International Listing and Stock Returns: Evidence from Emerging Economies

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Abstract

The paper examines the impact of American Depositary Receipt (ADR) listings on the return of underlying domestic stocks of six emerging markets from Asia and Latin America and they are India, Korea, Hong Kong, Brazil, Argentina and Mexico. Average abnormal returns and cumulative average abnormal returns are calculated for the [–100, +100] event window, with the ADR listing date being the event date. The results indicated a significant positive abnormal local market returns on an ADR listing day. However the overall sample seems to be adversely affected by the international listing during the post-listing period. The study also compared the long-term performance of domestic and international market returns of the underlying shares and found insignificant difference between the returns of two markets and the market segmentation hypothesis holds good in all the stocks of six countries and it occurs due to the differences in the prices of ADRs and underlying domestic shares so ADRs are trading at premium.

Keywords: Emerging Markets, American Depositary Receipt, International Listings, ADR Premium

JEL Classification: F3, G14, G15

1. Introduction

The internationalization of financial markets has gained drive during the last two decades and all the emerging markets are globalizing their capital markets. Emerging markets can be more dynamic and faster growing than developed markets. An emerging market is a country listed by the World Bank as having low to middle income levels per person, or, as being a country with an underdeveloped stock market. The emerging capital markets often suffer from low liquidity, insufficient regulation, institutional weakness, and weak shareholder protection. All these features apply to the six stock markets of Asia (India, Hong Kong, Korea) and Latin America (Argentina, Brazil, Mexico) under the study. The objective of this paper is to test the hypothesis of positive benefits of cross-listing effect on the companies after going internationally listed. Cross-listing or international listing refers to a firm having its equity shares listed on one or more foreign exchanges, in addition to the home country stock exchange. Theory suggests that stock prices from firms that cross-list from segmented markets with investment barriers can be expected to rise, while their subsequent expected returns should fall as an additional built-in risk premium for these barriers disappears (Hargis and Ramanlal, 1998). The reasons for international listings have been pointed out by the various researchers like McGoun (1987), Foerster and Karolyi (1999), Jayaraman et al. (1993) and one of the prominent benefits is increase in returns due to international cross-listing. The researchers suggested that international listings help in achieving a fair valuation for the firms by improving the trading efficiency of their shares listed on the domestic stock exchanges. If the above perception of the researchers is true that means

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international listings should have positive impact on the prices of domestically listed stocks of the foreign listed firms. Therefore, the research questions addressed in this paper were: *Does the international listing of shares affects the returns available from the underlying domestic shares of cross-listed firms? And secondly, comparison of the domestic and international market returns of cross-listed firms and finally the calculation of ADR premium*. The paper is divided into four sections: a literature review, a description of the data and empirical methodology used in estimation of abnormal returns, and a presentation of the empirical results and conclusions.

Review of Literature

One of the first empirical evidence for existence of cross-listing effect was found by McGoun (1987) who studied US firms listed on in Toronto, Tokyo, and London and found a positive share price reaction to the announcements of foreign listings and a negative post-listing return pattern for the firms in his sample. Similarly Alexander et al. (1988) used two sets of data i.e. Canadian and non-Canadian companies, and found that the returns for cross-listed securities are lower than for securities listed only on one exchange. Foerster and Karolyi (1999) investigated 153 foreign companies that were listed their shares in the U.S. and found that the abnormal returns around such listings to be consistent with improvement in investor recognition as well as the greater liquidity which were the result of U.S. listing. Further Miller (1999) showed that the stock price reaction to a cross-listing is positively correlated both to the increase in the shareholder base and to the barriers to capital flows. The abnormal returns are largest when companies list on major US exchanges and when they originate from emerging markets.

Sadeghi (2001) studied the impact of dual listing of Australian shares on the New Zealand Stock Exchange and documented that the average excess return on the day of listing is statistically insignificant and negative. They further stated that "negative excess return starts to accumulate before the day of listing and becomes statistically significant several weeks after this date to the end of the period i.e. (day +150)". Hertzel et al. (2000) viewed positive abnormal returns associated with filling effect of financial statements with SEC. Korczak and Lasfer (2005, 2008) revealed that in the post-event period the cumulative abnormal returns are positive and significant for both domestic and cross-listed firms, but they are statistically higher for the domestically-listed companies. For the sell trades, the post-event cumulative abnormal returns are not statistically significant for the cross-listed firms, but they are negative and significant for domestically-listed companies.

According to signaling theories, international listing of company equity to a foreign exchange market convoys a signal to the market. The strength of the signal either is positive or negative. Martell et al. (1999) examined the risk and returns of shares of Latin America after ADR listing in U.S market and revealed that positive returns exist and there are no systematic changes in the return variances. It contradicts the results of Jayaraman et al. (1993) and Makhija and Nachtmann (1990), who also found significant increase in variance of returns after ADRs issue. While Admati and Pfleiderer (1988) predicted that returns are more volatile when trading is larger, because both informed and liquidity traders prefer to trade when volume is large. Serra (1997) studied the effects on stock returns of dual-listing on an international exchange with a sample of 70 firms from 10 emerging markets over the period of 1991-1995. The results of the study showed that there was a significant positive abnormal return before listing after listing there was a significant decline.

Typically the studies that examine abnormal returns associated with foreign cross-listings tend to find negative post-listing performance. Ule (1937) examined all the stocks that are cross-list on the NYSE between 1934 and 1937 and founds that stock prices prior to cross listing yield a positive large return to shareholders. Likewise, Merjos (1963) investigated a sample of new cross-listings on American stock exchanges (ASE) on four different dates, and three months before cross listing to one month after the cross listing and documented that stock prices outperform the stock index with a decrease in stock price observed after the cross-listing. While Van Horne (1970) suggested that cross-listing is not 'a thing of value' nor could it be profitable activity for investors to buy stocks at the cross-listing announcement date and sell them at the actual cross-listing date.

Pasquariello et al. (2005) studied all the ADR issuances in the U.S. stock market in the last 28 years and found that the cumulative abnormal returns of local currencies increased before ADR issues and decreased after ADR issues. They also explored the relationship between the likelihood and clustering of ADR issuance activity and

past and future currency returns. The results depicts that the non-U.S. companies shows economically and statistically significant timing ability in the corresponding exchange rate markets over and above the timing ability in local and U.S. stock markets. They said that firms tend to issue ADRs after their local currency has been abnormally strong against the U.S. dollar, and before their local currency becomes abnormally weaker. They have further examined what kind of issuances and firms are more likely to time the exchange rate market and they found that market timing is largely determined by big issues by small firms, firms of low Tobin's q, and by firms in export-oriented industries. They found the effect of the exchange rate on market valuations in the issuing currency is more important and make them more selective in choosing the timing of an ADR issue.

Wang et al. (2008) revealed that there were no significant abnormal returns for the Asian companies before cross-listing but there were significantly negative abnormal returns after cross-listing. Pursiainen (1998) concluded that cumulative abnormal returns turned out to be negative after listing. Further stated that multi-listing has either neutral or negative impact on shareholder value with statistically insignificant but negative t-values. Subsequently, as reviewed by Kumar (2003) in his study that Torabzadeh et al. (1992), Lee and Varela (1993) and Riach (1999) found either slightly positive or neutral market reactions in the listing month. Similarly, Gerasymenko (2009) examines the returns of Ukrainian stocks following ADR listings and founds an insignificant positive abnormal local market return on the ADR listing day. Aybar (2001) studied a sample 143 privatized related ADRs' long-run performance between the periods 1984 to 1999. The study revealed that average cumulative returns and average cumulative abnormal returns of developed country privatizations exceeded emerging market privatization returns.

Several empirical studies documented important findings about the ADR market. Rosenthal (1983) using time series of weekly, biweekly, and monthly rates of return over the time period of 1974 through 1978 for 54 ADRs and found that the ADR market was weak-form efficient. That is, abnormal trading profits are not present. While Park (1990) found that a substantial portion of the variability in ADR returns is accounted for by variation in the share price of the underlying security in the home market. Officer and Hoffmeister (1987) and Kao et al. (1991) examined ADRs as vehicles for constructing diversified equity portfolios as reviewed by Eun and Resnick (2008). Rodrigues (1999) studied the Brazilian market returns and found that average daily excess returns for that portfolio are equal to 0, 12%, before the event, and –0, 02% after the event.

Lau et al. (1994) examined valuation effects of international stock exchange listings of US companies. Their sample includes 346 listings by US firms from eight countries from 1962 to 1990 on all the major European exchanges, as well as the Toronto and Tokyo stock exchanges. They suggested that the announcement of foreign stock listings is associated with a temporary negative valuation impact. Further there was also a significant negative cumulative average abnormal return over the interval (–5, +3) days around the first trading day. While Howe and Kelm (1987) examined a sample of U.S. firms undergoing their first, second and third overseas listing and analyzed the abnormal returns in the 131 day period surrounding the announcement of the cross listing. They found during this period the negative abnormal returns about –5.1% for the cross listings, thus implying the existence of a high cost to overseas cross listings.

Kutan and Zhou (2006) investigated the determinants of returns of Chinese ADRs in NYSE and found that underlying, local and host all the markets are important determinants of the returns. The study revealed that the underlying market have a significant impact on the volatility of the ADRs while host market and local market shocks do not affect the volatility of the ADRs. The study further depicted that there is a negative correlation between ADRs and U.S market returns. The results of the study is similar to the previous researches of Kim et al. (2000) who suggested that underlying shares are the most important factor in pricing of ADRs. While in the main findings of Berggrun (2005) suggested that in the short run, the underlying share price seems to adjust after changes in the ADR price, pointing to the fact that the trading market for the ADR that is NYSE leads the Colombian market. However, in the long run, both, the underlying share price and the ADR price, adjust to changes in one another. Similarly, the domestic market of Israel turned out to be the dominant one for the Israel ADRs in respect of the foreign market of the US (Lieberman et al., 1999). Perotti and Cordfunke (1997) concluded that in the case of Dutch companies foreign listing has increased the shareholder wealth. On the day of listing there is an increase in value

of 0.68 % for all companies and the cumulative return is 1.38 %. The stock price increase seems to be permanent and there are insignificant abnormal returns following the announcement. They also revealed that foreign listing may decrease barriers to capital flows and reduce the costs of capital for firms. They also said that NYSE listing results in greater internationalization of the shareholder base and it may result in an increased amount of transparency and disclosure.

Jithendranathan (2005) studied the price relationships between Russian Depositary Receipts (DRs) and the underlying Russian equities as well as the changes in trading volume of these DRs in different markets over the time. The results indicated that there was no premium/discount between the Russian DRs and the underlying stocks and the cross-listed stock returns are highly correlated with the returns of local equity. The study further concluded that local markets have little significant effect on Russian DR returns. With the data of 30 stocks in the Dow Jones Index Hasbrouck and Seppi (2001) analyzed commonalities in order flows and returns for 1994 and said common factors exist between both of them.

Tribukait (2005) analyzed the asymmetries in stock price reaction due to earnings news before the public announcements, before and after firms issue exchange-listed ADRs. He found that on announcement dates prices react strongly to earnings news following ADR listings this is due to a reduction in private information leaking into prices ahead of important corporate announcements. If this drift is related to insider trading and the pre-announcement drift should be significantly reduced following ADR listings because and ADRs effectively enhance investor protection. So the reduction in price should be stronger in the countries with poor investor protection. Froot et al. (2001) also found a correlation between flows and returns, as well as effects that they infer from private information and found that the effect is more on emerging markets rather than in the developed markets. While Freedman (1989) said "increase in variance is connected to more private information acquired by informed traders after the cross-listing".

Another important issue of international cross-listing is market segmentation. Segmentation Hypothesis affirms shareholders benefit from international listing of firms in a segmented capital market. Investors demand a high-risk premium for investing in a segmented capital market because of prevailing direct and indirect barriers by the governments of both the countries. In view of this Stapleton and Subrahmanyam (1977) argued that the international listings can help in reducing these barriers to investing. In a resulting mildly segmented market, investors demand less risk premium for trading in the firm's securities. This effect should lower the expected returns and thus generate a higher market price for security (Errunza and Losq, 1989). Listing a company's stock abroad should have no impact on its price when domestic and foreign equity markets are fully integrated. If barriers exist, however, a firm's share value may be affected by the cross-listing announcement. Empirical evidence suggest that shares of cross-listed firms tend to experience abnormally high returns prior to their foreign listing and shortly thereafter. Longer-term performance varies greatly across companies (Chouinard, 2004). Thus it should be noted that the cross-listing produces conflicting results. For example, Howe and Kelm (1987) found negative abnormal returns for the first trading day for U.S. firms listed on foreign stock exchange. In contrast, Reilly et al. (1990) found positive abnormal returns for the U.S. firms listed on the stock exchange in Tokyo.

Research Methodology

The study was empirical and descriptive in nature. The total population of the study includes all the ADR listed companies in NYSE and NASDAQ. The sampling frame was 2000 to 2009. Purposive sampling technique was used to complete the study. The total sample size was 21 companies from India, Hong Kong, Korea, Argentina, Brazil and Mexico. The secondary data of stock & index prices were collected from the official website of BSE, NYSE, NASDAQ and Yahoo Finance.

Techniques for Data Analysis

- Returns are calculated as follows:
- The daily returns or actual returns of the stocks were computed by logarithmic returns using MS Excel and the inferential statistics was computed with the help of SPSS 16.

$$R_{jt} = 100 * \ln (P_{jt} / P_{jt} - 1) \quad (1)$$

Where,

R_{jt} = daily mean return percent from the j security, P = price of stock, t= current day, $t - 1$ = the immediate preceding day.

Table 1. List of Sample Firms Which Are Listed through ADRs

S. NO.	*DR ISSUE*	*SYMBOL*	*EXCHANGE*	*DR RATIO*	*ISSUE DATE*
1	Dr. Reddy's Laboratories	RDY	NYSE	1:1	Apr 24, 2001
2	HDFC	HDB	NYSE	1:3	July 25, 2001
3	ICICI	IBN	NYSE	1:2	Mar 31, 2000
4	Mahanagar Telephone Nigam Ltd.	MTE	NYSE	1:2	Sep 28, 2001
5	Patni Computer Systems	PTI	NYSE	1:2	Dec 07, 2005
6	Satyam Computers	SAY	NYSE	1:2	May 18, 2001
7	Sterlite Industries	SLT	NYSE	1:1	June 22, 2007
8	Tata Communications Ltd.	TCL	NYSE	1:2	Aug 15, 2000
9	Tata Motors	TTM	NYSE	1:1	Sep 27, 2004
10	Wipro	WIT	NYSE	1:1	Oct 24, 2000
11	Shinhan Financial	SHG	NYSE	2:01	Sep 16, 2003
12	Webzen	WZEN	NASDAQ	10:03	Dec19, 2003
13	Hutchison Telecommunications International	HTX	NYSE	1:15	Oct15, 2004
14	Braskem	BAK	NYSE	1:02	Sep17, 2003
15	BRF - Brasil Foods	BRFS	NYSE	1:02	Oct 20, 2000
16	Gafisa	GFA	NYSE	1:02	Mar 21, 2007
17	Petroleo Brasileiro - Com	PBR	NYSE	1:02	Jan 02, 2007
18	Tenaris	TS	NYSE	1:02	Mar 12, 2008
19	America Movil - Series A	AMOV	NASDAQ	1:20	Jul 5,2005
20	America Movil - Series L	AMX	NYSE	1:20	Jul 5,2005
21	Fomento Economico Mexicano	FMX	NYSE	1:10	Feb 11, 2004

Hypothesis

Ho_1 = There is no change in the returns of the underlying stocks due to international listing.

Ho_2= There is no difference in the returns of the underlying stocks of domestic and international market after international listing.

- The time around the listing date are categorized into three distinct periods: estimation period; pre-listing period and post-listing period. During the estimation period, firm's stock prices are presumed to be free from any price impacts of the firm's foreign listing decision. Estimation period extends from 250 trading days before the listing day to the 101 trading days before the listing. The pre-listing period starts 100 days before the listing day to 1 day before the listing. The post-listing period is from 1 day after the listing to 100 days after the listing.

Estimation Period		*Pre-Listing Period*		*Listing Day*	*Post-Listing Period*	
-250	-101	-100	-1	0	+1	+100

- To measure abnormal return a market model for each firm using local stock returns denominated in local currency was estimated using an event study procedure. With the listing date defined as day 0, the market coefficients are estimated in the pre-listing period: day –100 to post–listing period +100 days.

  i. Domestic expected returns are:

$$E(Rjt) = \alpha_j + \beta_j R_{mt} \qquad (2)$$

Where,

R_{mt} = Logarithmic actual market returns, a_j = Intercept and average rate of price change which was not explained by the market returns

$$\beta_j = \frac{n\sum R_{mt}R_{jt} - \left(\sum R_{mt}\right)\left(\sum R_{jt}\right)}{n\sum R_{mt}^2 - \left(\sum R_{mt}\right)^2}$$

ii. The abnormal return, *AR*, for the estimation period of security *j* on a day *t* during the event period is computed as follows. ARs are defined as the differences between the actual ex-post returns and the expected normal returns estimated using the OLS market model of returns.

$$AR_{jt} = \varepsilon_{jt} = R_{jt} - (\alpha'_j + \beta_j' R_{mt}) \quad (3)$$

The calculation of the abnormal returns in the event window is, thus, computed as:

Where, α'_j and β_j' are the estimates obtained from the regression of $R_j t$ on R_{mt} over an estimation period preceding the event window.

i. The abnormal returns on individual stocks are cross-sectionally averaged in event time to calculate the **average abnormal returns** (AARs). It is the average deviation of actual returns of a security from the expected returns. the following model is used for computing the average abnormal returns (AARs):

$$AAR_{jt} = \sum_{j=1}^{N} \frac{AR_{jt}}{N} \quad (4)$$

Where, AR_{jt} = abnormal return for security j

t = trading day relative to the event date,

N = Total number of securities

ii. Finally, to measure the impact of firms' foreign listing decisions around listing date, cumulated **average abnormal returns** (CAAR) for the different holding period were calculated. Over an interval of two or more trading days beginning with day T_1, ending with T_2 , the cumulative average abnormal return is:

$$CAAR = T_1T_2 = \frac{1}{N}\sum_{j=1}^{N}\sum_{t=T_1}^{T_2} AR_{jt} \quad (5)$$

The large sample size allows us to presume the near normal distribution of the returns. As Brown and Warner (1985) showed that the non-normality of daily returns has no obvious impact on event-study methodologies. They provided evidence that the mean abnormal returns in a cross-section of securities converge to normality as the number of securities in the sample increases. They argued that standard parametric tests are well specified for testing significance of the daily abnormal returns.

- The **cumulative average abnormal** returns provide information about the average price behaviour of securities during the event window. If the markets are efficient, the AARs and CAARs should be close to zero. So t-test is applied to determine whether the calculated AR_{jt}, AAR_t and $CAAR\ T_1, T_2$ are statistically different from zero. The 5% level of significance with appropriate degree of freedom was used to test the null hypothesis of significant abnormal returns after the event day. If AAR_t, and CAAR T_1, $T_2 > 0$ and statistically significant, it indicates that the share prices on average reacted positively to the foreign listings and thus increased the wealth of the shareholders. So the conclusions are based on the results of t values on AARs and CAARs for the event window. The *t* statistics for AAR for each day during the event window is calculated as:

$$t = \frac{AAR}{\sigma(AAR)}$$

Where, σ(AAR) = Standard error of average abnormal return

- The *t* statistics for CAAR for each day during the event window is calculated by using the following formula:

$$t = \frac{CAAR}{\sigma(CAAR)}$$

Where, σ (CAAR) = Standard error of cumulative average abnormal return

The standard error is calculated by using the following formula:

$$\text{S.E.} = \frac{\sigma}{\sqrt{n}}$$

Where,

S.E = standard error, σ = Standard deviation, n = Number of observations

- Comparison of the returns of the underlying stock at domestic market with the international market.

  Independent sample T-test was applied to compare the returns of the underlying stocks of domestic and international market for the time period of international listing date to December, 2009.

- ADR premium levels over the underlying domestic share prices

$$\text{ADR premium} = \frac{\text{ADR prices} - \text{Underlying domestic share prices}}{\text{Underlying domestic share price}}$$

- Premium levels were calculated after adjusting the ADR prices for exchange rate and the ADR ratio.

Results and Discussions

I. Abnormal returns for all ADR Listings

To compute the effect of international listing by examining AARs and CAARs for the overall sample of ADR listing constituted of all the ADRs listed on US exchanges from all the countries were taken and some companies had been withdrawn due to non-availability of the data from the database and they were Hutchison, Braskem, BRF-Foods. The AARs and CAARs were calculated for the period from 100 days prior to the listing to 100 days after the listing for each of the sixteen ADR programs in our sample. The results in Table II and Figure I revealed market model with returns CAARs from 100 days prior to the international listing to 100 days after the listing for the overall sample. The figure I depicts that the CAAR were continuously negative and shows up and down patterns.

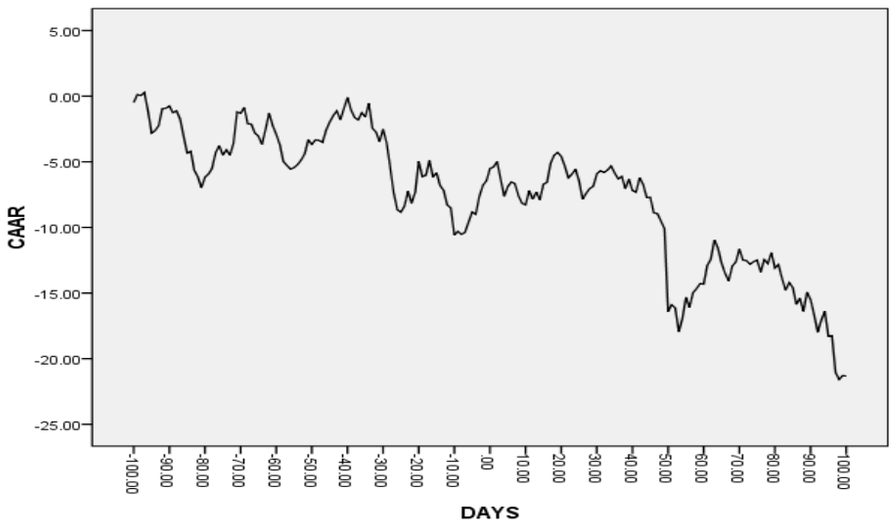

Figure 1 CAARs Results for All ADR Listing

The table II selectively depicts the AARs and CAARs around the foreign listing date. It showed pre-listing increases and post-listing decline in prices of underlying shares. The evidence of pre-listing increase was weak as daily AARs were negative and also insignificant between days -15 and -1 (0.3194 percent with a t-statistic of 0.433). However, insignificant positive daily AARs were revealed between days -3 and -1 (-1.351 percent with a t-statistic of 1.008). Daily AAR becomes significantly positive on the listing day (0.944 percent with a t-statistic of 1.62). And in the post-listing period between days +1 and +100, daily AARs continue to be significantly negative (-0.19 percent with a t-statistic of -4.29).

The CAARs of overall sample exhibits noticeable patterns. The first is a pattern of insignificant price decreases during the -1 to -100-days period prior to the international listing day (-0.48336 percent with a t-statistic of -0.10052). The second was a downward drift from the listing day onwards. The CAARs between days +1 and +80 were insignificantly negative (-1.17577 percent with a t-statistic of -1.76). The above patterns were strange in context to those observed in the previous studies done in context of developed and emerging markets. On the whole, of the 201 days, AARs were negative for 103 days and positive for 98 days while CAARs were negative for 198 days and positive for only 3 days. This resulted in thrice the numbers of positive CAARs than negative CAARs.

The table III showed the comparison of domestic and international market returns and the results showed the insignificant difference between the returns of two markets. Thus both the markets provide the same returns and therefore the study fails to reject the null hypothesis.

Table 2. AARs and CAARs for All ADRs

DAYS	AAR	T	CAAR	T
-100	-0.48336	-0.40217	-0.48336	-0.10054
-90	0.173607	0.214246	-0.74539	-0.22997
-80	0.812405	1.078924	-6.15816	-2.0446**
-70	-0.10042	-0.1371	-1.30187	-0.44436
-60	-0.66489	-0.71815	-2.90508	-0.78444
-50	-0.34548	-0.31085	-3.67501	-0.82667
-40	0.828752	1.66683**	-0.09681	-0.04868
-30	0.952135	1.101852	-2.51375	-0.72726
-25	-0.18256	-0.1645	-8.84619	-1.99272**
-20	2.372555	1.65788**	-4.96398	-0.86717
-15	0.319465	0.433029	-5.8386	-1.97853**
-10	-2.06194	-2.3317	-10.5744	-2.98947*
-9	0.272122	0.409536	-10.3023	-3.87617*
-8	-0.22808	-0.27695	-10.5304	-3.19669*
-7	0.157609	0.164699	-10.3728	-2.70985*
-6	0.798131	0.719119	-9.57466	-2.1567**
-5	0.749093	1.321132	-8.82556	-3.89129*
-4	-0.17144	-0.13577	-8.99701	-1.78126**
-3	1.351485	1.008693	-7.64552	-1.42658
-2	0.850139	1.310756	-6.79538	-2.6193*
-1	0.341641	0.411558	-6.45374	-1.94362**
0	0.943961	1.62134***	-5.50978	-2.36589**
1	0.117914	0.095098	-5.39187	-1.08714
2	0.410123	0.396998	-4.98174	-1.20558
3	-1.33912	-1.72152**	-6.32087	-2.03147**
4	-1.31095	-1.56695***	-7.63181	-2.28054**
5	0.742702	0.701367	-6.88911	-1.62643***
6	0.35112	0.589088	-6.53799	-2.74227*
7	-0.12844	-0.24411	-6.66644	-3.16741*
8	-0.92036	-1.06741	-7.58679	-2.19975**
9	-0.57671	-1.26067	-8.1635	-4.46129*
10	-0.11709	-0.21619	-8.28059	-3.82228*
15	1.190413	2.087488**	-6.70436	-2.93916*
20	-0.3026	-0.49747	-4.58946	-1.88626**
25	-0.88583	-1.37662	-6.45012	-2.50596***
30	0.965617	1.619688***	-5.90303	-2.47538***
40	-0.88054	-0.94543	-7.19419	-1.9311**
50	-6.31082	-0.94999	-16.4072	-0.61746
60	-0.04499	-0.10775	-14.3215	-8.57576*
70	0.995323	1.561786***	-11.6472	-4.56897*
80	-1.17577	-1.76159**	-13.0993	-4.90648*
90	-0.56779	-0.58553	-15.4964	-3.99511*
100	-0.03665	-0.03787	-21.3251	-5.5085*

*1%, **5% and ***10% level of significance

II. Comparison of the Returns of the Underlying Stocks in Domestic and International market

Table 3. Comparison of Domestic Market Returns and International Market Returns

S. NO.	DR ISSUE	T-VALUE	P VALUE	HYPOTHESIS REJECTED/ NOT REJECTED (HO_2)
1	Dr. Reddy's Laboratories	-0.360	0.719	Not rejected
2	HDFC	-0.052	0.958	Not rejected
3	ICICI	0.180	0.857	Not rejected
4	Mahanagar Telephone Nigam Ltd.	0.020	0.984	Not rejected
5	Patni Computer Systems	0.060	0.952	Not rejected
6	Satyam Computers	0.008	0.994	Not rejected
7	Sterlite Industries	0.081	0.936	Not rejected
8	Tata Communications Ltd.	-0.391	0.696	Not rejected
9	Tata Motors	0.001	1.000	Not rejected
10	Wipro	-0.147	0.883	Not rejected
11	Shinhan Financial	0.011	0.991	Not rejected
12	Webzen	-0.395	0.693	Not rejected
13	Hutchison Telecommunications International	0.015	0.988	Not rejected
14	Braskem	-1.204	0.299	Not rejected
15	BRF - Brasil Foods	0.062	0.951	Not rejected
16	Gafisa	-0.062	0.950	Not rejected

S. NO.	DR ISSUE	T-VALUE	P VALUE	HYPOTHESIS REJECTED/ NOT REJECTED (HO_2)
17	Petroleo Brasileiro - Com	0.231	0.817	Not rejected
18	Tenaris	0.136	0.892	Not rejected
19	America Movil - Series A	0.709	0.478	Not rejected
20	America Movil - Series L	0.760	0.447	Not rejected
21	Fomento Economico Mexicano	0.366	0.714	Not rejected

III. ADR Premium Levels Over the Underlying Domestic Share Prices

In countries where there are no constraints to capital flows, investors can earn through arbitrage, i.e. by speculating with the different quotations of the same company, in two countries. "The gap between the price at which the ADR is currently trading and the price of the underlying domestic share offers an arbitrage opportunity to existing shareholders of the company which they could monetise at the time of the offering," added by the banker. Since an ADR represent an ownership interest in its underlying foreign security, the prices of the ADR and the underlying stock should be the same at all times after adjusting for exchange rates. Thus the prices of the same stock in two markets are expected not to differ widely when there are arbitrage possibilities, whereby investors would simultaneously purchase and sell equivalent securities in two different markets in order to make profit from discrepancies in their price relationship. This should be true since, if the price of the ADR is higher than the underlying (after adjusting for exchange rates), an investor would be able to buy it cheaply, convert it back to the underlying stock, and sell it for a higher price in the foreign market. This is what we call an ADR arbitrage, where an investor will arbitrage these differences away and make a riskless profit.

However, there exists a considerable difference in the ADR prices compared with the price of underlying shares and that is known as the ADR premium. Arbitrage opportunities help to diminish the discrepancies in prices, reducing the premium levels. Oftentimes, however, these two prices diverge and the ADR will trade at either a premium or a discount to its underlying stock. Therefore the objective was to find out the ADR premium/discount and analyze whether they represent real riskless arbitrage opportunities. The monthly premia figures were used to compute the various averages, as have been detailed in the following Table IV.

Table 4. Average Monthly Prices and Average Premium in Percentage

COMPANIES	INTER-NATIONAL AVERAGE PRICES	DOMESTIC AVERAGE PRICE	AVERAGE PREMIUM (%)
Dr. Reddy's Laboratories	860.57	887.60	(3.05)*
HDFC Bank	799.782	744.9711	7.357452
ICICI Bank	470.947	446.5326	5.467541
Mahanagar Telephone Nigam Ltd.	133.9173	125.3747	6.813704
Patni Computer Systems	355.6695	328.5663	8.248927
Satyam Computers	420.073	353.624	18.79084
Sterlite Industries	642.782	648.4339	(0.87162)*
Tata Communications Ltd.	309.9907	320.5752	(3.30172)*
Tata Motors	590.1391	574.8266	2.663855
Wipro	807.9562	905.3072	(10.7534)*
Shinhan Financial	37296.94	37592.76	(0.78691)*
Webzen	16640.25	22860	(27.208)*
Hutchison Telecommunications International	9.396526	9.030469	4.053576
Braskem	21.10237	3896.548	(99.4584)*
BRF - Brasil Foods	40.69412	27.04133	50.48858
Petroleo Brasileiro	62.57637	44.59056	40.33549
Gafisa	24.85606	24.92912	(0.29307)*
Tenaris	61.36116	63.38685	(3.19577)*
America Movil - Series A	24.39652	24.53204	(0.55242)*

COMPANIES	INTER-NATIONAL AVERAGE PRICES	DOMESTIC AVERAGE PRICE	AVERAGE PREMIUM (%)
America Movil - Series L	24.44845	24.76833	(1.29151)*
Fomento Economico Mexicano	62.72573	30.97592	102.4984

*Figures shown in () are negative premiums

From the above table IV, it can be noticed that the majority of companies have negative premiums (discounts). Four companies had showed less than zero discounts. Braskem had shown an abnormal discount with 99.4584% while Fomento Economico Mexicano showed abnormal premium of 102.4984% in comparison to others. There are several reasons behind this discrepancy and the major one is the Government regulations. These regulatory reasons may create a disparity between ADR and domestic share prices, such as restrictions on capital movements and tax differentials, investor restrictions, foreign ownership limits, differences in property right protection, overall market development, etc. Although government is trying to remove these barriers but markets are still not fully integrated and it is expected that the law of one price cannot be applied in some cases. Similar results were found in the research of Jithendranathan et al. (2000) where they study Indian ADRs and found that capital flows barriers allow domestic investors to invest only in domestic securities and, therefore expect higher returns than international investors. This type of restriction generated a premium for the ADR in context of underlying domestic stock.

Findings and Conclusion

The empirical findings showed a significant and very sharp increase in the market value around international listing. The overall sample evidenced that there was a run-up in the prices of the underlying domestic shares during the pre-listing period and decline in prices of the underlying domestic shares during the post-listing period. The cumulative average abnormal return over 100 days around the event was negative but it was positive for first 2 days from the event which showed positive market reaction to the expected event just after the event. Since the returns were negative for such a long period so it can be derived that at aggregate level the study provided mixed results which were consistent with the prior researches and there was no value enhancement due to international listing. But the study justified the theoretical background that an event had a positive impact on the returns of the stocks.

The overall results of the study showed (a) significant average abnormal returns of 0.944 percent on event day (b) significant average abnormal returns of 2.373 percent on 20th day before international listing; (c) insignificant positive abnormal of 0.1171914 and 0.410123 on the 1st and 2nd day from the international listing; and (d) significant average abnormal returns of 1.119 percent on 15th day during the post-listing period. The magnitude of increases in AARs during the pre-listing period was quite low compared to their subsequent declines in AARs on the listing day and during the post-listing period. The cumulative abnormal returns turned out to be negative for the whole data. Thus the overall sample seems to be adversely affected by the international listing during the post-listing period. But ADR listings in the sample studied did had significant impact on the prices of the underlying domestic shares on the listing day. Thus the results were interpreted as additional support to the previous research stating that international listing has either neutral or negative impact on shareholder value but this indication is very weak due to many statistically insignificant but overwhelmingly negative t-values. The results of the study contradict the previous studies of Korczak and Bohl (2003) and Errunza and Miller (2000). They showed that companies from emerging markets experience a permanent value enhancement and increasing returns around DR offerings.

The study further compared the long-term performance of domestic and international market returns of the underlying shares and found insignificant difference between the two markets, this means that both the market were providing similar returns to the investors.

The study of stock price behaviour revealed that the market segmentation hypothesis holds good in all the stocks of all the six countries (India, Korea, Hong Kong, Brazil, Argentina and Mexico) and it occurs due to the differences in the prices of ADRs and underlying domestic shares. With the ten ADRs trading at premium levels, foreign investors holding ADRs do not have any incentive to cancel them and convert them into domestic equities, implying the absence of arbitrage opportunities for the stocks. The resulting absence of arbitrage opportunity explains the persistence of premia levels in the ADR

prices over the underlying domestic share prices. The results of the study was similar to the study of Domowitz et al. (1998) where he examined the Mexican ADRs and concluded that unrestricted shares have substantial premium over restricted shares.

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