Importance of stock index in acquisition of Indian companies

Partha Sen

Abstract—**Overall acquisition is very frequent monthly event in India in this higher growth stage. These acquisitions are mostly paid through cash as single medium but presence of stock is low for overall acquisition and very negligible for foreign acquirers. Along with this the existence of FDI and foreign acquisition is also significant. In this article the data set from 2000 to 2010 is compiled for research. During this time frame, researcher has identified the presence of wave of acquisition correlated to index. NIFTY is considered as stock index and which has significantly affected the total number of acquisition, acquisition through stock as medium and foreign acquisition of Indian firms at 0.01% level. This can support the existence of market timing theory in acquisition of Indian firms by local firms and foreign firms.**

Index Terms—**FDI, acquisitions, NIFTY, Regression, t-test, F-test, ANOVA.**

I. INTRODUCTION

"Relative prosperities coupled with a buoyant securities market were major economic environmental factors" (Reid, 1968).

In India the acquisitions is mostly paid thorough cash as single medium but other varieties of payment forms are also available. Stock is low in frequency for overall acquisition and lower for foreign acquisition. FDI for acquisition is still uncommon but growing quickly throughout the globe being lucrative for easy accessing the tangible and intangible assets. Market share and other firm specific assets can be easily accessed along with the brand name. Out of that total numbers of acquisitions 30% acquisitions of Indian firms are by foreign companies (see figure 13 in Appendix). FDI enters into a country for three purposes and acquisition is one of them. In the above time series the ratio of foreign acquisition (FA) to FDI is very low in percentage and also volatile with time. Three important inferences can be drawn from FA/FDI ratio, firstly in India still the FDI for the purpose of acquisition is very less and less than 1%. Secondly attractiveness for the investment is changeable may be due the changes in macroeconomic and company specific factors. Lastly after global financial crisis foreign acquisition is still trying to revive but in negative zone so far. The ratio of foreign acquisition value to total acquisition is nearly 40% but fluctuating with time. This can be stated by two important factors, FDI and economic value creation by the acquisition. An important macroeconomic factor for the volatility can be stock index as FDI and NIFTY has correlation of 62% (see

figure 14 in Appendix). This mode is now catching up firstly and comparative to other two modes like green and brown field. In the last decade foreign acquirers are mainly from US, EU, UK and Asia. In India the presence of foreign acquirers from Asia is comparative to UK (see figure 15 in Appendix).

In this research impact of macroeconomic variables are tested through t-test and overall significance of the relation by F-test from the output of regression. Correlations between the variables are tested through t-stat value before regression analysis. Three regression analyses are run to find out the significance of index as macroeconomic variable for acquisition decision.

Here correlation is tested to find out whether in India the market timing theory is also followed by the acquirers. Hence the correlation and hypotheses like deals in shares in any month is dependent to deal value, NIFTY has no effect in change in number of deals, NIFTY has no effect in change in deal value, NIFTY has no effect in change in stock deal & number of deals is dependent to the NIFTY and months. These hypotheses are tested through t and F-test in this paper for analysis.

II. MOTIVATION

Indian market has undergone several acquisitions in this decade, on an average 9 acquisitions per month. This market may follow any wave like first wave during 1990-1995 for policy-shift under Structural Adjustment Program and foreign competition and Second Wave during 1995-2000 due to large presence of multinational firms. Researcher found that this presence of acquisition in India has some own distribution of cash, equity or both kind of acquisitions and also found interesting to go further on researching the past characteristics of the mergers and acquisition. So many hypotheses and reasons are at background to explain acquisitions but in this paper the specific issues are researched in this scope. Researcher motivated to find out those M&A facts for India. US, UK where the developed market is following these developed hypotheses but in India whether any kind of similar pattern is followed is researched in this paper.

III. LITERATURE REVIEW

New holding company is formed through mergers and a new entity is also possible to be created through combination of two or more companies [1]. Acquisition is also a similar concept to merger, which is to get managerial influence through purchasing assets and shares [2]. Through merger and acquisitions new holding company can achieve

objectives of stakeholders [3]. Value chain, relationship and economic area are major three types of merger and acquisition. Horizontal, vertical and conglomerate are three types under value chain. Two kinds of relationship in mergers and acquisition, they are friendly and hostile, whereas under economic concept the merger and acquisition can be domestic and cross border [1]. Merger and Acquisition investment has more response than direct investment, because the M&A investment has high fixed cost and low marginal investment cost activity.

Merger and Acquisition is now significant event in India and the presence of wave is also found. First wave was found during 1990-1995 which was due to policy-shift under structural adjustment program, foreign competition. Second wave was found during 1995-2000 due to the large presence of multinational firms. Past studies could not find any evidence related to efficiency related factor for Mergers in India, but asset growth and market share growth is related to merger motivation. The main motive of merger is for equity financing or for increasing equity size to borrow resources for modernization. The firms under the same business group and in same product line undergo mergers is dominant in India. The motive and implications of merger wave in later 1990s can also be analyzed [4]. Motive of mergers in emerging economies can be modeled up based on occurrence and frequency of mergers instead of value. In India the role of industry level variables in merger activity is important to consider and suggested that low concentration, high cash flow and high Tobin's Q is the explanatory variables for the occurrence and frequency of mergers in industries of India. Again the growth of industries is the motive of mergers but not for restructuring to resist the shocks. Product market competition and corporate strategies is immature in India comparing to the US [5].

Good market condition can lead to increase the number of deals as the acquirers get the asset from target at an effective discount [6]. Even the stock merger deal in good market position is driven by the misvaluation [7] and manager's acquisition decision is also influenced by stock mergers at the good state [8]. This can be interpreted as the managers of acquirers usually pay by stock to target company's owner when they believe those stocks are overvalued at that good market situation. But use of cash in acquisition instead of internal investment is common [9]. Rational model of the merger through stocks is an important concept in merger and acquisition. Consideration of merger-wave is relevant to consideration of stock as medium of exchange because misvaluation is very common related to stock valuation and this can clarify that merger through cash instead of stock considering the rational framework is justified. Stock financed mergers are clustered in time of the high aggregate valuation. It is frequent that cash targets are undervalued because of having negative firm specific error while stock targets are slightly overvalued, where as cash acquirers are less overvalued than stock acquirers [10]. Determinants like index of stock price, change of GNP, prime rate of interest are important for mergers but the previous year value has no role [11].

Foreign acquisition is getting its importance with time but still government is focusing on mostly on Greenfield FDI [12]. From economic theory the existence of foreign fund is positive from the concept of increasing efficiency of firms by decreasing cost [13] and also for technological diffusion. [14]. Firm level factors are important for foreign acquisition but the role of macroeconomic factors are also emphasized by [14]. GDP and foreign acquisition has negative relationship as higher GDP encourages the firm to go for local firms to acquire [15]. Another factor like decreased share price can increase the likelihood of foreign acquisition [16]. And depreciating Exchange rate is also attractive for foreign acquirers from countries of appreciating currency [17]. Lower inflation rate is also attractive for foreign investment for acquisition [18].

IV. RESEARCH METHODOLOGY

Research on acquisition is conducted on three parts. In the first part correlation is drawn between the independent and dependent variables. In the second part hypotheses are tested through t-test and F-test. The p –value of the tests is also applied to test the hypotheses and in the last part OLS regression analysis is applied for modeling. In this article the regression analysis is tested based on the transformed data set to log. Data set is transformed into log to reduce the non stationary of time series data. Then the time series analysis is made through multiple OLS regression assuming the stationary of data.

V. DATA COLLECTION

Data is related to only acquisitions of Indian companies by acquirers from India or from outside for time span of last decade which is from 2000 to 2008. For this monthly secondary data, Zephyr server is used. FDI, exchange rate, inflation and NIFTY data are collected from (Reserve Bank of India) RBI site [19]. From 2000 to 2010 total acquisitions of listed companies in Indian were 1300 and out of that 390 acquisitions were by foreign companies. In this paper the considered data set is only for Indian companies as target.

VI. FINDINGS AND ANALYSIS

Most of the deals are paid through other medium excluding cash and stock, but cash is maximum single medium for payment for overall acquisition.
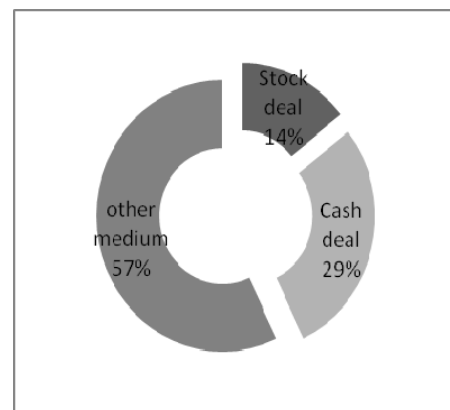

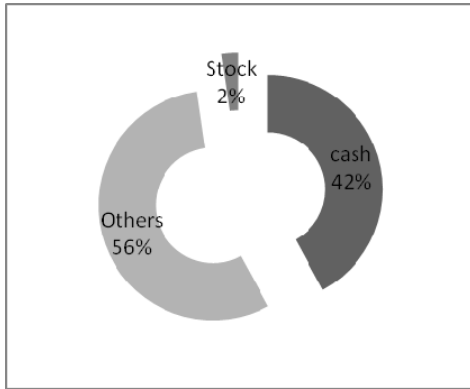Fig. 1. Method of payment for overall acquisition.

Fig. 2. Method of payment for foreign acquisition.

Only 14% of the total acquisition is through shares. Foreign acquirer considers cash or other payment method but stock is very rare. Stock as medium is less attractive to managers than cash as it creates the misvaluation. Cash as medium of deal is important consideration for research but the correlation between the index and cash is very low.

TABLE I: PAYMENT METHOD OF FOREIGN AND TOTAL ACQUISITION

	Cash deal	Stock deal
Foreign acquisition	0.452**	0.065
p-value	0.000	0.458
Total acquisition	0.429**	0.544**
p-value	0.000	0.000

** Significant at 0.01 level

The deal paid though stock is only 14% but the correlation with total acquisition is higher than the cash. From correlation table it can be inferred that stock is insignificant for foreign acquisition but significant for total acquisition. Here total deal, stock deal and foreign deal are considered for research as cash deal is insignificant variable correlating to index as shown in table below.

A. Hypothesis Testing

If the number of deals in a month and NIFTY index is compared graphically then a correlation in the wave in deals and index movement is visible. Further t-test can statistically prove this correlation.
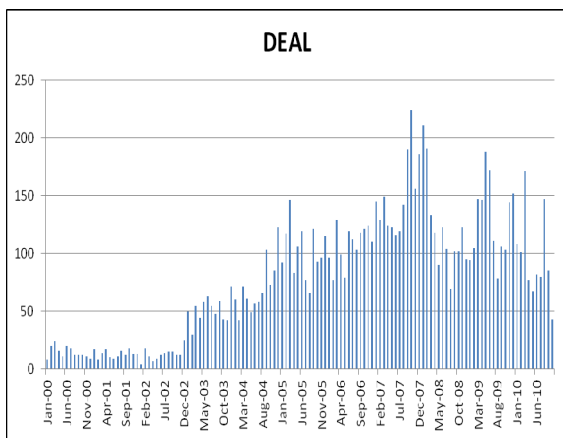

Fig. 3. The frequency distribution of the number of deals in month.

NIFTY index value and number of deals have good correlation, which are statistically significant in 99% confidence level, which can lead this research to go further on hypothesis testing. This positive and good correlation in

between those can lead to in depth research on the effect of NIFTY on change of acquisition number, acquisition value and change in stock deals. NIFTY return has low correlation with the changes in deal numbers value and types.

Null: Deals in shares in any month is dependent to deal value, index value and index *return.*

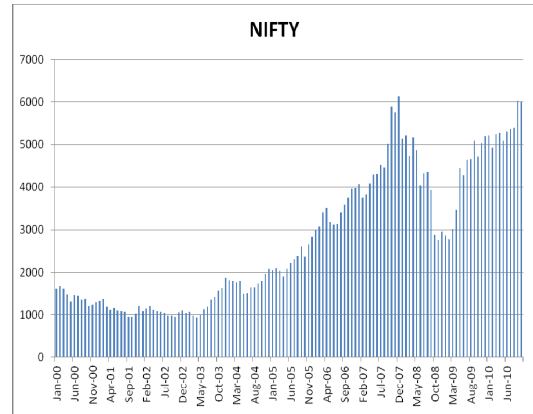*Alternative: Deals in shares in any month is independent to deal value,* index *value and index return.*

Fig. 4. Distribution of the monthly average price of Nifty index.

TABLE II: ANOVA TEST FOR FIRST HYPOTHESIS

Model		Sum of Squares	Mean Square	F	Sig.
1	Regression	84.492	28.164	3.279	.024(a)
	Residual	824.508	8.589		
	Total	909.000			

(a) Predictors: (Constant), Deal value, NIFTY return, NIFTY value
(b) Dependent Variable: Deals in share to total deals in this month

ANOVA test is done with deals in share to total deals in month as dependent variable and Deal value, NIFTY return, NIFTY value are predictors to prove above hypothesis. F-stat value from findings is 3.279, which is higher than the critical value to get P of 0.024 lower than 0.05. Hence it can be inferred that the deals in stocks as decision of payment in mergers of Indian companies is highly dependent to deal value, NIFTY value and return.

Null: index return has no *effect in change in number of deals.*

Alternative: index return has positive *effect in change in number of deals.*

TABLE III: T- TEST FOR SECOND HYPOTHESIS

	Change in number of deals	NIFTY return
Hypothesized Mean Difference	0	
t Stat	-1.718	
P(T<=t) one-tail	0.044	
t Critical one-tail	1.66	

From the t-test, it can be inferred that above null hypothesis is rejected as t-stat value is -1.718 and P is 0.044, which is lower than 0.05 in 95% confidence level. This

statistical finding can help to prove the assumption that NIFTY return has positive effect in change in number of deals.

Null: index return has no effect in change in deal value.
Alternative: index return has positive effect in change in deal value.

TABLE IV: T- TEST FOR THIRD HYPOTHESIS

	Change in number of deals	NIFTY return
Hypothesized Mean Difference	0	
t Stat	-1.869	
P(T<=t) one-tail	0.032	
t Critical one-tail	1.66	

Again using t-test, where t stat is -1.869 and P is 0.032 can reject the null hypothesis. Hence it can be inferred that NIFTY return has positive effect on acquisition deal value. *Null: NIFTY return has no effect in change in stock deal.*

Alternative*: NIFTY return has positive effect in change in stock deal.*

Here t stat value is -1.871 and P value is 0.032 which can reject the null hypothesis or Nifty return has positive effect on change in number of stock deals positively in 95% confidence level.

TABLE V: T- TEST FOR FOURTH HYPOTHESIS

	Change in number of deals	NIFTY return
Hypothesized Mean Difference	0	
t Stat	-1.871	
P(T<=t) one-tail	0.032	
t Critical one-tail	1.66	

B. Correlation Analysis

TABLE VI: CORRELATION WITH NIFTY

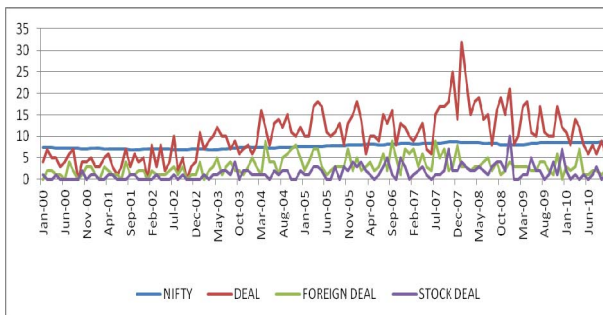|	All deal	Stock deal	Foreign acquisition	Cash deal
NIFTY	0.582	0.394	0.296	0.07
p-value	0.000	0.000	0.001	0.430
	**	**	**	

** Significant at 0.01 level

Fig. 5. Monthly acquisition deals and index value.

Above figure can show a possible relation between the index and different types of deals. But this assumption can be tested through regression analysis.

Above correlations except cash deal are statistically significant, as a result the consideration of overall deal, stock deal and foreign acquisition type are considered for the test of significance of index.

C. Regression Analysis

Total number of acquisition is dependent to important macro variables like exchange rate, inflation and index.

TABLE VII : ANOVA TEST OVERALL ACQUISITION EQUATION

ANOVA					
	df	SS	MS	F	Significance F
Regression	3	1528.679	509.55	27.27	0.000
Residual	126	2353.697	18.680		
Total	129	3882.376			

The result of the regression shows that the relation is significant as F-stat is 27.278 or p-value less than 0.05. In this relation inflation is not significant as p-value is 0.087 which is higher than 0.05.

TABLE VIII: T-TEST FOR TOTAL NUMBER OF ACQUISITION

	Coefficients	t Stat	P-value
Intercept	94.03272	2.261269713	0.025457027*
NIFTY	5.268506	8.392263985	0.000**
EXCHANGE RATE	-27.23535	-3.017802365	0.003081741*
Inflation	-4.8314868	-1.720153891	0.087859535

** Significant at 0.01 level
* Significant as 0.05 level

From the above table, the regression equation (1) can be drawn, where the inflation variable is dropped as t-stat value is lower than critical value or p value is higher than 0.05.

Total acquisition of Indian companies = 94.03+ 5.268(NIFTY) -27.235(exchange rate) (1)

In this equation exchange rate shows negative relation to total acquisition. This relation is in line with theory as higher exchange rate makes the deal costlier. Index (here NIFTY) is positively related to number of acquisition. It can be inferred that the increase in index can effect positively to increase the number of acquisition in India. This statement is not valid for cash deals as NIFTY has insignificant correlation with cash paid deals but right for cash deals as acquirers are more benefitted by value creation. R square value is 39% can prove the goodness of fit of this model.

If another regression is run for only stock paid acquisitions instead of considering total acquisitions then this (2) equation will be changed with different coefficients for independent variables.

Acquisitions paid through stocks= 1.078(NIFTY)-6.55(exchange rate) (2)

TABLE IX: ANOVA TEST FOR STOCK ACQUISITION EQUATION

ANOVA					
	df	SS	MS	F	Significance F
Regression	3	66.98	22.33	9.802	0.000
Residual	126	287	2.278		
Total	129	354			

TABLE X: T-TEST FOR STOCK PAID ACQUISITION

	Coefficients	t Stat	P-value
Intercept	23.11	1.591	0.114
NIFTY	1.078	4.917	0.000**
EXCHANGE RATE	-6.55	-2.08	0.04*
Inflation	-1.08	-1.1	0.273

** Significant at 0.01 level
* Significant as 0.05 level

Only NIFTY and exchange rate are significant at 95% confidence level. Hence both the total number of acquisitions and acquisitions paid through stock has same significant macroeconomic variables.

TABLE XI: ANOVA FOREIGN ACQUISITION EQUATION

ANOVA					
	df	SS	MS	F	Significance F
Regression	3	66.98	22.33	9.802	0.000
Residual	126	287	2.278		
Total	129	354			

Regression analysis by considering the foreign acquisition as dependent variable shows that index is significant macroeconomic factor for making decision.

TABLE XII: T-TEST FOR FOREIGN ACQUISITION

	Coefficients	t Stat	P-value
Intercept	-32.8913	-1.68	0.096
NIFTY	1.032250	3.489	0.000**
EXCHANGE RATE	6.082211	1.43	0.155
Inflation	-1.070778	-0.81	0.42

** Significant at 0.01 level

Over all F-stat value is 5.079, which is significantly higher than the critical value or p-value is 0.002. This indicates the relation of foreign acquisition with macro variables is significant but the t-stat value of intercept, exchange rate, and inflation is lower than critical value.

VII. CONCLUSION

India has passed through an optimistic and prospective growth phase in the last decade. Above average growth can be explained through different macroeconomic factors and its coefficients. Foreign investment and acquisition have significant pace in comparison to the economic growth. Foreign investment has important role in growth and prominently participated in this growth phase from 2000 to 2010. As a developing country, India is included in the list of 10 developing counties for attractiveness to those foreign investors. Consideration of FDI as an important factor for growth is very common at outcome of many researches. Participation of FDI cannot be denied for Greenfield, Brownfield and acquisition purpose. FDI has significant role in foreign acquisition is significantly dependent to the index value.

From the above findings and analysis, it can be summarized that in India, the correlation between index value and number of acquisitions are significant in 99% confidence level. Deals in stocks as decision of payment in acquisitions of Indian companies is highly dependent to

index. Index has also positive effect in foreign acquisition. In India increase in index increases the number of deals, stock deals and foreign acquisition. From market timing theory this positive significant relation can be explained. Higher index value will result better valuation to acquirer. Several macro factors are involved to explain these acquisitions as here exchange rate and inflation are considered but the importance of index is proved as this variable is common to explain the three types of deals like total deals, stock deals and foreign deals. Hence index being a complicated index related to many macro economic variables can be considered for future prediction of acquisitions in India.
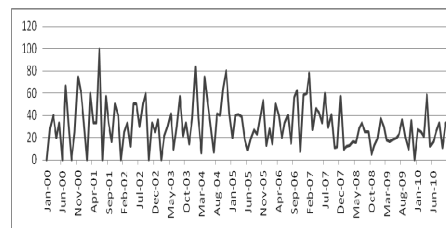
APPENDIX

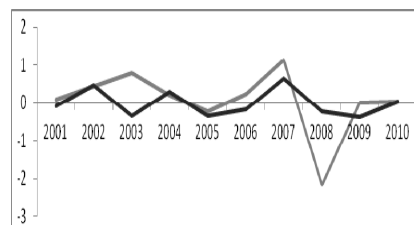Fig. 6. Monthly ratio of number of foreign acquisition to total acquisition.

Fig. 7. Yearly change of foreign acquisition value to FDI and total acquisition value.
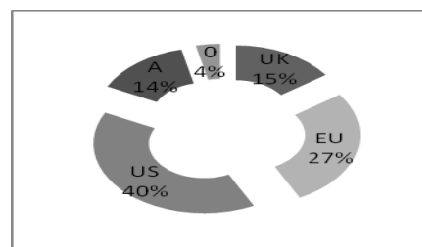

Fig. 8. Share of foreign acquirers in last decade.

TABLE XIII: CORRELATION BETWEEN EXCHANGE RATE AND DEAL

	EXCHANGE RATE	DEAL
EXCHANGE RATE	1	
DEAL	-0.19561	1

TABLE XIV: CORRELATION BETWEEN EXCHANGE RATE AND FOREIGN DEAL

	EXCHANGE RATE	DEAL
EXCHANGE RATE	1	
DEAL	0.128007246	1

TABLE XV: CORRELATION BETWEEN EXCHANGE RATE AND FOREIGN DEAL

	CPI	FOREIGN DEAL
CPI	1	
FOREIGN DEAL	-0.232966466	1

TABLE XVI: CORRELATION BETWEEN EXCHANGE RATE AND FOREIGN DEAL

	CPI	FOREIGN DEAL
CPI	1	
FOREIGN DEAL	-0.487372466	1

REFERENCES

[1] P. A. Gaughan, "Mergers, Acquisitions, and Corporate restructuring," 3rd ed, New York, John Wiley & Sons, Inc, 2002.

[2] H. R. Nakamura, "Motives, partner selection and productivity effects of M&As: The pattern of Japanese mergers and acquisition," Thesis, *Institute of International Business,* Stockholm School of Economics, 2005,

[3] S. Sudarsanam, "Creating value from mergers and acquisitions: The challenges," Harlow, Pearson Education Limited, 2003.

[4] P. L. Beena, (2004) Towards understanding the merger-wave in the Indian corporate sector: a comparative perspective, *Retrieved September 2, 2011 from: http://www,cds,edu/download_files/355,pdf*

[5] M. Agrawal and R. Sensarma, "Determinants of merger activity: Evidence from India," I*nternational Journal of Financial Services Management*, vol. 2, no. 4, pp. 277-288, 2007.

[6] A. Shleifer and R. W. Vishny, "Stock market driven acquisitions," *Journal of Financial Economics,* vol, 70, pp, 295-311, 2003.

[7] M. R. Kropf and S. Viswanathan, "Market valuation and merger waves," *The Journal of Finance,* vol. 59, no. 6, pp. 2685-2718, 2004.

[8] M. C. Jensen, "Agency costs of free cash flow, corporate finance, and takeovers," *American Economic Review,* vol. 76, no. 2, pp. 323-329, 1986.

[9] P. L. Rousseau, "The Q-theory of mergers: International and cross-border evidence," 2009. [Online] Available: www.hnb.hr/dub-konf/15-konferencija/paper-rousseau.pdf[Accessed On: August 23, 2011]

[10] M. R. Kropf, D. T. Robinson, and S. Viswanathan, "Valuation waves and merger activity: The empirical evidence," *Journal of Financial Economics,* vol. 77, pp. 561–603, 2003.

[11] W. F. Shughart and R. D. Tollison, "The random character of merger activity," *The RAND Journal of Economics*, vol. 15, no. 4, pp. 500-509, 1984.

[12] M. Motta, and M. Ruta, "A political economy model of merger policy in international markets," *CEPR Discussion Paper,* no. 6894, London, U.K., 2008.

[13] J. Dunning, International Production and the Multinational Enterprise. London, *U.K.: Allen and Unwin,* ch.8, pp. 127-135, 1981.

[14] W. Keller, "International technology diffusion," *Journal of Economic Literature,* vol. 42, no. 3, pp. 752–782, 2004.

[15] R. E. Caves, "Mergers, takeover and economic efficiency," I*nternational Journal of Industrial Organization*, vol. 7, pp. 151-175, 1989.

[16] S. Chatterjee, "Excess resources, utilization costs and mode of entry," *Academy of Management Journal*, vol. 33, pp. 780–800, 1990.

[17] J. Yagil, "Mergers and macroeconomic factors," *Review of Financial Economics,* vol. 5, no. 2, pp. 181–190, 1996.

[18] B. S. Black, "Is this the first international merger wave?" *M&A Lawyer,* July/August 2000, pp. 20–26, 2000.

[19] Reserve Bank of India, "Table 170: Consumer Price Index – Monthly," 2012. [Online]Available: http://www.rbi.org.in/scripts/PublicationsView.aspx?id=13760 [Accessed On: April 18, 2012]

Partha S. resides in India and born on 19th August. 1976. Author is graduated in mechanical engineering from NIT, Surat and now research scholar in finance is interested in merger and acquisition, portfolio management and investment sciences. He has 8 years of industry experience and last company was HSBC, India. Mr. Sen is student member of IAI, India and Sun certified java programmer.