Risk Management in FX Transactions

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Abstract

Risk Management in FX Transactions at Sify Technologies Limited, Chennai focuses on the risk involved in FX transactions that occur during export of services to United States of America (USA) and United Kingdom (UK). The research aims to identify the FX rates of USD and GBP in terms of INR, comprehend day-wise export revenue from sale of services to USA, UK and evaluate the risks arising out of fluctuation in FX rates. Statistical tools viz. Regression Analysis, Standard Deviation and Variance Analysis were used to analyze the financial data collected from annual reports of the company and FX prices during the study period. The research revealed that risk on trading with GBP is much higher than trading with USD. Sify Technologies Limited may precisely forecast foreign currency prices in terms of INR using regression analysis in order to reduce the risk in export transactions.

KEYWORDS: Risk, Exports, FX, Forecast and INR.

1. INTRODUCTION

FX risk (also known as exchange rate risk or currency risk) is a financial risk that exists when a financial transaction is denominated in a currency other than that of the base currency of the country. The risk is that there may be an adverse movement in the exchange rate of the denomination currency in relation to the base currency before the date when the transaction is completed. Investors and businesses exporting or importing goods and services or making foreign investments have an exchange rate risk which can have severe financial consequences; but steps can be taken to manage (i.e., reduce) the risk. “When an Indian company sells to a foreign buyer and accepts the buyer’s currency for payment, the Indian company bears the risk that the foreign currency depreciates and that it will receive fewer rupees once the foreign currency is converted back into rupees.”

1.1 RESEARCH REVIEW

Marshall (2000) compared risk management practices among UK, USA and Asia Pacific multinational corporations. He found that companies in Asia Pacific adopt significantly different approaches to their FX exposure management than UK and US companies. He also found that for the management of operating exposure, pricing strategy was the most popular. The research conducted by Marshall was oriented on the identification of regional differences for the management of transaction and translation exposures, thus a limited amount of attention was paid to the strategies the companies used for the management of operating exposure. **Driouchi et al. (2006)** explored the relationship

between the general performance of companies and their operational capabilities from the perspective of real options. Though this study does not directly investigate FX risk management practice or exchange rate exposure of companies, it provided additional evidence that the companies that possess various real options operational capabilities incorporated in their international and operational flexibility can in general reduce risk and benefit from advantageous opportunities. **Faseruk and Mushara (2008)** in their empirical study focused on exchange risk management, the authors pointed on the value enhancing power of the combination of financial and operational FX risk management activities. According to their results, in those cases when companies jointly involve financial and operational hedges the market-to-book value of companies was increased by 14% and market value-to-sales by 40%. The research however, was only addressed to the risk management practice of large Canadian non-financial companies and risk management activities were proxy by variables taken from the financial statements of the companies.

2. METHODOLOGY

2.1 STATEMENT OF THE PROBLEM

Descriptive research on risk management in FX transactions was conducted at Sify Technologies Limited, Chennai to identify the risk element that arises in FX transactions of the company and examine the ways to overcome the risks involved.

2.2 OBJECTIVES OF THE STUDY

- To examine the risk involved in FX transactions at Sify Technologies Limited.
- To forecast the FX rates of USD and GBP in terms of INR using foreign currency prices for a period of 365 days during FY 2012 – 2013
- To anticipate day-wise export revenue from sale of services to USA and UK.
- To evaluate the risk arising out of fluctuations in FX rates.
- To suggest measures for the company to mitigate FX risk.

2.3 DATA SOURCE: Secondary data has been collected from websites, magazines, journals, company annual reports, transaction reports and industrial magazines.

2.4 LIMITATIONS OF THE STUDY

The published reports were not always the correct indicators of the firm's performance. To have a better analysis, it is advisable to base the study on the monthly or quarterly revenue data of the organization. Research will suffer from the limitations of statistical tools used. Annual report of FY 2013 – 2014 were not publicly available during the study period in order to compare forecast revenues with actual revenues.

3. ANALYSIS AND DISCUSSION

3.1 FORECASTING USD – INR PARITY USING REGRESSION ANALYSIS

The closing prices of USD – INR parity during 365 days starting from April 01, 2012 to March 31, 2013 were regressed to compute:

Median = 183; n = 365; Average of 'X' Series = 0; Average of 'Y' Series = 54.31422

Equation: Y = a + bX

$$b = \frac{\sum XY - XY}{\sum X^2 - \frac{(\sum X)^2}{n}}$$

$$b = \frac{-398.6642 - (0 \times 54.31422)}{4052230 - (0)/365} = -9.83814$$

$$a = \bar{X} - b\bar{Y}$$

$$a = 54.31422 - (-9.83814 \times 0) = 54.31422$$

Y_{366}= 54.31422 + (-9.83814) (366-183) = Rs. 54.2962
Y_{367} = 54.31422 + (-9.83814) (367-183) = Rs. 54.29611946
Y_{368} = 54.31422 + (-9.83814) (368-183) = Rs. 54.29602108
Y_{369} = 54.31422 + (-9.83814) (369-183) = Rs. 54.2959227
Y_{370} = 54.31422 + (-9.83814) (370-183) = Rs. 54.29582432
Y_{371} = 54.31422 + (-9.83814) (371-183) = Rs.54.29572593
Y_{372} = 54.31422 + (-9.83814) (372-183) = Rs.54.29562755

Discussion:
The forecast USD price in terms of INR between April 01, 2013 and April 07, 2013 ranges from Rs. 54.2956 to Rs. 54.2962 per USD.

3.1.1 REVENUE FORECAST (USD)

Year (x)	Export Revenue (Y)	X = x – Median (x-2011)	X^2	XY
2010	3226964	-1	1	-3226964
2011	50620304	0	0	0
2012	55337243	1	1	55337243
	$\sum Y$= 109184511	**$\sum X$=0**	**$\sum X^2$ = 2**	**$\sum XY$ = 52110279**

*Note: - Median = 2011, n = 3; Average of 'X' Series = 0; Average of 'Y' Series = 36394837

Equation: Y = a + bX

$$b = \frac{\sum XY - \bar{X}\bar{Y}}{\sum X^2 - \frac{(\sum X)^2}{n}}$$

$$b = \frac{52110279 - (0 \times 36394837)}{2 - (0)/3} = 26055139.5$$

$$a = \bar{Y} - b\bar{X}$$

$$a = 36394837 - (26055139.5 \times 0) = 36394837$$

Y_{2013}= 36394837 + (26055139.5) (2013-2011) = 88505116

Average = $\frac{Y2013}{365}$ = 242479.77

Date	Average Forecast Revenue	USD – INR Parity Forecast	Forecast Revenue
April 01, 2013	242479.77	54.29620	13165730.09
April 02, 2013	242479.77	54.29612	13165710.69
April 03, 2013	242479.77	54.29602	13165686.44
April 04, 2013	242479.77	54.29592	13165662.19
April 05, 2013	242479.77	54.29580	13165633.10
April 06, 2013	242479.77	54.29570	13165608.85
April 07, 2013	242479.77	54.29560	13165584.60

Discussion: The weekly forecast of revenue during first week of April 2013 in terms of INR ranges from 1,31,65,584.6 to 1,31,65,730.09.

3.2 FORECASTING GBP-INR PARITY

The closing prices of GBP – INR parity during 365 days starting from April 01, 2012 to March 31, 2013 were regressed to compute:

Median = 183; n = 365; Average of 'X' Series = 0; Average of 'Y' Series = 85.83303

Equation: Y = a+bX

$$b = \frac{\sum XY - XY}{\sum X^2 - \frac{(\sum X)^2}{n}}$$

$$b = \frac{-16997.40 - (0 \times 85.83303)}{4052230 - (0)/365} = -0.00419457$$

a = Average of Y Series – b (Average of 'X' Series)

$$= 85.83303 - (-0.00419457 \times 0) = 85.83303$$

Y_{366}= 85.83303 + (-0.00419457) (366-183) = Rs. 85.06542752

Y_{367} = 85.83303 + (-0.00419457) (367-183) = Rs. 85.06123294

Y_{368} = 85.83303 + (-0.00419457) (368-183) = Rs. 85.05703836

Y_{369} = 85.83303 + (-0.00419457) (369-183) = Rs. 85.05284379

Y_{370} = 85.83303 + (-0.00419457) (370-183) = Rs. 85.04864921

Y_{371} = 85.83303 + (-0.00419457) (371-183) = Rs.85.04445463

Y_{372} = 85.83303 + (-0.00419457) (372-183) = Rs.85.04026006

Discussion:

The forecast GBP price in terms of INR between April 01, 2013 and April 07, 2013 ranges from Rs.85.0402 to Rs. 85.0654 per GBP.

3.2.1 REVENUE FORECAST (GBP)

Year (x)	Export Revenue (Y)	X = x – Median (x-2011)	X^2	XY
2010	6950	-1	1	-6950
2011	371739	0	0	0
2012	592197	1	1	592197
	$\sum Y$= 970886	$\sum X$=0	$\sum X^2$ = 2	$\sum XY$ = 585247

*Note: - Median = 2011; n = 3; Average of 'X' Series = 0; Average of 'Y' Series = 323628.7

Equation: $Y = a + bX$

$$b = \frac{\sum XY - XY}{\sum X^2 - \frac{(\sum X)^2}{n}}$$

$$b = \frac{585247 - (0 \times 323628.7)}{2 - (0)/3} = 585247$$

$$a = \bar{Y} - b\bar{X}$$

$$a = 323628.7 - (585247 \times 0) = 323628.7$$

Y_{2013}= 323628.7 + (585247) (2013-2011) =1494122.7

Average = $\frac{Y2013}{365}$ = 4093.487

Date	Average Forecast Revenue	GBP – INR Parity Forecast	Forecast Revenue
April 01, 2013	4093.487	85.0650	348212.472
April 02, 2013	4093.487	85.0610	348196.098
April 03, 2013	4093.487	85.0510	348155.163
April 04, 2013	4093.487	85.0528	348162.531
April 05, 2013	4093.487	85.0486	348145.338
April 06, 2013	4093.487	85.0445	348128.555
April 07, 2013	4093.487	85.0402	348110.953

Discussion: The weekly forecast of revenue during first week of April 2013 in terms of INR ranges from 3,48,110.953 to 3,48,212.472.

3.3 VARIANCE ANALYSIS

3.3.1 VARIANCE BETWEEN FORECAST AND ACTUAL PRICE OF USD

Date	Forecast	Actual	Variance = Forecast – Actual price	% of Variance
April 01, 2013	54.29621784	54.3550	0.058782	0.108262
April 02, 2013	54.29611946	54.4318	0.135681	0.249890
April 03, 2013	54.29602108	54.3201	0.024079	0.044347
April 04, 2013	54.29592270	54.3874	0.091477	0.168479
April 05, 2013	54.29582432	54.6846	0.388776	0.716032
April 06, 2013	54.29572593	54.7406	0.444874	0.819354
April 07, 2013	54.29562755	54.5670	0.271372	0.499805

Discussion: When the regressed price of USD in terms of INR during April 01, 2013 to April 07, 2013 is compared with actual price, a variance of 5 paisa to 44 paisa (approx.) is discovered per USD as a result of actual price being greater than forecast price.

3.3.2 VARIANCE BETWEEN FORECAST AND ACTUAL PRICE OF GBP

Date	Forecast	Actual	Variance = Forecast – Actual price	% of Variance
April 01, 2013	85.06542752	82.5614	-2.50403	-2.94
April 02, 2013	85.06123294	82.7609	-2.30033	-2.70
April 03, 2013	85.05703836	82.4791	-2.57794	-3.03
April 04, 2013	85.05284379	82.1984	-2.85444	-3.36
April 05, 2013	85.04864921	82.7787	-2.26995	-2.67
April 06, 2013	85.04445463	83.5430	-1.50145	-1.77
April 07, 2013	85.04026006	83.6228	-1.41746	-1.67

Discussion: When the regressed price of GBP in terms of INR during April 01, 2013 to April 07, 2013 is compared with actual price, a variance of Rs. 1.42 to Rs. 2.85 (approx.) is discovered per GBP as a result of forecast price being greater than actual price.

3.4 ESTIMATION OF RISK

3.4.1 ESTIMATION OF RISK IN TRADING WITH USD USING SD

The risk in trading with USD using Standard Deviation (SD) reveals:

Standard Deviation = $\sigma = \sqrt{\frac{\Sigma(X-\bar{X})^2}{n}} = \sqrt{\frac{-398.6642}{365}}$ 1.16023

=

Discussion: The risk on trading with USD in terms of INR during April 01, 2012 to March 31, 2013 is calculated as σ =1.16023.

3.4.2 ESTIMATION OF RISK IN TRADING WITH GBP USING SD

The risk in trading with GBP using Standard Deviation reveals:

Standard Deviation = $\sigma = \sqrt{\frac{\Sigma(X-\bar{X})^2}{n}} = \sqrt{\frac{1582.1701462}{365}}$ = 2.081997

Discussion: The risk on trading with GBP in terms of INR during April 01, 2012 to March 31, 2013 is calculated as $\sigma = 2.081997$.

3.5 COMPUTATION OF RISK INVOLVED IN REVENUE EARNED FROM EXPORTING OF SERVICES

Currency	Revenue	σ	Risk Administered Revenue	RISK*	RISK in INR
GBP	592197	2.082	1232954	640757	54996115
USD	55337243	1.160	64191202	8853959	480895877
TOTAL	55929440		65424156	9494716	535891992

**(Risk = Risk Administered Revenue – Revenue)*

Decrease in Gains from foreign transaction

Export gains for the year ended March 31, 2012 – Export gains for the year ended March 31, 2013

= 109 – 68 = 41 crores.

Risk Suffered:

$$= \frac{Decrease\ in\ gains\ from\ foreign\ transaction}{x} x\ 100$$

= 41/53.59 * 100 (Where x implies total risk in terms of INR)

= 76.51%

Risk Mitigated = $100 - Risk\ Suffered$

= 100 – 76.51%

Risk Mitigated = 23.49%

Discussion: The Company is able to mitigate its risk by 23.49 %.

4. OUTCOMES

4.1 RESULTS: USD – INR parity forecasts using regression analysis was precisely estimated between 99.18% and 99.96%. GBP – INR parity forecasts using regression analysis was precisely estimated between 96.64% and 98.33%. The USD revenue is expected to be 1.43 times greater than average revenue in past three years and GBP revenue is anticipated to be 3.62 times larger than average revenue of past three years. The risk on trading in GBP is much higher (nearly double) than trading with USD. The company is able to mitigate its risk by 23.49%.

4.2 SUGGESTIONS: The currencies recommended to trade are USD and GBP respectively according to risk involved in trading with these currencies. Sify Technologies Limited may forecast foreign currency prices using regression analysis by considering the data for a continuous period of 365 days in order to precisely estimate the foreign currency price in terms of INR. The accurate prediction of foreign currency prices shall reduce the amount of risk involved in trading with the foreign currencies. The foreign currency prices forecast may enable the company to opt for futures or forward contracts in that particular currency which would do better in terms of INR during the years ahead. The accurate estimates of foreign currency prices would also enable the company to go in for interest rate swaps.

4.3 CONCLUSION: The research on risk management in FX transactions at Sify Technologies Limited, Chennai focuses on the risk involved in FX transactions that occur

due to services exported by organization. The objectives of study were to identify FX rates of USD and GBP in terms of INR during the financial year 2012 – 2013, understand day-wise export revenue from sale of services to USA and UK during FY 2012-2013, and evaluate the risk arising out of fluctuation in FX rates. The secondary data collected were analysed using statistical tools viz. Regression analysis, Standard Deviation and Variance analysis. The results reveal that risk on trading with GBP is much higher (nearly double) than trading with USD. Thus, Sify Technologies may forecast foreign currency prices using regression analysis by considering the data for a continuous period of 365 days in order to precisely estimate the foreign currency prices in terms of INR which will reduce the risk faced by the company. The research may be further enriched by regressing the foreign currency prices for a period more than one year in order to compute more accurate forecasts.

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