The Effect of ADR & GDR Listing on Shareholder's Wealth: Evidence from India

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Abstract

During the period January 2000 to December 2007, seventy nine companies raised capital through the ADR/GDR issues 99 times. This paper looks at the impact of ADR/GDR listing on shareholders wealth. Using an event study methodology and for the sample consisting of 13 ADR and 86 GDR listings the present study finds that ADR/GDR listing negatively effects shareholders wealth. The present study indicates that the potential drawbacks outweigh the benefits in international listing in Indian markets in the short run.

Keywords: ADR, GDR, event study, shareholder's wealth, cross listing

1. Introduction

The return distribution of a stock is dependent on a number of factors. These factors could be industry specific, firm specific or they could even be external factors. Market liquidity, shareholder base and market micro structure are some of the external factors that affect the return distribution of the stock.

Cross listing of stocks, issuance of American Depository Receipts (ADRs) or Global Depository Receipts (GDRs), is another external factor or event that is likely to affect the return distribution of the stock. This change in distribution can be attributed to various reasons like: (i) expansion in investor base, (ii) changes in trading volumes and size, (iii) action of international arbitragers, (iv)increased monitoring and visibility which affect the information flow between the firm and the markets, and (v) greater protection for minority shareholders and access to new capital at lower cost. (Note 1)

Indian firms are increasingly choosing to raise foreign capital by issuing and listing their Depository Receipts (DR). Theoretically, listing of the stocks should help in bringing down the negative effects of the capital market segmentation on the firms' shares listed in the local markets. However, trading on multiple exchanges may cause fragmentation of volumes, as has been pointed out by Amihud et al. (1995). It is even important to understand the effect of cross-listing on the return distribution of the underlying stock. There are several reasons to this aspect. Market efficiency and inter-market information flow has significant implications. Returns generated on a stock tend to influence the decisions of the investors regarding diversification and portfolio rebalancing. From the firm's point of view, foreign listing involves significant initial and maintenance costs as required by their respective exchanges. There are also recurring indirect costs to comply with the reporting requirements and the various regulatory requirements of the foreign country. However, these costs can be justified with the benefits associated with the same. A foreign listing, firstly, increases the shareholder base of the company by being available to the individual and institutional investors of the foreign country. According to Malnak and Sedlisky (1994), the main objective among the US investors in ADRs is to achieve international diversification. This generally results in a shareholder clientele with a long-term perspective. The objective of every firm is to enhance the shareholder's wealth. So it is important to know the effect of cross-listing on the return distribution of the underlying stocks to be able to maximize shareholder's wealth.

India, being an emerging market with intense competition, needs to explore ways to increase the shareholder's value in every possible way. Thus, with the trend of globalization in the Indian capital markets there arises a need to study the various effects triggered by cross-listing. There is a dearth of studies on these lines in the Indian context. Palani-Rajan Kadapakkam and Lalatendu Misra (2003) had carried out a study to find the Return Linkages between Dual Listings under Arbitrage Restrictions. The outcome of the study was that GDR returns have a significant but

small effect on subsequent returns of the underlying stocks, with more liquid GDRs having a slightly greater impact. On similar lines Manoj Kumar and S.M Saudagaran (2002) had carried out a similar study to explore the effect of cross listing on the volumes of the domestic firms. Their finding was that while ADRs listing in most cases decrease the liquidity of the domestic underlying shares, GDR listings in most cases increase the liquidity of the domestic underlying shares. However, their sample is too small to effectively draw conclusions. We are not aware of any study to investigate the impact of, both, ADR and GDR listing on the returns of the underlying stock. In this study, we try to bridge this gap by studying the effect of the DR listings on the returns of the stock.

Rest of the paper is organized as follows. Section 2 looks at previous literature of ADR/GDR Listings. Section 3 discusses the data. Section 4, the event study methodology and hypothesis. Empirical results are discussed in Section 5 and finally Section 6 concludes.

2. Literature Review

The shrinking of the borders in the financial markets has seen an increase in cross-listing by firms in the emerging capital markets, like that of India. The cross-listing has augmented the current investor base of the firms. The popular vehicles used for cross listing American Depository Receipts (ADRs) and Global Depository Receipts (GDRs). This integration of the equity markets has invited the attention of researchers on the impact of such listing on the information environment and its effect on the shareholder's wealth.

There have been a host of studies providing empirical evidence on the effect of international listing on the risk, return and liquidity of the underlying stock. Initial work in this area was carried on by Stapleton and Subrahmanyam (1977). They pointed out that cross-listing helped reduce the degree of segmentation, in the emerging markets, which in turn reduced the cost of capital and lead to the increase in the firm's value. A similar study was carried out by Alexander, Eun and Janakiramanan (1987) and Errunza and Losq (1985), which reinforced the results of the previous study. Their study pointed out that, stock prices would not have been affected if there had been no barriers between markets. Their model depended on the presence of restrictions such as taxes, transactions and information costs that result in segmented markets. If a firm is able to reduce any of the above costs it effectively reduces the cost of capital and increases the shareholder's wealth.

Pagano (1989) in his study explained that the cross listing of a firm's shares added value unequivocally. Again, Chowdhry and Nanda (1991) used the model of Admati and Pfleiderer (1998) to show that one of the markets would emerge as the dominant market, which would attract the informed and liquidity traders. Hence, the volume of trade in the domestic market could decline. Therefore, it is not very clear if firms are better off having raised foreign capital or not. This ambiguity raises the need for further exploration into the topic and has been a cause of motivation for this study.

Foerster and Karolyi (1993) identified that Canadian firms on the US Markets experienced an increase in their share prices before and on the day the shares were listed, while the share prices declined over a period of three months. The increase in share price was attributed to increase in the demand of the shares due to the international listing, which ultimately added value to the firm.

Jayaraman et al (1993) in his research, pointed out that ADR listing increases the variance of the domestic stock's return distribution. The study was carried out on a sample of underlying European and Asian stocks. The increase in the returns, as found in the study, was attributed to the active involvement of the informed traders both in the domestic and the international market.

Baker *et al*. (2002) documented, that following the international listing, greater attention was received by the firm from media as well as analysts who form the investment community. They, also, brought to light that the risk, measured in terms of beta of the stock, declines and hence the cost of capital of the firm , following the listing of non-US stocks in the New York Stock Exchange (NYSE), also declines.

Miller (1999) and Foerster and Karolyi (1999), in their event study, found that abnormal returns in the underlying domestic stocks surround the international listing date. The foregoing empirical evidence is indicative of the impact of international listing on the stock in the domestic market. In a recent study, Foerster and Karolyi (2000) reported that the underlying stock's market beta with respect to the home market index declined substantially post international listing. They also pointed out that the stock's global beta with respect to the world market index did not change substantially.

The above studies have predominantly been carried out in the international markets. There is a dearth of evidence and research on the same lines in the Indian context. Hence, in our study we try to bridge this existing gap by

analyzing the effect on returns of the cross listed (ADRs & GDRs) Indian stocks. This study is an attempt to know the effect of cross-listing on the shareholder's wealth in terms of the return generated.

3. Data

We consider all the ADR and GDR issues of the NSE listed stocks from January 1st 2000 to December 1st 2007. In total the CMIE prowess database had 116 listings meeting our criteria. One stock could have multiple issues/listings as companies can raise the capital many times. However due to non availability of data for the analysis we lost around 17 issues. The final sample consists of 79 unique companies with a total of 99 issues. Table 1 reports the sample of stocks considered for the study listed on NSE. Of the 99 listings, 13 have ADR listings and 86 have GDR listings.

Table 1. List of ADR/GDR Issues During the period January 2000 to December 2007

Name	Event Date	Security Amount (Rs. 10 Millions)	Security Type
A C C Ltd.	9-Mar-04	158.4	GDR
Aftek Ltd.	29-Jan-03	71.65	GDR
Alps Industries Ltd.	27-Mar-06	97.25	GDR
Amtek Auto Ltd.	22-Nov-04	310.7	GDR
Apollo Hospitals Enterprise Ltd.	8-Jul-05	283.9	GDR
Aptech Ltd.	29-Oct-03	65.11	GDR
Arvind Mills Ltd.	11-Jul-05	167.34	GDR
Axis Bank Ltd.	15-Mar-05	1039.87	GDR
Axis Bank Ltd.	27-Jul-07	876.21	GDR
B S E L Infrastructure Realty Ltd.	12-Apr-06	92.25	GDR
Bajaj Hindusthan Ltd.	11-May-05	260.41	GDR
Bajaj Hindusthan Ltd.	27-Jan-06	664.42	GDR
Ballarpur Industries Ltd.	13-Nov-03	158.62	GDR
Balrampur Chini Mills Ltd.	28-Jan-06	220.7	GDR
Bharat Forge Ltd.	14-Apr-05	435.8	GDR
C E S C Ltd.	27-Sep-05	176.06	GDR
Centurion Bank Of Punjab Ltd.	29-Mar-05	306.24	GDR
Centurion Bank Of Punjab Ltd.	6-Apr-05	43.75	GDR
Cipla Ltd.	10-Apr-06	759.9	GDR
Crest Animation Studios Ltd.	31-Jan-04	26.3	GDR
Crew B O S Products Ltd.	21-Jul-05	21.65	GDR
Dhampur Sugar Mills Ltd.	23-Mar-06	239.23	GDR
Dr. Reddy'S Laboratories Ltd.	11-Apr-01	620.25	ADR
Dr. Reddy'S Laboratories Ltd.	16-Nov-06	903.4	ADR
Dr. Reddy'S Laboratories Ltd.	29-Nov-06	130.08	ADR
Dwarikesh Sugar Inds. Ltd.	23-Dec-05	54.38	GDR
Elder Pharmaceuticals Ltd.	30-Apr-04	54.64	GDR
Electrosteel Castings Ltd.	1-Oct-05	154.31	GDR
Emco Ltd.	23-Jun-05	43.53	GDR
Essar Oil Ltd.	1-Apr-05	903.65	GDR
Essar Oil Ltd.	28-Nov-06	352.5	GDR
Eveready Industries (India) Ltd.	25-Nov-05	151.69	GDR
Federal Bank Ltd.	26-Jan-06	358.84	GDR

Financial Technologies (India) Ltd.	5-Oct-07	453.09	GDR
Gammon India Ltd.	22-Dec-04	52.67	GDR
Gammon India Ltd.	24-Jan-06	384.62	GDR
Gateway Distriparks Ltd.	12-Dec-05	384.62	GDR
H D F C Bank Ltd.	20-Jul-01	813.11	ADR
H D F C Bank Ltd.	20-Jan-05	1140	ADR
H D F C Bank Ltd.	18-Jul-07	2443.38	ADR
Hexaware Technologies Ltd.	26-Jul-00	334.49	GDR
Himachal Futuristic Communications Ltd.	4-Sep-02	242.67	GDR
Himatsingka Seide Ltd.	12-Dec-05	273	GDR
Hindustan Construction Co. Ltd.	29-Mar-06	446.6	GDR
I C I C I Bank Ltd.	28-Mar-00	763.35	ADR
I C I C I Bank Ltd.	2-Dec-05	2301.27	ADR
I C I C I Bank Ltd.	25-Jun-07	10014.82	ADR
I L & F S Investsmart Ltd.	14-Dec-05	463.69	GDR
Ind-Swift Laboratories Ltd.	11-Aug-05	46.5	GDR
India Cements Ltd.	14-Oct-05	496.9	GDR
Indiabulls Financial Services Ltd.	24-Feb-05	262.03	GDR
Indiabulls Financial Services Ltd.	4-Aug-05	648.6	GDR
Indiabulls Financial Services Ltd.	15-May-07	1226.09	GDR
Indiabulls Real Estate Ltd.	10-Jul-07	1623.21	GDR
Indusind Bank Ltd.	30-Mar-07	147.45	GDR
J K Paper Ltd.	30-Mar-06	53.63	GDR
Jindal Saw Ltd.	15-Sep-05	284.59	GDR
Jindal Saw Ltd.	17-Oct-05	43.73	GDR
K L G Systel Ltd.	4-Sep-06	34.82	GDR
K R B L Ltd.	24-Feb-06	53.34	GDR
K Sera Sera Productions Ltd.	2-Nov-07	47.61	GDR
Kotak Mahindra Bank Ltd.	19-Apr-06	450.9	GDR
L I C Housing Finance Ltd.	27-Aug-04	138.36	GDR
Larsen & Toubro Ltd.	13-Nov-07	1575.6	GDR
Lloyd Electric & Engineering Ltd.	11-Oct-05	127.4	GDR
Lyka Labs Ltd.	29-Nov-05	23.08	GDR
Maars Software International Ltd.	4-Dec-03	60	GDR
Man Industries (India) Ltd.	22-Mar-06	155.54	GDR
Micro Inks Ltd.	5-Nov-04	180.83	GDR
Morepen Laboratories Ltd.	30-Mar-03	72.5	GDR
Moser Baer India Ltd.	31-Mar-04	493.92	GDR
Nagarjuna Construction Co. Ltd.	14-Dec-05	479	GDR
Noida Toll Bridge Co. Ltd.	21-Mar-06	208.01	GDR
Orchid Chemicals & Pharmaceuticals Ltd.	28-Oct-05	182.8	GDR
Patni Computer Systems Ltd.	1-Dec-05	576.22	ADR
Pentamedia Graphics Ltd.	16-Jul-01	89.65	GDR
Pentamedia Graphics Ltd.	11-Feb-02	70.11	GDR

Pentamedia Graphics Ltd.	29-Nov-02	114.37	GDR
Pentamedia Graphics Ltd.	11-Jun-03	75	GDR
Rana Sugars Ltd.	15-May-06	81.13	GDR
Ruchi Soya Inds. Ltd.	1-Mar-06	266.1	GDR
S R E I Infrastructure Finance Ltd.	18-Apr-05	153.21	GDR
S S I Ltd.	23-Mar-00	435.96	GDR
Satyam Computer Services Ltd.	16-May-01	759.95	ADR
Shah Alloys Ltd.	14-Sep-06	30.21	GDR
Shreyas Shipping & Logistics Ltd.	15-Feb-06	35.42	GDR
Soma Textiles & Inds. Ltd.	20-Oct-06	96.86	GDR
Sterling Biotech Ltd.	1-Oct-03	69.86	GDR
Sterlite Industries (India) Ltd.	19-Jun-07	8205	ADR
Tata Tea Ltd.	2-Mar-00	326.71	GDR
United Spirits Ltd.	22-Mar-06	579.15	GDR
Usha Martin Ltd.	24-Aug-00	52.25	GDR
Usha Martin Ltd.	24-Oct-05	112.85	GDR
Uttam Galva Steels Ltd.	29-Mar-07	86.33	GDR
Vaibhav Gems Ltd.	12-Oct-07	94.54	GDR
Videocon Industries Ltd.	28-Jun-05	325.76	GDR
Videocon Industries Ltd.	8-Jul-05	409.57	GDR
Videocon Industries Ltd.	30-Sep-05	1260.02	GDR
Wipro Ltd.	19-Oct-00	605.94	ADR

The study is an event study. The event for this purpose is defined as the issue of the ADR or GDR of the particular stock. The event day would be the day on which the ADR or GDR listing was done. The period of review for this study is 10 days before and after the occurrence of the listing event. This actually helps in reducing noise created by other unrelated events in the domestic market. The next step is to compute the normal returns on other days and comparing it with the returns generated around the period of review. Any return in excess of the normal return is abnormal return.

It has been found that abnormal return estimators often are cross-sectionally (in event time) correlated, have different variances across firms and are not independent across time for a given firm. To reduce this error the event dates have to be randomly scattered across the calendar dates and also the firms chosen are random. This is the case in our study. The period under review is 2000 to 2007. Out of the 99 listings 95 event dates are unique and non-overlapping. Also the event dates are spread across the period of the study. The data pertaining to the dates of cross-listing and the stock prices in the domestic market has been collected using the CMIE prowess database.

4. Event Study Methodology

Brown and Warner (1985) lay the methodology to be followed in event studies using daily returns. Event study tests are joint tests of whether abnormal returns are zero and of whether the assumed model of expected/normal returns (Market Model) is correct. The validity of these assumptions is an empirical question. To solve this problem Brown and Warner (1985) did large scale simulations on actual security returns to determine the validity of various models. Much of the general properties of event studies come from such large scale simulations. Large scale simulations make it easier to study test statistic specification and the power of the tests. Based on these tests Brown and Warner (1985) provide evidence that market model is both well specified and powerful in event study methodology under a variety of conditions. (Note 2)

It was found that abnormal return estimators often are cross-sectionally (in event time) correlated, have different variances across firms and are not independent across time for a given firm. However these problems are minor in the context of event study and have been addressed in the literature. For instance, cross-sectional dependence is not a problem when the event periods are randomly dispersed through calendar time, that is, the event dates are not clustered. Cross-sectional dependence will be a minor problem, when event time is the same as calendar time but

securities are randomly chosen (from different industries) and market model abnormal return estimates are used (as opposed to the mean- or market-adjusted abnormal returns discussed above). Similarly, when the event period is short, relative to the estimation period, time series dependence in the average abnormal returns will be unimportant (Binder (1998)). (Note 3)

According to the market model, the return of a stock is linearly related to the return of the market and is given by.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{1}$$

$$E(\varepsilon_{it}) = 0 \ ; \ Var(\varepsilon_{it}) = \sigma_{ei}^2$$

where R_{it} and R_{mt} are period 't' returns of the security 'i' and the market portfolio respectively in the estimation window. ε_{it} is a zero mean disturbance term with constant variance over 't'.

In order to investigate if option listing induces any abnormal returns for each stock on each day in the event period, the actual returns in the event window are compared with the Market Model predicted returns in the event window. The difference between these two returns is interpreted as the abnormal return of a stock and is given by

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}) \tag{2}$$

where $\hat{\alpha}_i$ and $\hat{\beta}_i$ are ordinary least squares estimates from the estimation period using the market model. R_{it} and R_{mt} are the returns (ex post returns) of the security 'i' and the market portfolio respectively for period 't' in the event window.

In order to make statistical inferences average abnormal returns (AAR) and cumulative average abnormal returns (CAAR) are calculated as follows.

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \tag{3}$$

where 'N' is the number of stocks whose abnormal returns are available on day 't' in the event window('t'=0 is the event date that is the date on which an announcement has been made that option is being listed in more than one exchange). If the event window is (-5 to +5) then 't' will take values from -5 to +5

$$CAAR_k = \sum_{t=1}^{k} AAR_t \tag{4}$$

where 'k' is the number of days we want to cumulate over the event window.

To compute the t-statistic, first all abnormal returns are standardized as follows.

$$SAR_{it} = \frac{AR_{it}}{S_i(AR)} \tag{5}$$

where, $S_i(AR)$ is the standard deviation of the abnormal returns of stock 'i' in the estimation period.

The cumulative abnormal returns are also standardized as follows.

$$SCAR_{ik} = \left(\sum_{t=1}^{k} SAR_{it}.\right)\frac{1}{\sqrt{k}} \tag{6}$$

where 'k' is the number of days we want to cumulate in the event window.

The t-statistic for the sample of N stock for each day 't' in the event window is calculated as follows.

$$\text{t(SAR)} = \left(\sum_{i=1}^{N} SAR_{it}\right).\frac{1}{\sqrt{N}} \tag{7}$$

$$\text{t(SCAR)} = \left(\sum_{i=1}^{N} SCAR_{ik}\right).\frac{1}{\sqrt{N}} \tag{8}$$

Also, the cumulative average abnormal returns were calculated to see the effect on the abnormal returns for the holding period for the period under review.

The above tests assume about the distribution of abnormal returns which may or may not hold good. We also employ sign test to find out if the abnormal returns are positive or negative. It assumes that abnormal returns are not cross

correlated and tests the hypothesis that half of abnormal returns are negative. The test statistic for the one sided sign test is given as

t_{sign} =(P-0.5)/ Sqrt(0.25/N) where P is the proportion of stocks with positive abnormal returns.

5. Results

As can be seen from Table No 2, out of 21 days only in two days the percentage of stocks with positive abnormal returns is above 50 percent, all the other days the percentage of positive returns is well below 50 percent. Also the sign test is consistently negative from day 0 to day +10 and statistically significant at more than 95% level from day 0 to day +10. On 12 days the sign test shows statistically significant negative abnormal returns where as not on a single day the positive abnormal return is statistically significant. The Average Abnormal Return (AAR) on day 0 and -1 is -0.77 percent and -0.69 percent respectively and statistically significant at the 95% level. The return on day 1 turns positive and is statistically significant but the sign test shows otherwise. Over all the average abnormal returns under consideration has predominantly given negative returns except on day 1 where the abnormal returns are positive. Also, the Cumulative Average Abnormal Return (CAAR) for the period (-10,+10) is -2.96 percent and statistically significant indicating that investors invested for the period would have lost -2.96 percent during the period. It could also be interpreted that the market capitalization on an average for the sample companies would have declined by 2.9%. Event window (-5,0) is also negative and statistically significant. Table 3 reports the cumulative average abnormal returns (CAAR). These results bring to forth the fact that the cross listing of the stock do have a significant negative impact on the share prices as a result of which the shareholder's wealth is affected.

Table 2. Average Abnormal Returns (AAR) in the event period

Relative day	**Number of Stocks**	**Average Abnormal Returns(AAR)**	**T-stat**	**Per Cent (%) Positive**	**T-sign**
-10	99	0.33%	1.00	49.50%	-0.10
-9	99	-0.52%	-1.63	34.34%	-3.12
-8	99	-0.53%	-1.52	40.40%	-1.91
-7	99	0.02%	-0.53	45.46%	-0.90
-6	99	0.01%	-0.22	40.40%	-1.91
-5	99	-0.04%	0.30	44.44%	-1.11
-4	99	0.47%	1.24	54.55%	0.90
-3	99	-0.46%	-1.82	44.44%	-1.11
-2	99	-0.26%	-0.91	45.46%	-0.90
-1	99	-0.69%	**-2.31**	40.40%	-1.91
0	99	-0.77%	**-2.19**	28.57%	**-4.81**
1	99	0.89%	**2.76**	35.71%	**-3.21**
2	99	0.42%	1.34	38.10%	**-2.67**
3	99	-0.39%	-1.29	32.54%	**-3.92**
4	99	-0.19%	-0.20	30.16%	**-4.45**
5	99	-0.09%	0.18	30.16%	**-4.45**
6	99	-0.15%	-0.30	33.33%	**-3.74**
7	99	-0.03%	-0.30	30.95%	**-4.28**
8	99	-0.30%	-0.96	31.75%	**-4.10**
9	99	-0.58%	-2.01	26.98%	**-5.17**
10	99	-0.09%	-0.43	33.33%	**-3.74**

Table 3. Cumulative Average Abnormal Returns (CAAR)

Event Window	Number of Stocks	CAAR	T-test	PERCPOS	tsign
(-10,10)	99	-2.96%	-2.14	26.19%	-5.35
(-5,5)	99	-1.11%	-0.87	30.95%	-4.28
(-5,0)	99	-1.61%	-2.11	30.15%	-4.54

6. Conclusions

From the above study we can conclude that there is a significant negative impact on stock returns due to ADR/GDR listings. The results could be explained if there is a decrease in liquidity in the domestic stocks, as found by Manoj Kumar and Saudagaran(2002), the transaction costs are likely to escalate. An increase in the transaction cost would inevitably affect the returns adversely, which has been highlighted in our study by negative Average Abnormal Returns.

However, from the firm's point of view, cross-listing has numerous advantages like increase in transparency, increase in the investor base, international exposure and global linkages. Though the stock returns are not statistically significant, investors stand in a better stead because internationally listed companies are rated high on corporate governance practices and investor relations. Further research in this area could explore these relations and also to look at the long term effects of shareholders wealth.

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Notes

Note 1. V. T. Alaganar and Ramaprasad Bhar: "Impact of International Listing on Return Distribution" Journal of the Asia Pacific Economy 9(1) 2004: 101–117

Note 2. Kothari and Warner (2004) reviews both long and short horizon event studies. Pamela P. Peterson (1989) and Glen V. Henderson (1990) review problems and solutions in conducting event studies.

Note 3. Binder (1998) reviews the event study methodologies since 1969 and statistical problems encountered and solutions offered in the literature. Lo, AW and MacKinlay, AC (1997) reviews event studies and its application in economics and finance.