CHAPTER – 5

DATA ANALYSIS AND FINDINGS

DATA ANALYSIS AND FINDINGS

This chapter presents the most vital part of this research. The chapter contains the empirical results of both descriptive statistics and inferential statistics. The chapter presents a very comprehensive summary statistics table which helps us to understand the basic data property like central tendency and dispersion of the variables used in this research. The descriptive statistics include the means, standard deviation values, minimum values and maximum values of all the variables under consideration. From the mean values of variables we can understand the average quantitative position of the Indian manufacturing companies in respect to that variable. The standard deviation value would indicate the degree of dispersion or deviation among the companies in respect to the values of a particular variable. The minimum and maximum values would show the range on which the value of a variable is laying.

Now, after estimating the descriptive statistics, the study before proceeding to the panel data estimation, check for multicllinearity and heteroskedasicity as the diagnostic test. Finally, the nature and degree of empirical relationship between capital structure, ownership structure and corporate performance is examined through inferential statistics. Regarding inferential statistics, the study applies static and dynamic panel data model to arrive at the results. The application of dynamic panel estimation under GMM framework is highly expected to ensure the reliability and robustness of the results that the study would obtain. Besides, the mainstream analysis, the study at last carries out an additional or extended analysis introducing a new independent variable of ownership structure i.e. largest ownership and test the non-linear effect of this variable on the performance measures of the study.

5.1 Descriptive Statistics

Table 5.1 represents the descriptive statistics of the variables included in the regression models. The mean debt to equity ratio of Indian manufacturing firms is found to be 0.54. It means the owners' capital in these firms on an average is two times of their debt capital. However, the deviation in debt to equity ratio is not very high which indicates the magnitude of financial leverage among Indian manufacturing firms is not so dispersed. Among the different kinds of shareholders, the average domestic promoters' shareholdings in Indian manufacturing firms is found to be highest i.e. 45.22 percent. The maximum ownership by domestic promoters is found to be 90.40 signifying the dominance of large promoters in the ownership of Indian manufacturing firms. However, the average shareholding by foreign promoters in the firms is found to be 2.92 with a maximum value of 39.70. Therefore, on an average the ownership interest of foreign promoters in Indian manufacturing companies is seen to be not so high. The average percentage of shareholding held by institutional investors is 27.74 implying considerable participation of banks, insurance, mutual funds etc. companies on the equity ownership of such firms. The mean value of ownership concentration measured by using HHI is 0.14 which indicates a moderate level of ownership concentration. However, we find a standard deviation of 0.12 and the maximum value of 0.54 which indicate the level of concentration highly varies across the firms.

Considering the performance dimension of Indian firms, the researcher observes that the average accounting performance of Indian firms is good enough as the mean values of ROA and ROE are found to be 9.88 and 20.88 percent respectively. More specifically, it represents the capacity of the sampled firms in wisely using its assets and equity capital respectively. The mean TQ is found to be 2.38 percent which

indicates that the market value of Indian manufacturing firms on an average is more than two times of their book value. Besides, the mean MBVR of 4.64 also implies good market performance of such firms.

Table 5.1: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
CS	0.54	0.58	0.00	3.25
ODP	45.22	23.37	0.00	90.40
OFP	2.92	8.31	0.00	39.70
OIIN	27.74	11.62	3.03	53.15
OWN_CON	0.14	0.12	0.004	0.54
AGE	39.91	20.06	1.00	92.00
LQDT	1.45	1.63	0.13	22.41
AUE	1.01	0.58	0.02	2.52
FS	8.81	1.26	5.92	11.73
ROA	9.88	6.95	-9.51	30.66
ROE	20.88	17.84	-80.31	114.58
TQ	2.38	1.89	0.35	10.61
MBVR	4.64	4.57	0.26	31.14

Source: Calculated by Researcher

5.2 Diagnostic Tests

The presence of multicollinearity property among the variables can produce erroneous result and lead to spurious inferences. The study introduces pair-wise correlation matrix and variance inflation factor (Table 5.2) to check the presence of multicollinearity. The pair-wise correlations and maximum value of VIF both suggests that the explanatory variables used in this study are free form multicollinearity. The correlations are found to be very low and even insignificant for

some pairs of variables whereas the maximum VIF value is found to be 3.65. As we know that, there is no such commonly agreed criterion for determining the bottom line of the tolerance value of VIF but Gujarati (2004) suggests that, explanatory variables can be regarded as highly collinear if the VIF value exceeds ten.

Table 5.2: Pair-wise Correlation Matrix and Variance Inflation Factor

Ind Var	CS	ODP	OFP	OIIN	OWN_ CON	AGE	LQD T	AUE	FS	VIF
CS	1.00									1.43
ODP	-0.0004	1.00								3.65
OFP	-0.009	-0.36*	1.00							2.24
OIIN	-0.052	-0.51*	-0.15*	1.00						2.67
OWN_ CON	-0.12*	0.23*	-0.005	-0.25	1.00					1.69
AGE	-0.16*	-0.16*	-0.03	0.13	-0.03	1.00				1.12
LQDT	-0.19*	0.09**	-0.04	0.05	0.15*	-0.04	1.00			1.16
AUE	-0.03	-0.19*	0.27*	-0.11	-0.03	0.06	-0.23*	1.00		1.29
FS	0.19*	-0.08*	-0.14*	0.24	0.09**	-0.01	-0.02	-0.33*	1.00	1.54

Note: * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance

Source: Calculated by Researcher

Besides, the classical regression model assumes that the modelling errors or error terms are uncorrelated and uniform and the variance of such error terms is constant, which fits under a condition of homoskedasticity. Now, when the error terms do not have constant variance, they are said to be heteroskedastic and the existence of this problem is a serious concern in the application of regression analysis as it can invalidate statistical tests of significance. Therefore, regarding the heteroskedasticity, the study introduces two tests namely, Breusch-Pagan / Cook-Weisberg test for heteroskedasticity (Hettest) and Information Matrix test (Imtest) for heteroskedasticity

(White, 1980). The results of Hettest and Imtest test as depicted in Table 5.3 confirm that our all four models are suffering from heteroskedasticity. Hence, to control the adverse effect of heteroskedasticity problem the study applies robust standard errors (White, 1980) while computing the individual coefficients through the regression models to make results best linear unbiased estimator.

Table 5.3: Test of Heteroskedasticity

Test	Regression Model	Results
Breusch-Pagan / Cook-Weisberg test	Model 1 (Dependent variable: ROA)	Chi2 (1) = 11.42*
	Model 2 (Dependent variable: ROE)	Chi2 (1) = 19.43*
	Model 3 (Dependent variable: TQ)	Chi2 (1) = 44.21*
	Model 4 (Dependent variable: MBVR)	Chi2 (1) = 65.60*
White's Information Matrix test	Model 1 (Dependent variable: ROA)	Chi2 (54) = 184.80*
	Model 2 (Dependent variable: ROE)	Chi2 (54) = 116.25*
	Model 3 (Dependent variable: TQ)	Chi2 (54) = 141.43*
	Model 2 (Dependent variable: MBVR)	Chi2 (54) = 155.60*

Note: * Denotes 1 per cent level of significance

Source: Calculated by Researcher

5.3 Panel Data Analysis

The study, after confirming the non-existence of multicollinearity and resolving the heteroskedasticity problem, proceeds to panel data regression analysis. For our first estimation model which regresses ROA with the capital structure and ownership

structure variables along with a set of control variables, among the three regression models, the F-statistic of OLS and FEM and the Wald-χ2 statistic of REM is found to be significant at 1 percent level (Table 5.4). Furthermore, the restricted F-test statistic [F (70, 400) = 12.05*], BP-LM test statistic [χ^2(1) = 388.46*] and Hausman test statistic [χ^2 (9) = 32.81*] are all found to be highly significant (Table 5.5). The restricted F test chooses FEM over OLS, the BP-LM test chooses REM over OLS and the Hausman test selects FEM over REM. Therefore, we find FEM as the best fit regression model for establishing relationship between the variables.

Table 5.4: Panel Regression Results (Dependent Variable: ROA)

Ordinary Least Square Model			**Fixed Effect Model**		**Random Effect Model**	
	Coefficient	**t-Stat**	**Coefficient**	**t-Stat**	**Coefficient**	**z-Stat**
Intercept	10.34	3.06*	17.95	3.27*	18.70	4.42*
CS	-5.21	-10.56*	-5.26	-7.64*	-4.86	-8.22*
ODP	0.12	4.42*	0.13	1.98**	0.09	2.49**
OFP	0.07	1.72***	0.18	1.62	0.05	0.87
OIIN	0.08	2.16**	0.14	3.52*	0.11	3.08*
OWN_CON	-7.63	-2.61*	-1.54	-0.25	-3.95	-0.96
AGE	-0.01	-1.33	-0.33	-2.38**	-0.03	-1.30
LQDT	0.48	1.57	0.23	1.74***	0.32	2.54**
AUE	3.43	7.03*	7.62	10.02*	5.84	9.66*
FS	-0.99	-4.02*	-1.26	-1.56	-2.16	-6.19*
F-Stat	41.67*		28.11*			
Wald-χ2					294.40*	
R2	0.48		0.39		0.38	

Note: * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance

*** Denotes 10 per cent level of significance

Source: Calculated by Researcher

Table 5.5: Selection of Appropriate Model from Table 5.4

Purpose	Null Hypothesis	Test	Test Statistic
Ordinary Least Square Model Vs Fixed Effect Model	All $u_i = 0$	Restricted F Test	$F(70, 400) = 12.05^{*}$
Ordinary Least Square Model Vs Random Effect Model	$\sigma^2_u = 0$	Breusch-Pagan Lagrange Multiplier Test	$\chi^2(1) = 388.46^{*}$
Fixed Effect Model Vs Random Effect Model	Difference in coefficients is not systematic	Hausman Test	$\chi^2(9) = 32.81^{*}$

Note: * Denotes 1 per cent level of significance

Source: Calculated by Researcher

It is already discussed in the ***Research Methods*** sub-section of the ***Fourth Chapter*** that the fixed effect model as a static panel data analysis can't control the potential bias that arises due to endogeneity problem and therefore the results produced under this model must not be treated as robust. Therefore, to consider the dynamism of relationship and to eliminate the bias caused by potential endogeneity of the explanatory variables including the lagged dependent variable the study estimates the Arellano-Bond (1991) dynamic panel estimation technique. The dynamic panel regression model including one-step and two-step estimations are presented in Table 5.6. The Arellano-Bond (1991) dynamic panel estimation also includes test for the validity of the instruments used and autocorrelation problem in the model used. The Sargan test for over-identification statistic is found to be insignificant implying that our estimation models do not suffer from the problem of over-identification restrictions. The underlying null-hypothesis of the test can't be rejected which means the instrument used in the estimations are valid, implying that these instruments are not correlated with the error term (Mahakud and Misra, 2009).

Table 5.6: Results of Arellano-Bond Dynamic Panel Data Model (Dependent Variable: ROA)

Variables	One Step Estimates		Two Step Estimates	
	Coefficient	z-Stat	Coefficient	z-Stat
Intercept	10.24	1.08	13.92	1.65***
ROA_{it-1}	-0.02	-0.15	0.01	0.08
CS	-5.84	-5.02*	-5.81	-5.31*
ODP	0.12	1.50	0.11	1.43
OFP	0.21	2.19**	0.22	2.28**
OIIN	0.10	2.26**	0.11	2.45**
OWN_CON	-14.88	-1.70***	-13.56	-1.65***
AGE	-0.93	-3.31*	-0.72	-2.66*
LQDT	0.02	0.25	-0.02	-0.34
AUE	6.27	3.07*	5.91	3.65*
FS	2.98	1.54	1.63	0.88
Wald–Chi^2	72.89*		87.34*	
Sargan Test for over-identification			8.37 (p= 0.14)	
Arellano-Bond Test for AR (1)	-2.79* (p=0.0052)		-2.73* (p= 0.0064)	
Arellano-Bond Test for AR (2)	-1.485 (p=0.1376)		-1.5124 (p= 0.1304)	

Notes: i. * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance

*** Denotes 10 per cent level of significance

ii. z-statistics in one step estimation are based on robust-standard error to control for heteroskedasticity and autocorrelation

Source: Calculated by Researcher

The Arellano-Bond AR (1) test for first order autocorrelation is found significant, however, AR (2) is found to be insignificant which implies that our model is free from second order autocorrelation problem and for system GMM we can proceed with this condition (Kathavate and Mallik, 2012). Again, the highly significant Wald–Chi^2 statistics of one and two step estimations confirm that both the models are statistically significant. It is already mentioned that, the z-statistics of regression coefficients produced by step-one are based on robust standard error and hence the study only considers these coefficients for the purpose of testing our hypotheses and drawing subsequent inferences.

From table 5.7 to table 5.15, the same procedure is followed for other three regression models with ROE, TQ and MBVR as dependent variables respectively. In all such cases, the FEM models are found to be best fit in the static panel data analyses. Again, in the same way as before, the study considers the z-statistics of regression coefficients produced by step-one estimator under dynamic panel data analysis.

Table 5.7: Panel Regression Results (Dependent Variable: ROE)

Ordinary Least Square Model			**Fixed Effect Model**		**Random Effect Model**	
	Coefficient	**t-Stat**	**Coefficient**	**t-Stat**	**Coefficient**	**z-Stat**
Intercept	19.29	2.58*	66.79	4.77*	54.94	5.41*
CS	-4.30	-3.46*	-5.58	-3.20*	-3.25	-2.24**
ODP	0.21	3.41*	0.33	1.95***	0.14	1.60
OFP	0.05	0.51	-0.05	-0.19	-0.07	-0.51
OIIN	0.22	2.83*	0.32	3.18*	0.25	2.82*
OWN_CON	-6.07	-0.92	-14.88	-0.95	-4.31	-0.46
AGE	-0.02	-0.96	-1.32	-3.75*	-0.08	-1.40
LQDT	0.17	0.51	0.17	0.51	0.39	1.20
AUE	11.75	10.01*	17.79	9.29*	14.53	10.05*
FS	-2.69	-4.06*	-3.67	-1.79***	-6.70	-8.15*
F-Stat	26.77*		31.99*			
Wald-χ2					280.99*	
R^2	0.41		0.41		0.39	

Note: * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance *** Denotes 10 per cent level of significance
Source: Calculated by Researcher

Table 5.8: Selection of Appropriate Model from Table 5.7

Purpose	Null Hypothesis	Test	Test Statistic
Ordinary Least Square Model Vs Fixed Effect Model	All $u_i = 0$	Restricted F Test	$F(70, 407) = 9.09^{*}$
Ordinary Least Square Model Vs Random Effect Model	$\sigma^2_u = 0$	Breusch-Pagan Lagrange Multiplier Test	$\chi 2(1) = 240.69^{*}$
Fixed Effect Model Vs Random Effect Model	Difference in coefficients is not systematic	Hausman Test	$\chi^2(9) = 81.65^{*}$

Note: * Denotes 1 per cent level of significance

Source: Calculated by Researcher

Table 5.9: Results of Arellano-Bond Dynamic Panel Data Model (Dependent Variable: ROE)

Variables	One Step Estimates		Two Step Estimates	
	Coefficient	z-Stat	Coefficient	z-Stat
Intercept	71.41	2.58^{*}	57.49	2.98^{*}
ROE_{it-1}	0.09	0.71	-0.06	-0.50
CS	-9.69	-2.04^{**}	-14.33	-4.06^{*}
ODP	0.10	0.33	0.54	2.29^{**}
OFP	-0.16	-0.57	0.02	0.05
OIIN	0.30	2.02^{**}	0.24	1.72^{***}
OWN_CON	-42.07	-1.70^{***}	-56.94	-2.66^{*}
AGE	-2.50	-3.02^{*}	-2.90	-4.01^{*}
LQDT	-0.09	-0.27	0.01	0.08
AUE	13.41	2.39^{**}	9.88	2.02^{**}
FS	3.53	0.59	6.34	1.29
Wald–Chi^2	80.49^{*}		94.18^{*}	
Sargan Test for over-identification			3.70 (p=0.59)	
Arellano-Bond Test for AR (1)	-1.98^{**} (p= 0.0479)		-0.96 (p= 0.3391)	
Arellano-Bond Test for AR (2)	-1.65 (p= 0.1000)		-1.48 (p=0.1400)	

Notes: i. * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance *** Denotes 10 per cent level of significance

ii. z-statistics in one step estimation are based on robust-standard error to control for heteroskedasticity and autocorrelation

Source: Calculated by Researcher

Table 5.10: Panel Regression Results (Dependent Variable: TQ)

Ordinary Least Square Model			Fixed Effect Model		Random Effect Model	
	Coefficient	**t-Stat**	**Coefficient**	**t-Stat**	**Coefficient**	**z-Stat**
Intercept	-1.54	-1.57	-2.32	-1.32	-3.18	-2.51**
CS	-1.22	-8.76*	-0.90	-4.22*	-1.15	-6.42*
ODP	0.07	7.95*	0.02	0.75	0.07	5.91*
OFP	0.08	6.66*	0.04	1.52	0.09	5.36*
OIIN	0.03	2.61*	0.03	2.47**	0.03	2.97*
OWN_CON	-6.68	-8.36*	-3.32	-1.67***	-5.72	-4.80*
AGE	-0.007	-2.36**	0.18	4.04*	-0.001	-0.16
LQDT	0.02	0.88	0.08	1.89***	0.05	1.14
AUE	0.51	3.88*	0.60	2.50**	0.69	3.83*
FS	0.07	0.90	-0.46	-1.79***	0.22	2.09**
F-Stat	23.46*		10.02*			
Wald-χ2					126.98*	
R2	0.43		0.18		0.13	

Note: * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance *** Denotes 10 per cent level of significance
Source: Calculated by Researcher

Table 5.11: Selection of Appropriate Model from Table 5.10

Purpose	Null Hypothesis	Test	Test Statistic
Ordinary Least Square Model Vs Fixed Effect Model	All $u_i = 0$	Restricted F Test	$F(70, 406) = 7.94^*$
Ordinary Least Square Model Vs Random Effect Model	$\sigma^2_u = 0$	Breusch-Pagan Lagrange Multiplier Test	$\chi 2(1) = 262.99^*$
Fixed Effect Model Vs Random Effect Model	Difference in coefficients is not systematic	Hausman Test	$\chi 2(9) = 36.59^*$

Note: * Denotes 1 per cent level of significance
Source: Calculated by Researcher

Table 5.12: Results of Arellano-Bond Dynamic Panel Data Model (Dependent Variable: TQ)

Variables	One Step Estimates		Two Step Estimates	
	Coefficient	z-Stat	Coefficient	z-Stat
Intercept	4.57	2.11**	5.75	2.86*
TQ_{it-1}	0.18	1.83***	0.21	4.49*
CS	-1.06	-3.83*	-0.86	-3.46*
ODP	0.01	0.31	-0.002	-0.08
OFP	0.05	2.11**	0.05	1.88***
OIIN	0.02	1.83***	0.02	1.85***
OWN_CON	-5.79	-1.90***	-4.66	-1.59
AGE	0.18	2.72	0.12	2.09**
LQDT	-0.001	-0.03	0.02	0.60
AUE	-0.17	-0.51	0.003	0.01
FS	-1.09	-2.83*	-1.05	-2.91*
Wald–Chi^2	56.58*		95.58*	
Sargan Test for over-identification			7.02 (p=0.22)	
Arellano-Bond Test for AR (1)	-4.15* (p=0.0000)		-4.05* (p=0.0001)	
Arellano-Bond Test for AR (2)	-1.45 (p=0.1460)		-1.59 (p=0.1127)	

Notes: i. * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance *** Denotes 10 per cent level of significance

ii. z-statistics in one step estimation are based on robust-standard error to control for heteroskedasticity and autocorrelation

Source: Calculated by Researcher

Table 5.13: Panel Regression Results (Dependent Variable: MBVR)

Ordinary Least Square Model			Fixed Effect Model		Random Effect Model	
	Coefficient	**t-Stat**	**Coefficient**	**t-Stat**	**Coefficient**	**z-Stat**
Intercept	-5.93	-2.66*	-2.47	-0.64	-5.99	-2.16**
CS	-1.57	-4.76*	-0.21	-0.45	-0.85	-2.17**
ODP	0.14	6.67*	0.03	0.73	0.13	5.10*
OFP	0.16	5.59*	0.08	1.31	0.17	4.74*
OIIN	0.06	2.43**	0.08	2.76*	0.08	3.13*
OWN_CON	-11.62	-7.02*	-11.39	-2.60*	-11.01	-4.20*
AGE	-0.01	-1.73***	0.27	2.84*	-0.001	-0.08
LQDT	-0.09	-1.68***	0.04	0.46	-0.002	-0.02
AUE	2.21	6.77*	1.84	3.47*	2.19	5.51*
FS	0.23	1.47	-0.97	-1.72***	0.17	0.77
F-Stat	19.34*		5.50*			
Wald-χ2					90.57*	
R^2	0.39		0.11		0.08	

Note: * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance
*** Denotes 10 per cent level of significance
Source: Calculated by Researcher

Table 5.14: Selection of Appropriate Model from Table 5.13

Purpose	Null Hypothesis	Test	Test Statistic
Ordinary Least Square Model Vs Fixed Effect Model	All $u_i = 0$	Restricted F Test	F(70, 409) = 8.53*
Ordinary Least Square Model Vs Random Effect Model	$\sigma^2_u = 0$	Breusch-Pagan Lagrange Multiplier Test	χ 2(1) = 358.33*
Fixed Effect Model Vs Random Effect Model	Difference in coefficients is not systematic	Hausman Test	χ 2(9) = 18.39**

Note: * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance
Source: Calculated by Researcher

Table 5.15: Results of Arellano-Bond Dynamic Panel Data Model (Dependent Variable: MBVR)

Variables	One Step Estimates		Two Step Estimates	
	Coefficient	z-Stat	Coefficient	z-Stat
Intercept	5.19	1.03	6.61	1.66***
$MBVR_{it-1}$	0.03	0.31	0.15	1.81***
CS	0.25	0.32	-1.24	-1.88***
ODP	0.03	0.53	0.03	0.63
OFP	0.09	1.00	0.02	0.31
OIIN	0.08	2.23**	0.06	1.78***
OWN_CON	-21.57	-2.70*	-23.57	-3.07*
AGE	0.14	0.90	0.02	0.15
LQDT	-0.07	-0.68	0.02	0.18
AUE	0.53	0.58	0.57	0.70
FS	-0.98	-0.89	-0.61	-0.73
Wald–Chi2	23.49*		28.72*	
Sargan Test for over-identification			6.82 (p= 0.23)	
Arellano-Bond Test for AR (1)	-4.44* (p= 0.0000)		-3.93* (p= 0.0000)	
Arellano-Bond Test for AR (2)	-1.10 (p=0.2729)		-1.23 (p= 0.2201)	

Notes: i. * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance *** Denotes 10 per cent level of significance
ii. z-statistics in one step estimation are based on robust-standard error to control for heteroskedasticity and autocorrelation
Source: Calculated by Researcher

5.4 Largest Ownership and Corporate Performance

Considering the unique importance of largest shareholders especially in Indian manufacturing companies the study attempts to estimates the effect of largest shareholders' ownership on the measures of corporate performance. Moreover, the study also estimates the non-linear relationship between largest ownership and corporate performance in context of Indian manufacturing companies. The non-linear

effect and the threshold point of largest ownership at which the effect gets changed are tried to be estimated and presented below:

5.4.1 Largest Ownership and its Non-Linear Effect

This sub-section is included as an extended part of data analysis considering a flurry of literatures that suggest a non-linear relationship especially between ownership concentration and firm value in context of various markets. Where in case composition of ownership the evidence of non-linearity in relationship is very limited (e.g. Kumar, 2004), the studies on ownership concentration in different countries perspective as outlined in our review of literature section give evidences of both linear as well as non-linear relationship. In this premise, the present study finds it more sensible to assume and test the non-linear relationship between the variables. Another notable fact is that, where most of manufacturing firms in India are family controlled (Selarka, 2005; Altaf, 2016), the largest owner plays the most dominative role in the management of affairs of companies. In this study, among 91 manufacturing firms as the sample, average shareholding by largest shareholder is 33.62 whereas largest value of the variable is found to be 98.38 percent. Therefore, recognizing the distinct importance of the largest shareholder in Indian manufacturing sector, in this extended analysis the study makes an attempt to test the impact of largest shareholders on the performance of Indian manufacturing firms. To test the non-linearity the study again adopts the Arellano-Bond (1991) dynamic panel model which is based on Generalised Method of Moments (GMM).

In table 5.16 the study in a very precise form presents the results of one step estimation of dynamic panel data analysis only of the largest ownership variable denoted by Largest_Own. The researcher considers the coefficients of one step

estimations to arrive at the findings as per the earlier given justification. Based on one step estimators, the study finds a non-linear relationship between ownership by largest shareholders and the accounting performance measured by ROA and ROE of Indian manufacturing firms. For both the measures of accounting performance, the study evidences a negative impact of ownership till a certain threshold of concentration and a positive impact after that point of ownership concentration by the largest owner. However, in case of market performance the study finds a non-linear relationship of similar pattern in case of MBVR only. Therefore, the study finds a quadratic (U-shaped) relationship between ownership concentration by largest owner and firm performance.

Table 5.16: Test of Non-Linearity: Result of One Step Estimation

Variables	ROA		ROE		MBVR	
	Coefficient	z-Stat	Coefficient	z-Stat	Coefficient	z-Stat
Largest_Own	-0.19	-2.55**	-0.69	-2.71*	-0.19	-3.13*
Largest_Own^2	0.002	1.85***	0.007	2.13**	0.002	1.93***
Wald–Chi2	94.85*		108.24*		24.96*	
Arellano-Bond Test for AR (1)	-3.52 (p= 0.0004)		-1.52 (p= 0.13)		-4.93 (p= 0.00)	
Arellano-Bond Test for AR (2)	-1.69 (p=0.10)		-1.46 (p= 0.14)		-1.57 (p= 0.12)	
Threshold ($\beta_1/2\beta_2$)	47.50		49.28		47.50	

Notes: i. * Denotes 1 per cent level of significance ** Denotes 5 per cent level of significance *** Denotes 10 per cent level of significance
ii. z-statistics in one step estimation are based on robust-standard error to control for heteroskedasticity and autocorrelation

Source: Calculated by Researcher

5.4.2 Determination of Threshold Level of Largest Ownership

The study shows the quadratic relationship through estimating a non-linear model with a squared term of the independent variable. The quadratic curb has only one

breakpoint, which is optimally derived by taking the first differentiation with respect to ownership concentration.

The regression equation representing the quadratic relationship between the variables is as below:

$$\mathbf{Y_i = \alpha + \beta_1 X_i + \beta_2 X_i^2 + ...}$$

Now, as per the condition of maximum threshold i.e. partial derivative would be equal zero, the threshold level of Largest_Own can be derived by the following model:

$\mathbf{\beta_1 + 2\beta_2}$ **Threshold of Largest_Own = 0,** where β_1 and β_2 are the two coefficients of the variable and carry opposite sign.

or, Threshold of Largest_Own = - ($\beta_1/2\beta_2$)

Following the technique, the threshold of Largest_Own is found to be 47.50, 49.28, and 47.50 for ROA, ROE and MBVR respectively (table 5.16).

5.5 Findings of the Study

Based on panel data regression analysis which includes the static and dynamic panel data estimations, the study obtains a number of crucial findings relating to the effect of capital structure, ownership structure including concentration and a set of firm specific characteristics on the accounting and market related performance of BSE listed manufacturing companies in India. The findings in regard to each and every independent variable are written as below:

5.5.1 Capital Structure and Corporate Financial Performance

The study frames the null hypothesis that, 'there is no relationship between capital structure and corporate performance'.

The panel data estimation establishes a statistically significant relationship between capital structure and firm performance. Both the static and dynamic model of panel data estimation approves that, capital structure of Indian manufacturing companies has crucial bearing on their financial performance. To be specific, capital structure measured by debt-equity ratio is found to be negatively related with the accounting and market performance of Indian manufacturing companies. Capital structure is found to have negative effect on both the proxies used for accounting performance i.e. ROA and ROE. The coefficients against ROA in the static and dynamic panel estimations are found to be -5.26 and -5.84 respectively at one percent level of significance. The coefficients against ROE in the same models are found to be -5.58 and -9.69 at one percent level of significance. Regarding market performance, the coefficients for TQ is only found to be negative and statistically significant at both the estimation models. The effect of capital structure on the market performance measured by MBVR is statistically insignificant as per both the estimation models.

Therefore, based on the findings of the panel data estimation on the relationship between capital structure and firm performance, it can be inferred that the use of borrowed capital ultimately exerts an unfavourable impact on the operational efficiency and performance of Indian manufacturing companies. In other words, the Indian manufacturing firms are found to be profitable and value creating when they are more relying on owners' fund instead of borrowed fund.

Thus, on the basis of the results of panel data estimations, the study fails of accept the null hypothesis and infers that capital structure of Indian manufacturing companies is significantly related to their financial performance.

5.5.2 Ownership Structure and Corporate Financial Performance

The ownership structure in the present study is represented by using a number of proxy variables. The effect of ownership structure on firm performance is tried to be examined by introducing a number of ownership forms which includes, domestic promoters' ownership, ownership of foreign promoters, ownership of institutional investors and ownership concentration. The specific effect that each of these ownership forms exerts on the financial performance of the sampled firms are discussed below:

I. Ownership of Domestic Promoters and Corporate Performance

Regarding the effect of ownership of domestic promoters on the accounting and market related performance measures of Indian manufacturing companies it is evidenced that, although the static panel data estimation shows a positive impact of domestic promoters' ownership on accounting performance but the dynamic panel estimation doesn't give evidence of any statistical relationship between ownership of domestic promoters and accounting performance of Indian manufacturing firms. Moreover, both of the estimations i.e. static and dynamic suggest no statistical relationship between domestic promoters' ownership and market performance of such firms as the coefficients against TQ and MBVR are found to be insignificant under both the estimation models. Moreover, the effect of domestic promoters' ownership on the accounting performance measures especially on ROE is found to be weak i.e. significant at 10 percent level of significance. Therefore, based on the study findings it can be inferred that Indian promoters exert a positive but weak influence on the performance and value of Indian manufacturing companies.

II. Ownership of Foreign Promoters and Corporate Performance

Regarding the relationship between foreign promoters' shareholding and firm performance, only the dynamic panel data estimation suggests a positive impact of foreign promoters' shareholdings on the accounting performance and market performance measured by ROA and TQ respectively. The coefficients of one step estimation against these two dependent variables are found to be 0.21 and 0.05 respectively with 5 percent level of significance (table 5.6 and table 5.12). Therefore, although all the variables used to measure the financial performance of our sampled firms are not found to be affected by the changes in ownership by foreign promoters but it can be definitely inferred from the results of dynamic panel estimation that foreign promoters are indeed relevant towards the monitoring and controlling of managerial discretionary expenses and opportunistic use of firms' resources by management. Besides, increase of foreign promoters' participation in the ownership and control of Indian manufacturing companies also seems to create value for them.

III. Ownership of Institutional Investors and Corporate Performance

Ownership by institutional investors is found have positive impact on all the variables used to represent the accounting and market performance of the sampled firms for both the estimation techniques. Therefore, the contribution of institutional investors like banks, NBFCs, mutual funds and insurance companies etc. in closely supervising the management of affairs and thereby neutralising the owners-managers agency problem in Indian manufacturing companies is quite confirmed. Moreover, this is the only variable among the set of independent variables considered in the study which is found to have significant impact on all the measures of financial performance.

IV. Ownership Concentration and Corporate Performance

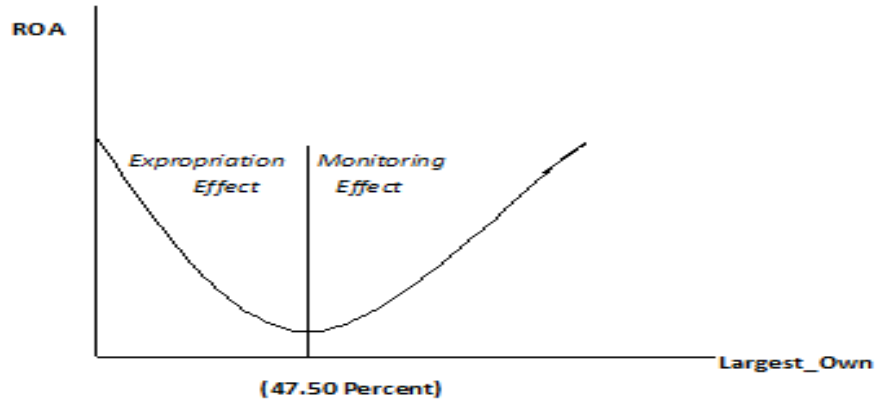
The dynamic panel estimation suggests a negative relationship between ownership concentration measured by Herfindahl-Hirschman Index (HHI) and both the measures of accounting performance. The coefficients for two accounting measures i.e. ROA and ROE are found to be -14.88 and -42.07 (table 5.6 and table 5.9). However, the statistical relationship between ownership concentration and accounting performance is not found so strong, as both the coefficients are significant at 10 percent level. Moreover, both the estimation techniques suggest a negative impact of ownership concentration on market related performance of Indian manufacturing firms. It implies that, as the ownership gets concentrated among a circumscribed number of shareholders the expropriation effect becomes prominent which adversely impacts financial performance.

V. Largest Ownership and Corporate Performance

In the extended part of our panel data analysis, the study estimates a test for non-linear effect of ownership concentration especially the ownership by the largest shareholder on firm performance. The non-linearity test is encouraged by a number of past empirical investigations like Caixe and Krauter (2013) in context of Brazilian firms, Kumar and Singh (2013) in context of BSE listed Indian companies, Altaf and Shah (2018) in context of Indian manufacturing companies. These studies either documented a U-shaped or an inverted U-shaped relationship between these two variables. The present study applies dynamic panel estimation to confirm the non-linearity effect of ownership concentration by the largest shareholder on the financial performance of Indian listed manufacturing companies. Now, an expropriation effect by the largest shareholder is evidenced in Indian manufacturing firms which last up to

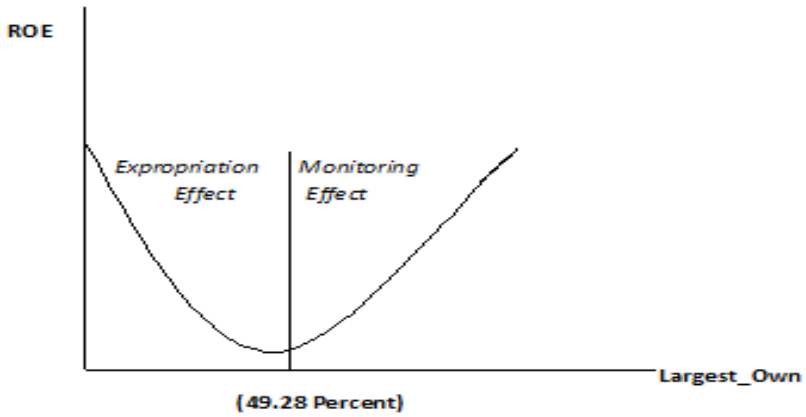
a threshold of 47.50 percent of ownership for ROA, 49.28 percent for ROE and 47.50 percent for MBVR (Table 5.16). The findings on the non-linearity effect on these three measures of firm performance are graphically presented in Figure 5.1 to Figure 5.3.

Figure 5.1: Non-Liner Effect of Largest_Own on ROA



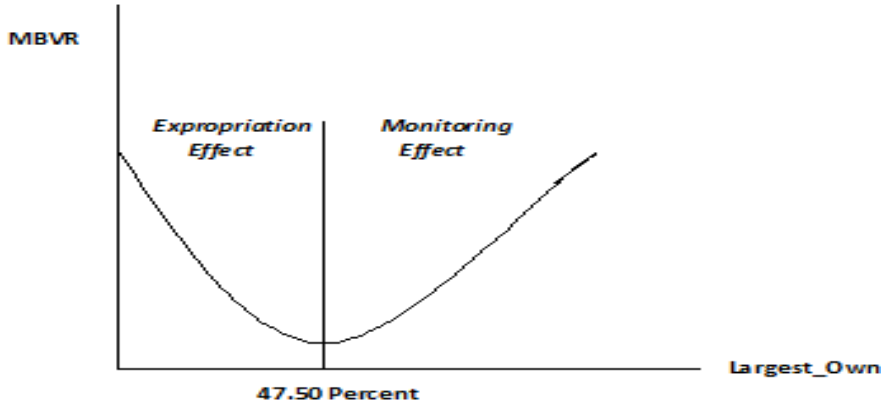
Source: Researcher

Figure 5.2: Non-Liner Effect of Largest_Own on ROE



Source: Researcher

Figure 5.3: Non-Liner Effect of Largest_Own on MBVR



Source: Researcher

However, the study doesn't find any significant non-linear effect of ownership by largest shareholder on TQ. Therefore, our general inference in this regard is that, as the ownership by largest shareholder approaches to more or less fifty percent the effect of largest ownership on performance gets shifted from expropriation to effective monitoring, resulting into a positive impact on the accounting performance and market valuation of Indian manufacturing companies.

Finally, based on the results obtained from the panel data estimations regarding the ownership-performance relationship, the study fails to accept both the null hypotheses of our hypotheses II and III. Therefore, the null hypothesis that says 'there is no relationship between the ownership structure and corporate performance' is not found to be true for this study. Besides, the null hypothesis 'ownership concentration does not significantly affect corporate performance' is also rejected by the researcher.

Having rejected the above two null-hypotheses, the study confirms a statistical significant relationship between various forms of ownership including ownership concentration and the financial performance of Indian manufacturing companies.