

Foreign Exchange Exposure of the Indian Pharmaceutical Industry

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ABSTRACT

Foreign exchange exposure has been one of the core issues of international financial management for many years. However, there still exists a considerable amount of confusion and ambiguity regarding the measurement of foreign exchange exposure. Of the many studies that have been carried out to propose a method to measure foreign exchange exposure, one that has been mostly often quoted and used is the measure proposed by Michael Adler and Bernard Dumas. Based on their seminal and by resorting to the Capital Asset Pricing Model (CAPM), the current study is an honest attempt to measure the foreign exchange exposure of firms from the Indian pharmaceutical industry.

Keywords: Exchange Rate Exposure, Pharmaceutical Companies, JEL classification: F31, F18

1. INTRODUCTION

Foreign exchange exposure is the sensitivity of changes in the real domestic currency value of assets, liabilities, or operating incomes to unanticipated changes in exchange rates (Adler & Dumas, 1984). With the introduction of the floating exchange rate regime corporates all around the world more cautious about changes in foreign exchange (forex) rates as these changes would expose their costs and revenues and consequently their market value to substantial fluctuations. Any company that engages in cross border transactions of any form, ranging from exports and imports of goods and services to foreign lending and borrowing and even to foreign investments (both portfolio and direct) would directly be exposed to fluctuations in forex rates. Moreover, any change in foreign exchange rates may affect the cash flows as well as the firm valuation.

Due to their increasing global presence, the Indian MNCs predominantly the Indian pharmaceutical MNCs are constantly exposed to the risk of fluctuating exchange rates. The pharmaceutical industry is one of India's top science based industries with wide ranging capabilities in the field of drug manufacture and technology. The Indian pharmaceutical industry occupies an important position in the global pharmaceutical sector. Indian drugs are exported to more than 200 countries and United States is the major export destination. Generic drugs account for 20 per cent of global exports in terms of volume, making India the largest provider of generic medicines globally and its share is expected to expand even further in coming years. According to the IBEF Report 2019, the export value of the Indian pharmaceutical sector stood at US\$ 17.27 billion in FY18 and has reached US\$ 19.14 billion in FY19. Pharmaceutical exports from Indian include bulk drugs, intermediates, drug formulations, biologicals, Ayush & herbal products and surgicals. Since the Indian pharmaceutical companies export to large number of companies, they are exposed to forex exposure.

According to the Press Release by the Ministry of Commerce and Industry, Government of India, the value of total exports from the country stood at USD 26.38 billion as on October 2019. The pharmaceutical exports showed a positive growth of 12.61% compared to October 2018. The ever increasing exports will expose the industry to even the slightest change in the foreign exchange rates. This paper therefore, attempts to examine the significance of the foreign exchange exposure in Indian pharmaceutical companies.

The paper is organized in six sequential sections. The first section deals with the introductory part that gives theoretical explanation on the foreign exchange exposure. The second section deals with the review of literature. In the third section, the paper elaborates the objective and justification of the research problem. The paper continues with the fourth section that provides data required and sources of the same. In the fifth section the model used in the study is explained in detail. Detailed analysis and interpretation of results are depicted in the sixth section which is followed by the concluding remarks in section seven.

2. LITERATURE REVIEW

The studies that investigate the exchange rate exposure have followed variants of model suggested by Adler and Dumas (1984). The current study also follows the model proposed by Adler and Dumas (1984). Following studies were reviewed specifically to have an insight on the model:-

Adler and Dumas (1984) suggested the estimation of exposure as the beta coefficient of exchange rate when regressed on the stock price of the company. Bartov and Bodnar (1994) and Pritamani et al. (2003) applied regression model with stock return and dollar exchange rate. Bartov and Bodnar did not find a relation between the two variables where as Pritamani et al. found that the stock returns are positively correlated with exchange rate. Khoo (1994) examined the foreign exchange rate exposure of mining companies in Australia and found that the exposure of the stock returns is very weak. Allayannis and Ofek (1997) studied exchange rate exposure, hedging, and the use of foreign currency derivatives of non-financial firms. The study used the model that included market return along with the exchange rate as independent variable and the stock returns being dependent variable.

Yuzel and Kurt (2003) examined the foreign exchange exposure of Turkish companies using the CAPM model with exchange rate as suggested by Adler and Dumas (1984) and also using the model that included market return. The study found that 11.8 % of sample firms have a positive and significant economic exposure. Dominguez & Tesar (2005) followed the Capital Asset Pricing Model (CAPM) to estimate the exchange rate exposure and established a significant relationship between stock returns and exchange rate. Pan and Liu (2012) had investigated on the exchange exposure considering industry specific stock returns and industry specific exchange rate, taking a sample of 20 US manufacturing industries employing the CAPM Model. But the study did not establish a significant relationship between the variables in all the industries. Erol et al. (2013) used the two-factor CAPM model to get the exchange rate exposure which revealed that selected firms had a positive but lagged exposure to real exchange rate changes.

A close look at the extant literature shows contradicting results on the relationship between exchange rates and stock returns. One among the reasons for such divergent results might be because most of studies considered industry as a base unit of study. Exchange rates will affect different firms differently and it is not wise to assume that the effect of a variation in exchange rate will have the same impact on all firms within an industry. Firms vary in terms of operating profiles,

financial strategies and other firm-specific variables (Choi and Prasad, 1995). Further, there is also a need to differentiate between export-oriented and import-oriented industries since appreciations and depreciations of the home currency will have different impacts on the stock returns. Therefore, to arrive at more meaningful conclusions, the unit of analysis should ideally be firms and if industries are taken as base of study, then care should be taken to differentiate them on the basis of their orientations. Most of the existing literature was conducting on the industries or firms from the developed markets. The international trade scenario in developing economies is changing rapidly because of the incessant desire of these markets to exploit opportunities in markets across their borders on one hand. The availability of cheap labour and the sheer size of the markets of these economies on the other hand pull MNCs from the developed economies into these markets.

3. OBJECTIVE

The study examines whether the firm value of Indian pharmaceutical companies significantly influence by the foreign exchange exposure.

The value of the firm is well reflected on the stock price of the companies. Therefore the study tries to establish a relationship between the stock price of the pharmaceutical companies and exchange rate exposure. The exporting companies are supposed to be benefitted with a fall in currency, that is a positive relationship between stock return and exchange rate is expected. The Indian pharmaceutical industry, being export-oriented, is expected to depict a significant positive relationship between stock returns and exchange rate exposure. In other words, they are likely to benefit from any depreciation in the local currency.

This study will also give an insight on how the pharmaceutical stock returns respond to the movement in the exchange rate.

DATA

The study selected thirty six pharmaceutical companies included in the Bombay Stock Exchange (BSE) Healthcare Index on the basis of availability of data. Monthly index values of BSE Healthcare Index, BSE Stock Prices of selected thirty six pharmaceutical companies from April 2010 to March 2017 were obtained from official website of BSE and real effective exchange rate (REER) index values of the same period were taken from the Database of Indian Economy maintained by the Reserve Bank of India (RBI).

MODEL

Adler and Dumas (1984) suggested the estimation of forex exposure as the beta coefficient of exchange rate when regressed on the stock price of the company. Later, the model was modified by introducing the effect of the return on market portfolio to capture the macroeconomic influences. The current study uses this capital market approach to find the forex exposure from 2014 to 2017. The exposure is measured as the sensitivity of stock returns towards the variation in the exchange rate by resorting to the CAPM approach.

In the present study on pharmaceutical industry, the BSE Healthcare Index values are taken as a proxy for the market portfolio and for the trade weighted exchange rate, the study considers the

REER Index calculated by the RBI on the trade base weight of 36 currencies. REER, constructed using inflation differential based on the CPI of India and trade partner countries, is seen as an indicator of international competitiveness (RBI, 2014).

EMPIRICAL ANALYSIS AND RESULTS

The exchange rate exposure is estimated using the following regression equation:-

$$R_{it} = \alpha + \beta_{im}R_{mt} + \beta_{ix}R_{xt} + \varepsilon_{it} \quad t = 1 \text{ to } T \quad (1)$$

R_{it} is the stock return of the i^{th} company in period t , i being 1 to 36 companies. R_{mt} is the return on the market portfolio, R_{xt} is the return on trade weighted exchange rate and ε_{it} is the error term. β_{im} is the measure of market risk and β_{ix} is the measure of the exchange exposure, which is the gauge of sensitivity of stock returns to changes in exchange rates incorporating the effect of market risk.

Exposure beta values (β_{ix}) are estimated for four years (ending March) 2014, 2015, 2016 and 2017 using the equation (1). For estimating a particular year beta value, five years' data preceding the targeted year is considered. The regression model is run with the log values of the variables. Table 1 gives the summary of the exposure beta coefficients of the thirty six companies during 2017-18 and 2016-17.

SUMMARY OF THE EXPOSURE BETA COEFFICIENTS OF THE THIRTY SIX COMPANIES DURING 2017 AND 2016

SL. NO	NAME OF THE COMPANY	2017			2016		
1	Abbott India Ltd.	4.128			3.906		
2	Caplin Point Laboratories			2.472	4.08		
3	Cipla Pharma			0.291			0.392
4	Dr. Reddy's Laboratories		-2.17			-0.66	
5	Gufic Biosciences Ltd.	13.97			7.164		
6	Hikal Ltd.		-5.61			-6.42	
7	Kopran Ltd.	3.29			5.428		
8	IOLChemicals& Pharmaceuticals	9.181			7.332		
9	Neuland			2.541			0.096
10	Poly			-0.2	0.127		
11	RPG Life Sciences	12.61			5.418		
12	Aarti			0.673			1.445
13	Alembic Pharma	2.691			4.58		
14	Astra			2.398	1.981		
15	Granules India Ltd.		-8.2			-5.42	
16	Hester Biosciences Ltd.	9.002			6.609		
17	Lincoln Pharmaceuticals	10.09			5.397		
18	Mangalam Drugs & Organics Ltd.	20.22			16.03		
19	Marksans Pharma		-7.46				1.202
20	Medicamen Biotech Ltd.	23.41			8.815		
21	Morepen Laboratories Ltd.	8.697			8.24		
22	Nectar Lifesciences Ltd.	3.585			5.42		
23	Panacea			1.034	3.655		
24	SMS Pharmaceuticals Ltd.		-8.3		2.433		
25	Vimta Labs Ltd.		-2.15		0.287		
26	Vivimed			-2.23	3.992		
27	Shilpa Medicare Ltd.	2.78			3.337		
28	Unichem Laboratories	1.821			0.409		
29	Sanofi India Ltd.	1.7					0.561
30	Ajanta Pharma Ltd.		-1.52			-3.76	
31	Aurobindo Pharma		-3.38		1.881		
32	Biocon Ltd.	3.422					0.932
33	Bliss GVS Pharma Ltd.	5.406			2.549		
34	Cadila Healthcare Ltd.		-7.75		0.351		
35	Lupin Ltd.		-1.13			-0.38	
36	Sun Pharma Industries Ltd.	1.547			1.67		
	TOTAL	18	10	8	25	5	6

* Significant at 5% level of significance

TABLE NO 1

Table 1 indicates that in 2017, 77 percent of the companies had significant beta coefficients and 22 percent companies had insignificant coefficients. As against this, 83 percent of the companies exhibited significant beta coefficients in the 2016 and the percentage of companies that had insignificant beta coefficients was only 16.

Table 2 gives the summary of the exposure beta coefficients during 2015 and 2014

EXPOSURE BETA COEFFICIENTS DURING 2015 AND 2014

SL. NO	NAME OF THE COMPANY	2015			2014		
		POSITIVELY SIG BETA	NEGATIVELY SIG BETA	INSIGNIFICANT BETA	POSITIVELY SIG BETA	NEGATIVELY SIG BETA	INSIGNIFICANT BETA
1	Abbott India Ltd.	1.972			2.322		
2	Caplin Point Laboratories			1.116		-2.93	
3	Cipla Pharma	0.874					-0.01
4	Dr. Reddy's Laboratories		-0.44		0.805		
5	Gufic Biosciences Ltd.	4.282			1.186		
6	Hikal Ltd.			-1.07			0.181
7	Kopran Ltd.	7.908			5.803		
8	IOLChemicals& Pharmaceuticals	7.506			1.847		
9	Neuland			1.278		-2.93	
10	Poly	1.614			2.192		
11	RPG Life Sciences	3.879			4.535		
12	Aarti	4.334			1.17		
13	Alembic Pharma	10.16			4.849		
14	Astra			-0.27	2.628		
15	Granules India Ltd.			1.061		-1.39	
16	Hester Biosciences Ltd.	5.651			2.225		
17	Lincoln Pharmaceuticals	4.484			2.058		
18	Mangalam Drugs & Organics Ltd.	10.15			6.318		
19	Marksans Pharma	5.382				-5	
20	Medicamen Biotech Ltd.	7.253			6.856		
21	Morepen Laboratories Ltd.	8.148			1.941		
22	Nectar Life sciences Ltd.	6.086			4.031		
23	Panacea	6.522			4.589		
24	SMS Pharmaceuticals Ltd.	3.552			1.353		
25	Vimta Labs Ltd.	3.998				-0.4	
26	Vivimed	2.481			5.204		
27	Shilpa Medicare Ltd.	4.673			4.641		
28	Unichem Laboratories	3.171			2.087		
29	Sanofi India Ltd.			-0.44	0.612		
30	Ajanta Pharma Ltd.		-3.83			-2.04	
31	Aurobindo Pharma	12.32			4.118		
32	Biocon Ltd.	2.115			2.216		
33	Bliss GVS Pharma Ltd.	2.464			0.759		
34	Cadila Healthcare Ltd.	2.352			2.309		
35	Lupin Ltd.	0.831				-2.57	
36	Sun Pharma Industries Ltd.	1.655					-0.72
TOTAL		28	2	6	26	7	3

* Significant at 5% level of significance

TABLE NO 2

Table 2 indicates that in 2015, 83 percent of the companies had significant beta coefficients 17 percent companies had insignificant beta coefficients. 92 percent companies had significant beta coefficients in 2014 and 8 percent companies exhibited insignificant beta coefficients.

Table 3 gives the cross sectional distribution of foreign exchange exposure beta of Indian pharmaceutical companies.

CROSS SECTIONAL DISTRIBUTION OF EXPOSURE BETA OF INDIAN PHARMACEUTICAL COMPANIES.

Year	Total no: of Significant β_{ix}^*	Positively Significant β_{ix}^*	Negatively Significant β_{ix}^*
2017	28	18	10
2016	30	25	5
2015	30	28	2
2014	33	26	7

* Significant at 5% level of significance

TABLE NO 3

Depreciation in home currency value is said to make exporting goods cheaper in foreign countries and a consequent increase in foreign demand will have a positive effect on the cash flows of the companies, which is then positively reflected on the stock price. A negatively significant β_{ix} (beta coefficient) means that depreciation in the home currency will result in a decrease in the stock returns of the companies. An insignificant β_{ix} means that a change in exchange rate will have no influence on the stock returns or cash flows of the firm. Table 3 clearly shows that there has been a fall in the number of companies that had positively significant β_{ix} . Further in 2017, only 50 percent companies had positive β_{ix} . However, 27 percent companies showed negative β_{ix} . But on an

Average 84 % of beta values are found to be significant 5 % level of significance indicating existence of a relationship between stock price and fluctuations in exchange rates. Also 67% of the beta coefficients are significantly positive and hence in general the Indian pharmaceutical companies benefit from currency depreciation and vice versa.

The insignificant beta coefficients (explaining insignificant relationship between stock price and exposure) are found to be increasing from the year 2014 to 2017. An obvious reason behind this increase could be the companies being more vigilant and aware about various hedging opportunities that are available to them to manage foreign exchange exposure. Further, a very few number of negative beta coefficients were found. An importing company is said to have negative beta as it is benefitted from a rise in exchange rate. But in the sample data the companies having negative beta are having more exports than imports.

4. CONCLUDING REMARKS

The study examined whether the firm values of Indian pharmaceutical companies are significantly influenced by the foreign exchange exposure. The Capital Asset Pricing Model was used to estimate the exchange rate exposure of pharmaceutical companies.

It was found that the number of companies having significant relationship shows a downward trend. This could be attributed to efficient management strategies used by the companies to manage their foreign exchange exposure over the years. The study found that a few pharmaceutical companies showed significant negative relationship. The importing companies are generally said to benefit from a rise in exchange rate and a negative relationship is expected to be found. But a closer analysis of the export and import data of these companies revealed that they had more exports than imports. Although an explanation into the reason behind this contradiction is beyond the scope of the study, this fact calls for further research. The study established a positive significant relationship between the firm value and exposure for the majority of the pharmaceutical companies during the selected period of study. An exporting industry is expected to benefit from a fall (depreciation) in exchange rate and the findings of this study conform to the existing theoretical framework.

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