation problem as the DW value was found to be less than 0.95. Whereas, in case of Andhra Bank, Indian Overseas Bank, State Bank of India,

Syndicate Bank and Vijaya Bank, the DW Series were found inconclusive.

The regression co-efficient of both the explanatory variables cash flow (C_t) and dividend paid in the previous year (D_{t-1}) have the expected positive sign in all the sample banks. The independent variable cash flow has a positive and significant relationship with dividend payment in most of the cases except Andhra Bank, Bank of Baroda, and Punjab National Bank, Similarly, the other independent variable lagged dividend also has a positive and significant relationship with dividend payment except Allahabad Bank, Corporation Bank, Oriental Bank of Commerce and Punjab National Bank.

From the analysis, it can be concluded that the cash flow and previous year dividend have significant impact on the dividend behavior of most of the sample firms. Both the variables of the Brittain Cash flow model causes more than 84 per cent of the variation in the dividend payment of the public

sector banks. F value also indicates that cash flow and lagged dividend are the important determinants of dividend.

Table 4
Regression Results of Brittain's Cash flow Model – Private Sector Banks

Brittain's Cashflow Model : $D_t = a_0 + a_1 C_t + a_2 D_{t-1} + U$

Name of the Bank	a_0	a_1	a_2	R^2	Adjusted R^2	F-Value	DW Statistics
CUB	3.201 (2.290)	0.117* (3.871)	0.274 (1.189)	97.0	96.5	196.598	1.600
FB	-12.023 (1.665)	0.212* (3.701)	0.066 (0.240)	96.2	95.6	153.344*	1.896
JKB	-15.201 (2.689)	0.104* (3.297)	0.865* (5.283)	98.0	97.6	289.499*	1.260
KB	-8.342 (2.480)	0.168* (5.714)	0.551* (5.894)	97.2	96.7	209.125*	1.440
KVB	-19.207 (2.023)	0.295* (3.436)	0.167 (0.605)	94.9	94.0	111.061*	1.962
LVB	-4.464 (3.661)	0.272* (10.238)	0.188*** (1.973)	96.9	96.3	156.113*	1.718
SIB	-1.256 (0.806)	0.091 (1.655)	0.719*** (1.990)	99.0	98.8	493.063*	2.056
AXB	14.881 (1.433)	0.204* (3.3196)	-0.189 (0.446)	99.2	99.1	775.59*	1.060
HDFC	-5.133 (1.108)	0.104* (4.255)	0.656* (4.208)	99.9	99.9	10223.838*	2.601
ICICI	-12.759 (0.586)	0.253* (10.072)	0.198*** (2.109)	99.7	99.6	1813.735*	1.488
KMB	7.282 (2.189)	0.0183** (2.911)	0.512** (2.279)	90.9	89.4	60.090*	2.026

* Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level
Figures in brackets denotes 't' values of the co-efficient.

Table 4 shows the regression results of Brittain Cash flow model for the Private sector banks. It is apparent from the above table that the Brittain's Cash Flow model fitted significantly at 1 per cent level in all the selected private sector banks. The co-efficient of multiple determinations varies from 0.99 to 0.90. Thus about 99.9 per cent to 90.9 per cent of variations in Current Year Dividend are explained by the variables in Brittain Cash flow model. The F ratio is statistically significant at 1 per cent level in all the selected private sector banks.

The Durbin Watson statistic (DW) estimates for knowing the presence and absence of autocorrelation problem in the estimated equation also shows that in the case of City Union Bank, Federal Bank, Karur Vysya Bank, Lakshmi Vilas Bank, South India Bank, HDFC Bank and Kotak Mahindra Bank there is no autocorrelation problem as the DW value in those sample firm are found to be between 1.600 to 2.601. But in the

case of Jammu & Kashmir Bank, Karnataka Bank, Axis Bank and ICICI Bank the DW series was found inconclusive.

The regression co-efficient of both the explanatory Cash flow (C_t) and dividend paid in the previous year (D_{t-1}) have the expected positive sign in all the sample banks. The exogenous variable cash flow has a positive and significant relationship with dividend payment in all the selected banks except South Indian Bank. The other variable lagged dividend has a positive and significant relationship with dividend payout except City Union Bank, Federal Bank, Karur Vysya Bank and Axis Bank.

It can be concluded from the above analysis that the specification of Brittain Cash flow model offers satisfactory explanations of dividend behavior of selected Private sector banks in India. The both selected exogenous variables cash flow (C_t) and dividend paid in the previous year (P_{t-1}) explained 90.9 to 99.9 per cent of variations in the current year dividend payment.

Brittain's Explicit Depreciation Model – Model 3

The regression results of Brittain's Explicit Depreciation model for Public and Private sector banks have been disclosed in Table 5 and Table 6

Table 5
Regression Results of Britain's Explicit Depreciation Model – Public Sector Banks
 Britain's Explicit Depreciation Model : $D_t = a_0 + a_1P + a_2D_{t-1} + a_3A + U$

Name of the Bank	a_0	a_1	a_2	a_3	R^2	Adjusted R^2	F-Value	DW Statistics
ALB	-6.008 (0.169)	0.148** (3.029)	0.263 (1.252)	0.584 (0.408)	93.2	91.3	49.987*	2.273
ANB	-2.610 (0.226)	-0.007 (0.166)	0.675* (4.914)	1.358* (3.367)	98.2	97.7	195.044*	2.050
BOB	-15.279 (0.361)	0.053 (0.964)	0.725*** (2.061)	0.450 (1.084)	96.2	95.1	91.658*	2.590
BOI	-53.251 (1.153)	0.114* (4.627)	0.330 (1.568)	0.921 (1.384)	93.1	91.2	49.399*	1.965
CAB	-43.697 (1.131)	0.043** (2.458)	0.661* (4.175)	0.807 (1.757)	98.3	97.8	206.527*	2.243
COB	-2.871 (0.258)	0.199* (5.302)	0.179 (1.053)	0.024 (0.084)	98.8	98.5	298.158*	0.930
IOB	-39.387 (1.028)	0.148* (3.597)	0.137 (0.435)	1.333 (1.101)	87.8	84.5	26.511*	1.570
OBC	13.781 (0.517)	0.169* (3.351)	0.351 (1.608)	-0.309 (0.467)	89.4	86.5	30.835*	1.981
PNB	-43.526 (0.525)	0.055 (0.463)	0.688 (1.330)	0.603 (0.684)	94.4	92.7	55.914*	2.120
SBI	-0.263 (0.003)	0.187* (8.574)	0.400* (3.749)	-0.373 (1.431)	99.4	99.2	601.898*	2.427
SB	18.219 (1.982)	0.260* (10.608)	-0.225 (1.199)	-0.182 (0.811)	98.5	98	212.427*	1.817
UBI	28.268 (0.834)	0.129*** (2.092)	0.813* (5.884)	-0.985 (0.956)	96.8	95.9	110.661*	2.387
VB	-13.127 (0.689)	0.370* (6.543)	0.351** (3.112)	-0.772 (0.915)	95.3	94.0	74.163*	1.171

* Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level
 Figures in brackets denotes 't' values of the co-efficient.

This model incorporates depreciation as an additional explanatory variable in the basic Lintner's model. A perusal of results of this model for public sector banks was displayed in table 5. The model with all explanatory variable was fitted significantly at 1 per cent level as depicted from their F values and the value of Adjusted R² implies that 99.2 to 84.5 per cent of variations in current year dividend payment are explained by the current year profit, lagged dividend and depreciation. Hence, the regression as a whole is highly significant at 1 per cent level in all the selected public Sector Banks.

The explanatory variable profit after tax a the positive sign and significant relationship with dividend payment in all the sample public sector banks except Andhra Bank, Bank of Baroda and Punjab National Bank. The other explanatory variable lagged dividend was found positive and significant relationship in the case of Andhra Bank, Bank of Baroda, Canara Bank, State Bank of India, Union Bank of India and Vijaya bank. In rest of the banks, the co-efficient of the lagged dividend was found statistically insignificant. The co-efficient of exogenous variable Depreciation have a positive and

significant relationship in the case Andhra Bank only. In all other cases depreciation does not have a significant relationship with dividend payment.

Further the DW results shows that the absence of autocorrelation since the calculated DW statistic greater than the critical value 1.75 at 5 per cent level except Corporation Bank, Indian Overseas Bank and Vijaya Bank in which the series was found inconclusive. Hence, the results of the model give reliable estimates.

It may be inferred from this above observations that the specification of Britain's Explicit Depreciation Model offers Satisfactory explanation of dividend behavior in all the selected public sector banks in the present study and also it is found from the analysis profit after tax was the most important determination of for the dividend decision of the selected Public sector banks than lagged dividend. Depreciation does not have any impact on dividend decision of the selected public sector banks in the present study.

Table 6
Regression Results of Brittain's Explicit Depreciation Model – Private Sector Banks
 Brittain's Explicit Depreciation Model : $D_t = a_0 + a_1 P + a_2 D_{t-1} + a_3 A + U$

Name of the Bank	a_0	a_1	a_2	a_3	R^2	Adjusted R^2	F-Value	DW Statistics
CUB	3.172 (1.824)	0.116** (2.552)	0.278 (1.042)	0.126 (0.479)	97.0	96.2	120.154*	1.609
FB	-19.927 (1.239)	0.206* (3.407)	-0.041 (0.121)	0.676 (0.806)	96.3	95.3	96.429*	1.800
JKB	-5.180 (0.532)	0.103* (3.355)	0.948* (5.469)	-0.377 (0.977)	98.2	97.7	202.558*	1.456
KB	1.210 (0.218)	0.210* (6.308)	0.625* (6.896)	-0.986 (7.746)	98.0	97.4	177.796*	1.642
KVB	-19.810 (1.492)	0.293* (3.183)	0.155 (0.487)	0.377 (0.404)	94.9	93.5	67.920*	1.953
LVB	-4.262 (3.221)	0.290* (6.677)	0.222*** (1.876)	0.151 (0.647)	97.0	96.0	96.629*	1.670
SIB	-0.907 (0.473)	0.120 (1.188)	0.659 (1.589)	-0.169 (0.225)	99.0	98.7	299.861*	2.072
AXB	-3.873 (0.242)	0.181** (2.984)	-0.240 (0.591)	0.655*** (2.124)	99.4	99.2	570.19*	1.552
HDFC	14.019 (2.253)	0.260* (5.601)	-0.098 (0.416)	-0.171*** (2.195)	99.8	99.8	13687.864*	2.407
ICICI	-13.14 (0.468)	0.253* (9.412)	0.198*** (2.019)	0.255* (3.338)	99.7	99.6	1108.448*	1.483
KMB	8.842 (2.388)	0.0279** (2.423)	0.528** (2.338)	-0.0827 (0.792)	91.6	89.4	40.172*	2.121

* Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level
 Figures in brackets denotes 't' values of the co-efficient.

The table 6 reveals that the regression results of Brittain's Explicit Depreciation model for the private sector banks. In this model along with lagged dividend Brittain uses net profit and depreciation as the separate explanatory variables rather than the combined form of "Cash flow". The result of this model reveals that Adjusted R2 is statistically significant at 1 per cent level in all the selected private sector banks as is depicted from their 'F' values. The value of Adjusted R2 is more than 89.4 per cent in all the selected private sector banks. It shows that to a significant extent the regression equation of Brittain's Explicit Depreciation model explains well about the dividend behavior of the selected private sector banks.

The regression co efficient of the explanatory variable profit after tax have the appropriate positive sign in all the selected private sector banks and also found to be statistically significant in all the banks except South Indian Bank. The other explanatory variable lagged dividend positively associate with current year dividend payment except Federal Bank, Axis Bank

and HDFC Bank. The lagged dividend was found to be an important determinant of dividend payment in the case of Jammu & Kashmir Bank, Karnataka Bank, Karur Vysya Bank, Lakshmi Vilas Bank, ICICI Bank and Kotak Mahindra Bank. The other variable Depreciation has a significant impact on dividend payment in the case of Axis Bank, HDFC Bank and ICICI Bank. Further the DW results disclose that in the case of Federal Bank, Karur Vysya Bank, South Indian Bank, HDFC Bank and Kotak Mahindra Bank there is no auto correlation problem as the DW values were greater than the critical value of 1.75. In case of other Banks DW was found inconclusive since the values were in between the critical value of 0.82 to 1.75.

The result reveals that the profit after tax was the most important consideration for dividend payment in all the selected private sector banks, and also it would imply that the explanatory variable depreciation has no influence on dividend payment in most of the selected banks during the study period.

Dynamic Model – Model 4

The Table 7 and Table 8 show that the regression results of Dynamic Panel Model for Public and Private sector banks respectively.

Table – 7
Regression Results of Dynamic Model - Public Sector Banks

$$D_t = a_0 + a_1P_t + a_2A_t + a_3LIQ_t + a_4LEV_t + U_t$$

Name of the Bank	a ₀	a ₁	a ₂	a ₃	a ₄	R ²	Adjusted R ²	F-Value	DW Statistics
ALB	-76.298 (0.442)	0.166** (2.854)	1.359 (0.820)	2.653 (0.098)	841.011 (0.454)	92.4	89.3	30.182*	1.903
ANB	200.796 (6.550)	0.148* (6.693)	2.982* (8.479)	-22.028* (5.020)	-2606.63* (7.329)	99.1	98.7	269.914*	2.383
BOB	15.182 (0.081)	0.143* (3.638)	0.504 (0.986)	10.633 (0.41)	-373.113 (0.184)	94.8	92.7	45.693*	2.153
BOI	-186.896 (1.103)	0.115* (6.070)	1.103** (2.236)	65.285** (2.739)	-362.009 (0.273)	95.3	93.4	50.425*	1.863
CAB	-278.859 (2.199)	0.082* (3.600)	2.894* (4.317)	27.178 (1.614)	-375.685 (-0.277)	96.4	95.0	67.472*	1.317
COB	-41.779 (1.020)	0.232* (9.994)	0.072 (0.182)	1.295 (0.140)	349.275 (1.178)	98.8	98.4	210.482*	0.911
IOB	-165.093 (2.184)	0.143* (2.886)	0.997 (1.470)	21.909 (1.319)	1111.142 (1.111)	90.3	86.5	23.378*	1.388
OBC	76.966 (0.696)	0.197* (4.048)	0.123 (0.173)	-12.199 (0.968)	-205.965 (0.164)	88.4	83.8	19.129*	0.863
PNB	123.475 (0.550)	0.210* (5.482)	0.614 (0.784)	25.628 (0.535)	-3600.298 (1.577)	95.2	93.3	49.475*	1.362
SBI	1515.977 (2.985)	0.194* (9.049)	0.806** (2.522)	367.909* (3.086)	2818.874 (1.122)	99.4	99.2	436.305*	1.692
SB	26.525 (0.963)	0.232* (17.101)	-0.077 (0.356)	-11.98*** (2.190)	189.551 (0.626)	98.6	98.1	178.628*	2.521
UBI	-109.989 (0.585)	0.203 (1.427)	0.094 (0.040)	3.737 (0.150)	1333.506 (0.838)	88.3	83.6	18.846*	0.730
VB	-71.927 (1.142)	0.475* (8.715)	0.155 (0.167)	16.385** (2.224)	-487.627 (0.800)	94.8	92.7	45.363*	1.764

* Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level
 Figures in brackets denotes 't' values of the co-efficient.

Table 7 reveals the results of estimated regression model for the public sector banks. It can be seen that the values of adjusted R² ranges from 0.83 to 0.99 and significant at 1% level. This indicates that all the independent variables together have a significant influence on the dividend behaviour of the select public sector banks.

Further the DW results shows that in the case of the Andhra bank, Bank of Baroda and Syndicate bank, there is no auto correlation problem as the DW value of those firms are greater than the critical value 1.977 at 5 per cent level. But in other banks the DW series are found inconclusive, since the calculated value of DW statistic are found in between the critical values of 0.69 to 1.97 at 5 per cent level. Hence, the results of the model give reliable estimates.

The co-efficient for the independent variable profit after tax shows the predicted sign and significant in all the banks except Union Bank of India, which imply positive relation between dividend and profit after tax. The result suggests that the Profit after tax has high impact on dividend payment of Public Sector banks.

The regression co-efficient of the depreciation has obtained positive values in all the banks except Syndicate bank which

imply a positive relationship between dividend and depreciation. The positive co-efficient of the depreciation signifies the ability of the banks under study to stick to the predetermined dividend commitment has strengthened because of large depreciation amount. However, depreciation has resulted as the most important determinant in case of Andhra bank, Bank of India, Canara bank and state Bank of India. In all other cases depreciation does not have significant impact on dividend policy.

The result also shows that liquidity has a positive relationship with ten public sector banks which consistent with Ali, et al. (1993), Mohamed, et al. (2006). It is indicating that a higher level of liquid assets reduces the likelihood to pay dividend. However, the liquidity was found to be an important determinant of dividend payment only in the cases of Bank of India, State Bank of India and Vijaya bank. The results of table suggest that liquidity does not have a significant impact on dividend policy of public sector banks.

Leverage is negatively related with dividend payment in the seven banks out of thirteen banks such as Andhra Bank, Bank of Baroda, Bank of India, Canara Bank, Oriental Bank of Commerce, Punjab National Bank and Vijaya Bank which is in line with Ahmad and Attiya (2009) but contradicts the results

Mayer and Frank (2004) who reported positive relationship of leverage on dividend payment. However the relationship was found significant only in the case Andhra bank, therefore, debt cannot be considered as an important determinant on the dividend policy of selected public sector banks.

From the analysis, it can be concluded that all the four factors jointly well explained the dividend behaviour of Public

Sector banks, however, the most significant factor that influenced the dividend behaviour of Public sector banks turned out to be profit after tax. The other variable, liquidity is not the deciding factor of dividend rate in most of the public sector banks. The explanatory variable leverage also does not have any significant impact on the dividend decision of the public sector banks except Andhra bank.

Table 8
Regression Results of Dynamic Model - Private Sector Banks

$$D_t = a_0 + a_1P_t + a_2A_t + a_3LIQ_t + a_4LEV_t + U_t$$

Name of the Bank	a ₀	a ₁	a ₂	a ₃	a ₄	R ²	Adjusted R ²	F-Value	DW Statistics
CUB	15.579 (3.336)	0.147* (9.520)	0.011 (0.054)	0.309 (0.344)	-202.08** (3.005)	98.3	97.6	144.222*	2.077
FB	-12.901 (0.409)	0.196* (3.899)	0.657 (0.926)	-1.277 (0.396)	-1.994 (0.007)	96.4	95.0	67.456*	1.970
JKB	-73.510 (2.324)	0.291* (4.505)	2.648 (1.659)	5.056*** (1.812)	3.681 (0.009)	62.1	88.9	29.070*	1.015
KB	-128.952 (1.563)	0.250* (8.592)	1.731 (1.415)	1.814 (0.314)	1076.587 (1.164)	94.3	92.0	41.015*	1.348
KVB	-17.166 (0.745)	0.291* (3.872)	1.091 (1.042)	1.869 (0.796)	-220.066 (0.941)	95.3	93.4	50.436*	1.808
LVB	-4.998 (0.977)	0.280* (6.061)	0.458*** (2.050)	0.252 (0.398)	-9.854 (0.176)	96.2	94.6	62.814	1.467
SIB	-8.344 (0.977)	0.202* (7.117)	0.165 (0.447)	1.435 (1.056)	24.464 (0.217)	98.8	98.3	203.342*	1.766
AXB	14.169 (0.183)	0.150* (6.088)	0.556 (1.556)	-1.340 (0.348)	-47.302 (0.109)	99.3	99.1	381.380*	1.522
HDFC	4.418 (0.094)	0.239* (25.908)	-0.131 (1.192)	-3.123 (0.461)	63.764 (0.382)	99.9	99.9	10091.42*	2.942
ICICI	-239.974 (2.135)	0.305* (41.474)	0.461* (4.460)	26.74*** (2.140)	197.978 (1.272)	99.8	99.7	814.437*	1.583
KMB	28.553 (5.596)	0.045* (4.747)	-0.148 (1.507)	-2.520 (2.644)	-16.373 (1.864)	93.8	91.3	37.927*	1.505

* Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level
Figures in brackets denotes 't' values of the co-efficient.

Table 8 reveals the estimated regression results for the private sector banks. The multiple regression model with dividend payment as dependent variable has co-efficient of determination adjusted for degrees of freedom (adjusted R²) from 88.9 to 99.8 per cent. This signifies that 88.9 to 99.8 per cent of variations in dividend payment are explained by all the explanatory variables. The F values of the overall model are found to be significant at 1 per cent level, showing the applicability of overall model.

Further the DW Statistics are found inconclusive in all the selected private sector banks except City Union Bank and HDFC Bank since the calculated value of DW statistic are found in between the critical values of 0.69 to 1.97 at 5 per cent level. In the case of City Union Bank and HDFC Bank there is an absence of auto correlation as the DW value is greater than the critical value 1.97 at 5 per cent level.

The co-efficient of profit after tax has positive and significant relationship with dividend payment at 1 per cent

level in all the selected Private Sector Banks. Like earlier studies, the study also concludes that higher the profit the company pays more dividend. This study clearly indicates that profit after tax is the most significant variable influencing the dividend payment of private sector banks.

The explanatory variable depreciation is positively related with dividend payment of all the selected private sector banks except HDFC Bank and Kotak Mahindra Bank, which indicates that the firm charging more depreciation pays higher dividend. The depreciation positively related with dividend payment but the results are not statistically significant except Lakshmi Vilas Bank and ICICI Bank.

The other variable Liquidity has both positive and negative relationship with dividend payment in the Private Sector banks. The co-efficient of liquidity positive relation with 7 banks viz. City Union Bank, Jammu & Kashmir Bank, Karnataka Bank, Karur Vysya Bank, Lakshmi Vilas Bank, South Indian Bank and ICICI Bank indicating that a higher level of liquidity

likelihood to pay more dividend. In the case of Federal Bank, Axis Bank, HDFC Bank and Kotak Mahindra Bank, the explanatory variable liquidity has a negative relationship dividend payment signifies that the poor liquidity position of these four banks, the dividend payment has not been constrained. The liquidity has an insignificant relationship with dividend payment except Jammu & Kashmir Bank and ICICI Bank, it is concluded that liquidity does not have significant impact on the dividend decision of Private Sector Banks.

Leverage is negative and insignificantly related with dividend payment showing lesser importance of debt ratio in determining dividend payment which is in line with the results reported by Baker et al.(2007) and Ahmad and Attiya (2009) who reported that high levered firm are more reluctant to pay high dividend as compared to low levered firms. But in five banks viz. Jammu & Kashmir Bank, Karnataka Bank, South Indian Bank, HDFC Bank and ICICI Bank, the leverage has a positive relationship with dividend payment but statistically insignificant. The insignificant relationship between leverage and dividend payment indicates that debt cannot be considered as an important determinants on the dividend policy of private sector banks.

Hence it is concluded that all the selected variables were taken together significantly affecting the dividend payment of all the private sector banks and the profit after tax was the most important factor influencing the dividend behaviour of private sector banks. The explanatory variable depreciation was another important factor to determine the dividend behaviour of private sector banks. However, the explanatory variable liquidity was an important determinant of dividend decision only in the case of Jammu & Kashmir bank and ICICI bank. It is also found that Leverage has not been found important determinants of dividend behaviour.

TESTING OF HYPOTHESES

Ho: There is no significant impact of Profit after Tax on dividend payment.

This hypothesis was examined in the present study with the help of sample data. In analyzing the data, it was found that the regression co-efficient of the explanatory variable profit after tax had the expected positive sign in all the banks and were found statistically significant. It was inferred from the analysis, profit after tax had a significant impact on the dividend payment. Hence, the hypothesis is rejected.

Ho: There is no significant impact of Lagged Dividend on Dividend payment.

It is evident from the regression results that the co-efficient of lagged dividend was found to be positive except Syndicate bank and Axis bank. However, the findings indicated that the lagged dividend has a positive effect on the dividend payment of banks. From the analysis, it is observed that the relationship was found statistically significant in all the banks except Allahabad bank, Corporation bank, Oriental Bank of Commerce, Punjab National bank, City Union Bank, Federal Bank, Karur Vysya bank and Axis bank, hence the hypothesis is hold good in these banks. In rest of the banks the hypothesis is not holding good.

Ho: There is no significant impact of Cash Flow on Dividend Payment.

This hypothesis was examined by using the regression analysis. It was evident from the regression results that co-efficient of Cash flow had the appropriate positive sign in all the banks and was found statistically significant except Andhra Bank, Bank of Baroda, Punjab National bank and south Indian bank. The above results thus disclosed that the hypothesis stands valid in Andhra bank, Bank of Baroda, Punjab National bank and South Indian bank. The hypothesis stands invalid in rest of the cases.

Ho: There is no significant impact of Depreciation on Dividend Payment.

It is evident from the regression results that the explanatory variable depreciation has significant relationship with dividend payment in Andhra bank, Bank of India, Canara bank, State Bank of India, Lakshmi Vilas bank, Axis Bank, HDFC bank and ICICI bank. Thus, it was inferred that depreciation had an impact on dividend payment of these banks. In case of other banks the hypothesis is hold good.

Ho: There is no significant impact of Liquidity on Dividend Payment.

This hypothesis was examined in the present study by taking the liquidity as an additional explanatory variable in the regression model for all the banks. It is evident from the results that the liquidity of the banks has a significant impact on dividend decision of Andhra bank, Bank of India, State Bank of India, Syndicate bank, Vijaya bank, Jammu & Kashmir bank and ICICI bank. The above results disclosed that the hypothesis stands invalid in these banks. For all other banks, liquidity does not have significant impact in dividend payment hence, the hypothesis stands valid.

Ho: There is no significant impact of Leverage on Dividend Payment.

A perusal of the regression results of the inclusion of leverage as an additional explanatory variable in the regression model revealed that, its co-efficient was statistically significant and improved the explanatory power of model in the case of Andhra bank and City Union bank. In rest of the banks the co-efficient was found to be statistically insignificant. Thus, it was inferred that leverage was found helpful in explaining the dividend behaviour of Andhra bank and City Union Bank in the present study. In rest of the banks, the hypothesis is accepted.

CONCLUSION

In the present study an attempt has been made to examine applicability of established dividend models given by Lintner and Brittain in 1956 and 1966 respectively and the extended model with inclusion liquidity and leverage with profit after tax and depreciation. This study concluded that Lintner's model well explained the explanatory power of the profit after tax and lagged dividend. The cash flow model also given the same conclusion as that of Lintner's dividend theory. Cash flow has turned out to be a significant variable in dividend decision process of most of the Indian banks. But, the depreciation could not have significant impact on the dividend decision, in most of the banks it is found with insignificant co-efficient. As per dynamic model inclusion of liquidity and leverage could not bring significant improvement in the explanatory power of regression equation under use and does not have significant impact on dividend decision of private and public sector banks.

From the analysis it is found that Lintner's hypothesis regarding the positive effect of profit after tax and lagged dividend in firms' dividend policy is still found true in India. The results of the study also give sufficient support to the

Brittain's Cash Flow model. In a nutshell, It can be concluded that profit after tax, lagged dividend and cash flow has significant impact on the dividend policy of Indian banking industry.

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