Financial Sustainability Through Effective Risk Management Practices

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Abstract

The contribution of Indian small and medium export firms to the total gross domestic product and employment generation has been commendable. These firms were in the limelight recently because of their currency risk management practices. A few firms were able to manage risks effectively, whereas many firms suffered losses in spite of taking positions in derivatives. The bankers also allegedly mis-sold derivatives to these firms. Against this background, the present study was conducted with randomly selected 330 firms to examine the currency risk management practices of select export firms on three dimensions: exposure management, hedging decisions, and derivative decisions. Through this study, an evaluation was made of their knowledge levels, requirements, and usage of suitable hedging tools apart from analyzing their risk management policies and practices. As the firms varied in their practices, a classification of firms using K-means clustering, based on the strategies used by them, was attempted, resulting in three discriminated groups. A prediction of future group associations of firms with the given risk management outlook, using discriminant analysis, yielded results with 98% accuracy. Profiling the export firms based on their risk management practices could be used by financial institutions, legal advisors, auditors, and so forth to render advice effectively regarding financial products.

Keywords: SMEs, risk management, exposure management, risk analysis, hedging, derivatives

JEL Classification: G01, G110, G280, G320

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The business models of the SMEs are considered as the principal driving force for the economic development of any nation. In India, SMEs are considered as the key drivers of growth, as 40% of the Indian SMEs contribute to the total exports of the country. SMEs generate 47% of the employment too. Their export destinations are scattered geographically across the world. The challenges faced by the Indian exporting firms are - dealing with a volatile currency, and a competitive global market. In addition to these, the firms have to cope up with the shift from a restrictive environment to a regulatory environment. Apart from the above-mentioned factors, the Indian currency vis-à-vis the U.S. dollar also witnessed the highest level of volatility. Thus, it became imperative for the Indian SMEs to perceive currency risk seriously and devise suitable strategies for managing them effectively. However, the practices of Indian SMEs became questionable as only a few firms were able to withstand the challenges posed by a volatile exchange rate. The newspapers and magazines reported extensively on the losses faced by the firms. The firms differed both in terms of practices and performance. Firms with sound risk management practices showed high levels of performance (Hariharan, 2012).

Statement of the Problem

The available literature on currency risk management discusses the issues pertaining to multinational companies. The risk-management practices of SMEs are not redressed in particular. The risk-management practices of small and medium enterprises differ from the multinationals in many ways. The financial resources available to the

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MNCs help them to take up risk management seriously and they set up exclusive treasury departments to monitor currency risks. Most of the studies done in the past indicated the presence of exclusive treasury departments. In some cases, the treasury activities are carried out by the accounting and or finance departments. Thus, it is logical to presume that MNCs gain out of monitoring risks, and they are right in investing in the treasury department, although it does incur costs for the firms. However, it will be interesting to probe the strategies using which the SMEs manage their currency risks as the literature available is insufficient in this regard, and most of the firms operating in the export market are SMEs.

Literature Review

Corporate risk management was considered as an irrelevant factor that contributes to the value of a firm. The Modiglani- Miller theory proposed that managers are indifferent to hedging corporate exposures, as the investors would have already hedged the unsystematic risks on their side. Hence, they were advised to concentrate more on managing systematic risks. Unsystematic risks have their source in returns, and it is internal in nature for a manager. But systematic risks are market driven, and hence, are external in nature. However, a combination of greater deregulation, international competition, interest rates, and foreign exchange rate volatility, together with commodity price discontinuities starting in the late 1960s, heightened corporate concerns, which resulted in the increased importance of financial risk management in the decades that followed (Allen & Santomero, 1997).

   Currency risks or foreign exchange risks are understood as risks arising out of exchange rate fluctuations, and they influence the value of the firm directly and indirectly. Before the advent of the derivative regime, managing financial risks were considered outside the purview of the management, and the firms resorted to natural and operational hedges like price, shifting to other locations, and so forth (Santomero,1995). Emerging markets limit a firm's ability to adjust prices and shifting of locations is an expensive decision. So, companies have to look for other means of managing currency risks. The developments in the derivatives market has made the financial executives in firms around the world to rank risk management as one of their most important objectives (Bartram, 2000).

   Javaid (1985) found that the firms faced a new risk called foreign exchange risk when they expanded their businesses to other countries. Glaum (1990) emphasized on strategizing risk management practices. Batten, Mellor, and Wan (1993) (for Australian firms); Sprčić (2007) (for Croatia and Slovenia) ; Rao (2007) (for Dubai) ; and Bartram, Brown, and Minton (2009) suggested alternate methods of managing currency risk. Pichler and Loderer (2005) analyzed the risk management practices among Swiss firms. Research on small and medium enterprises has indicated that, in developed countries, entrepreneurial small firms play critical roles in introducing new products and new techniques into the market through technological innovations (Ács & Audretsch, 1990 ; Pavitt, Robson, & Townsend, 1987). Studies done to analyze the practices of SMEs indicated that extant literature on corporate social responsibility and ethics felt the need for a greater understanding about SMEs and their practices (Kaynak & Kothari, 1984).

   A survey of select Canadian oil and gas companies revealed that the firms used derivatives to hedge as well as speculate. It was found that the large firms were likely to use hedge accounting than the others. However, all firms, irrespective of size, were found to use commodity derivatives to hedge risk (Smistad & Pustylnick, 2012). Large corporations, from both the Western and Eastern worlds, have been using derivative instruments as a tool to protect their indirect exposure, such as foreign exchange risks. The study aimed at analyzing the behavior of the cost of capital of non-financial Brazilian companies when they used derivatives-based financial instruments to protect (or hedge) their cash flows. The data panel methodology (cross section with random effects) was used with the aim of testing the hypothesis that the use of derivatives as a risk-management policy tool reduces companies' cost of capital. In contrast to evidence found in other countries, the results rejected this hypothesis, showing that in Brazil, there is a positive relationship between the use of these tools and cost of capital. However, a more in-depth analysis based on the TACC (total average cost of capital) model for a Brazilian company revealed that this hypothesis was not rejected after the 2008 crisis (Coutinho Sr., Sheng, & Lora, 2011). Exchange rate systems and

their impact on the export competitiveness of an economy too have been studied in the past (Park & Song, 2011).

Objectives of the Study

This study was aimed to realize the following objectives :

- ✎ To examine the risk management practices of the export firms,
- ✎ To compare and classify the firms based on their risk management practices,
- ✎ To predict the future group association of the firms given the variable sets.

Methodology

The literature reviewed descriptive studies on risk-management practices of firms, however, only a few analytical studies have focused on the risk-management practices of firms. There were no tested questionnaires available. Hence, the opinion of the sample firms was collected through a structured questionnaire, prepared for the current study, that tested the firms' agreement to a set of statements. These statements measured the firms' agreement with risk management practices on a 5 - point scale. The study was carried out for a period of 5 years, from January 2008 to January 2013.

✎ **Sampling Design :** The respondents of the study consisted of exporters who were actively engaged in the export of goods and or services to other countries. In India, exporters register their firms with the Federation of Export Organizations (FIEO) set up by the Ministry of Commerce, Government of India. This is an optional registration, but most of the firms, especially those that deal with multiple products, register themselves with this organization in order to avail the benefits mentioned in the foreign trade policy.

✎ **Sample Statistics :** The population considered for this study consisted of firms that are registered with FIEO. From the population of over 15,000 units, a sample of 330 firms was selected at random. The sample size was arrived at by using the formula :

$$n = (ZS / E)^2$$

Where,
    S is the sample standard deviation,
    Z is the standardized value corresponding to a confidence level.

Using the pilot study score obtained from 30 respondents, the standard deviation arrived at was 55.65. The Z value was 1.96, and the acceptable error was fixed at 6%. The value of n was found to be 330.14. However, the questionnaire was mailed to about 2000 firms. About 500 firms responded to the questionnaire, from which 330 responses were selected at random. Some of the responses were incomplete, and had to be omitted from the survey. Only the responses that were complete in all respects were taken into consideration.

✎ **Variables Used in the Study :** The existing literature on the concepts fetched many variables that were and still are used to understand risk management practices. For the purpose of the current study, three main variables were considered for grouping the firms. The variables used are :

(1) Exposure management,
(2) Hedging decisions,
(3) Derivative decisions.

The three variables were measured in the following ways :

Table 1. Preliminary Tests

Parameters	Values
Cronbach's Alpha	0.74
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.785
Bartlett's Tests for Sphericity - Chi-Square	7135.048
Degrees of Freedom	300
p - value	0.00

(1) The first variable was tested with statements that tested the sample firms' agreement to the following processes :

? Identification and quantification of exposure,
? Monitoring exposures,
? Responsibility centres for monitoring, like the treasury department.

(2) For the second variable, the following currency risk management practices followed by the companies were measured :

? Existence of policy statements,
? Decisions on hedging - to hedge or leave the exposure open,
? Knowledge and awareness of alternate techniques of hedging.

(3) The third variable, derivative decisions, tested the following areas :

? Knowledge and awareness of derivatives,
? Analysis of various alternate forms of derivatives,
? Decisions on usage of derivatives.

A series of preliminary tests were conducted in order to test whether the data could be taken for further analysis. The data were subjected to tests for reliability and sampling adequacy. The reliability of the scale was measured using Cronbach's alpha. This data had a reliability score of 0.83. A reliability score of 0.7 is considered as acceptable (Hair Jr., Anderson, Tatham, & Black, 1998) . Similarly, a sampling adequacy ratio of 0.5 is considered adequate (Kaiser, 1970). The details pertaining to preliminary analysis are discussed in the Table 1. As the preliminary tests confirmed the fitness of data for advanced analyses, other tests were performed.

Analysis and Results

Using the technique of k- means cluster analysis, an attempt was made to classify the firms based on their risk-management practices. The samples were first subjected to hierarchical clustering to determine the number of clusters. Using the results obtained as the base, the number of clusters was fed in as the k-means clustering input and the results are presented in the Table 2. All the 330 firms were considered for the model. The variables were given a score under each cluster, which represents the average score given by the firms for the parameters considered under each variable. It was observed that the firms categorized under Cluster 3 ranked the variables the highest, indicating that these firms followed good risk management practices. The scores under Cluster 1 were the least, indicating that the firms followed low or no risk management practices. Firms under Cluster 2 had flexible risk management practices as they received medium scores. Studies conducted earlier have indicated that the firms with sound risk management practices showed higher levels of export performance in the Indian context (Hariharan, 2012).

Table 2. Classification of the Firms Based on Practices

Variables	Cluster 1	Cluster 2	Cluster 3	F	Mean square
Exposure management	37	60	69	3256.194	28300.187
Hedging decisions	50	71	88	4716.904	37195
Derivative decisions	2.61	3.15	3.68	547.973	28.890
Number of firms in each cluster	111	129	90		

By default, SPSS performed the ANOVA test as the first step in cluster analysis. The samples were subjected to an ANOVA test to compare the differences between the clusters and the differences within the clusters. The basic objective was to minimize the differences within the clusters and to maximize the differences between the clusters. A higher *F* value suggests maximum differences between the clusters. The ANOVA test was not conducted to test any hypothesis regarding the distances between the clusters, but the significance value adds strength to the clustering by showing that the firms are adequately grouped. The high *F* values for all three variables proved that the firms had been adequately classified.

✍ **Practices of Firms with a Proper Risk Management System (Cluster 3) :** Firms belonging to Cluster 3 were firms with a strong risk management system in place. They had a separate department to take care of monitoring the exchange rates and also to monitor the exposure levels. Some firms had an exclusive treasury department (centralized or decentralized) and in some firms, the finance and/or the accounting department took care of the job of the treasury department. They had well-defined hedging practices, even if it was to be buying a forward contract. Definite techniques of hedging, decisions as to leave it open or hedge it, and so forth were all communicated to the employees. Some firms even used various advanced techniques like the Monte Carlo simulation, and so forth, for risk assessment. Value at Risk is the most common method used for risk assessment. Hedging decisions were centralized in some firms and in the other firms, decisions were decentralized, but the system was well-defined. Derivative usage was also not uncommon in the case of certain firms. These firms had the highest average of the variables that were used to measure export performance like average annual turnover, average annual revenue, and export intensity.

✍ **Practices of Firms with a Flexible Risk Management System (Cluster 2) :** Cluster 2 consists of firms with a flexible risk management system. They did have a system in place, but took decisions on hedging based on the instructions from higher authorities. At times of crisis, the decision-making authorities also kept changing. The level of decision-making changed with the nature of the crisis and also based on the solemnity of the issue. The exposure levels also determined whether the risk had to be hedged or not. The policies of firms in this cluster did not mention the details of risk management practices followed by the firms. The averages of the export performance variables stood between the two other groups.

✍ **Practices of Firms Without a Risk Management System (Cluster 1) :** Cluster 1 consists of those firms that did not have a proper risk management policy in place. The exposure management and hedging activities were highly time-dependent. Most of the exposures were managed by taking a forward contract. The awareness levels of the firms with regards to the exotic derivatives were quite low. Their export intensity was also quite less. They took decisions on hedging by taking the advice of their bankers.

Thus, the second objective of classifying the firms based on risk management practices is accomplished. The next step is to make an attempt to predict future group associations of the firms. In order to predict the same, the variables that measured risk management practices had to be used, and the strength of these variables to predict group associations too had to be tested. In order to accomplish this objective, discriminant analysis was employed.

Table 3. Summary of Analysis

Cluster Number	Variables used for grouping	Mean	Standard Deviation	Number
1	Exposure Management	36.73	1.07	
	Hedging decision	49.86	2.62	111
	Derivative decision	2.60	0.23	
2	Exposure Management	59.93	3.42	
	Hedging decision	71.02	3.33	129
	Derivative decision	3.15	0.13	
3	Exposure Management	68.56	3.37	90
	Hedging decision	88.22	2.11	
	Derivative decision	3.68	0.32	
Total	Exposure Management	54.48	13.44	330
	Hedging decision	68.60	15.30	
	Derivative decision	3.11	0.48	

Table 4. Box's M Test Results

Box's M	429.347
F (Approx)	35.292
df1	12
df2	42
Sig.	.000

Table 5. Log Determinant Results

Cluster Number	Rank	Log Determinant
1	3	-2.132
2	3	-1.803
3	3	-.924
Pooled within groups	3	-.362

Table 6. Test for Equality of Covariance Matrices

Variables	Wilks Lambda	*p*- value
Exposure management	0.048	0.01
Hedging decisions	0.034	0.01
Derivative decisions	0.230	0.01

✎ **Discriminant Analysis :** The Table 3 presents the descriptive statistics of the 3 predictor variables, namely exposure management, hedging decisions, and derivative decisions. It was observed that the means of exposure management, hedging decisions, and derivative decisions differed noticeably among the sample firms. Thus, these predictor variables were used to distinguish firms in one cluster from firms in another cluster.

Box's M test was applied to prove that the clusters differed among each other (Table 4). It tests the null hypothesis that the covariance matrices do not differ between groups formed by the dependent variable. The

Table 7. Eigen Values

Function	Eigen Value	% of Variance	Cumulative %	Canonical Correlation
1	41.717	95.1	95.1	.988
2	2.162	4.9	100.0	.827

Table 8. Results of the Discriminant Analysis

Dimension	Canonical Correlation	Wilk's Lambda
1	0.988	0.007
2	0.827	0.316

Table 9. Function of the Variables

Cluster number of variables	Function	
	1	2
1	-8.410	.749
2	1.862	-1.777
3	7.705	1.624

statistics revealed that the significance value (0.00) is lower than the cut-off value of 0.05, so that the null hypothesis is rejected. As the covariance matrices differ between groups formed by the dependent variable, log determinants should be equal. The log determinant output is presented in the Table 5.The rank column presents the number of independent variables. This number also indicates that all the cases were analyzed using these independent variables. The log determinants are relatively equal, with the exception of the third cluster, in which the log determinants are slightly lower.

The Table 6 presents the results of the test conducted to prove that the groups had different covariance, and thus, do not conform to the assumptions of homogeneity of covariance. The significant value (p - value) is less than 0.05, and hence, the alternate hypothesis is accepted, which states that the datasets differed from each other. Eigen value gives the amount of variance in the original variables accounted for by each component. Higher Eigen values reflect greater strength of the relationships. Here, the values for both the equations are adequate; hence, the functions are considered strong, as presented in the Table 7.

Canonical correlation coefficient represents the correlation between the discriminant scores and the dependent variables and is given in the Table 8. The discriminant score is the weighted linear combination of the variables. It is considered better for the function if it is closer to 1. Here, both the values are closer to 1, again proving the relationship function to be strong. Wilk's Lambda presented in the Table 8 is the ratio of within groups sums of squares to the total sums of squares. It is the total variance in the discriminant scores not explained by differences among the groups. A lambda of 1.00 occurs when the observed group means are equal. A small lambda makes the group differ. The value of the first equation is very less as compared to the second. The variance contributed by the equation stands at 68.4% (100-31.6).

The Table 9 indicates the average discriminant score for subjects in the two groups. This is yet another way of interpreting the discriminant analysis. It is used to describe each group in terms of its profile, using the group means of the predictor variables. These group means are called centroids. In this case,

(1) Exposure Management = -8.410 and 0.749,

(2) Hedging Decisions = 1.862 and -1.777,

(3) Derivative Decisions = 7.705 and 1.624.

Table 10. Results of the Discriminate Scores

Grouping Variables	Dimensions	
	1	2
Exposure Management	0.619(0.827)*	-1.504(0.380)
Hedging Decisions	0.988(0.687)*	1.053(-0.320)
Derivative Decisions	-0.867(0.280)*	0.580(0.204)

*Significant correlation of the three variables accordingly.

Discriminant analysis presents the output after conducting the analysis in two dimensions. For both the dimensions, the correlation of the variables with the function is high. When the correlations between the observed variables and the dimensions created with the unobserved discriminant function were analyzed, it was found that all the correlations were significant at the 5% level of significance. The Table 10 shows significant correlations (flagged) for all the three variables, namely average, derivatives, and risk management practices for predicting group membership. Based on the discriminant scores, the functions were formed, which are as follows :

Function 1 = 0.619 Exposure + 0.988 Hedging - 0.867 Derivative
Function 2 = -1.504 Exposure + 1.053 Hedging + 0.58 Derivative

The analysis confirms that the model can be used to classify the firms based on risk management practices. The firms with a good risk management system were able to show a high performance and firms with no risk management system in place exhibited the least level of performance. Firms that had a flexible risk management system in placed performed slightly better than the low-performing firms.

Research Implications

The banks are accused of misselling derivatives to the SMEs. However, the actual cause of the extensive losses faced by the SMEs is due to their inability to forsee the challenges coming in their way due to a volatile currency. If the SMEs have proper risk management practices in place, then such crises can be averted. This study helps in classification of firms into three groups, firms with no risk management practices, firms with flexible risk management practices, and firms with proper risk management practices. Applying this model, firms can be categorized, and this information can be used by bankers or financial institutions to decide about their lending practices.

Conclusion

This study was conducted not only to examine the risk management practices, but also to classify the firms based on these practices. The varying risk management practices among firms necessitated this study. Through this study, all 330 samples were classified into three clusters. Earlier studies have shown that firms with good risk management practices have shown a good export performance. Thus, it is imperative for firms to have sound risk management practices so that they become sustainable in the future, or in other words, economic shocks like recession would not dampen future prospects of their business models. Banks can use this model to classify the firms based on their knowledge, practices adopted, and awareness for selling their financial products.

Decisions regarding risk management are highly time bound, and the employees often find themselves in problematic situations without policy documents. A strong system that communicates with all employees in this regard will also be highly beneficial as they need not wait for their superior's decisions. The treasury department is expected to monitor the exposure and aid the firms in minimizing the losses. It is not a profit center. The firms'

attitude towards treasury departments should be changed, and these departments should be considered an important arm of the organization's functioning.

Many firms do not perceive the subtle difference between hedging and speculation while investing in currency hedges. Again, derivatives too help in minimizing the losses and do not exist simply to increase the profits. Thus, a change in attitude of small businesses towards currency risk management practices would help them achieve sustainability in the long run.

Limitations of the Study and Scope for Further Research

This study is limited in terms of applicability across time. The factors involved in this study vary with time and the kind of management styles of the SMEs. Further research can be directed towards predicting future forex rates, forward rates, and assessing their impact on the firms using advanced econometric tools.

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