

Impact of Research and Development on the Profitability of Multinational Firms

OPEN ACCESS

Volume: 11

Special Issue: 2

Month: February

Year: 2024

E-ISSN: 2582-0397

P-ISSN: 2321-788X

Impact Factor: 3.025

Received: 02.01.2024

Accepted: 08.02.2024

Published: 12.02.2024

Citation:

Felix Sophia, S.
“Impact of Research and Development on The Profitability of Multinational Firms.”
Shanlax International Journal of Arts, Science and Humanities, vol. 11, no. S2, 2024, pp. 125–30.

DOI:

<https://doi.org/10.34293/sijash.v11iS2-Feb.7435>

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Abstract

R&D is an important activity, hence the accounting of R&D becomes a significant one. The objective of the study is to analyse the impact of Research and Development activities on the profitability of the sample firms. Data for the study was collected from CMIE Prowess Database for the period of 10 years from 2008 to 2017. The statistical tools namely Correlation and Regression were used for the study. The study found that the Research and Development activities had no impact on the profitability of the sample firms during the study period.

Keywords: Research and Development, Firm Performance, Profitability, Correlation and Regression.

Introduction

In the global economy; Multinational enterprises play a key role as their domestic and foreign activities generate one third of world value added and exports. Internationalization strategies may have an uneven impact on the performance of the firm, depending on the purpose of the investment and its destination. In today's world, where era of globalization begins, competitive advantage is needed to sustain in the market as product life cycle becomes shorter. Different measures can be employed in the assessment of performance (i.e., profit growth, increase in market share, and satisfaction) with the objective of analysing the degree of the firm's success in achieving its strategic goals of internationalization. The performance of the firm is considered as a control tool, as it is used to evaluate the outputs of a foreign affiliate in a certain period of time. As R&D is an important activity, the accounting of R&D becomes one of the significant accounts. R&D cost is also one of the most difficult expenditures in financial statements to analyze and interpret. The reasons are high uncertainty of future benefits, a significant lapse of time between the initiation of R&D activities and determination of success and evaluation problems due to the intangible nature of most R&D activities. As R&D is uncertain, the cost related to R&D can be incurred earlier than it supposes to be, thus increase expenses. That can be one of the earning management techniques such as income smoothing that is used by the managers to smoothen the income or profit. Furthermore, R&D is an investment, which should be treated as an asset, likewise how plant and equipment is treated.

Review of Literature

Sengun Yenyurt (2003) provides useful frameworks for performance measurement and strategic alignment. Based upon previous research, this paper presents an integrated framework for performance measurement for multinational companies and also provides directions for future studies. Madan Annavarjula, Sam Beldona & Farid Sadrieh (2005) brings about the importance of firm-specific moderators in understanding the relationship between multinationality and performance. Results of the study show that there is significant and positive moderation between multi nationality and performance. Saradindu Bhaduri & Amit S. Ray (2007) provides new insights into the relationship between technological capability and export performance, highlighting significant inter-industry differences. The study found that simple production engineering capabilities augment exports of both sectors, while efficiency of reverse engineering proves to be particularly important for pharmaceutical exports only. Natasha I.E. & Yanthi R.I. Hutagaol (2009) examined the relationship between R&D with firm's operation and market performance. The study found that there is no relationship between R&D and firm's operation and market performance. These findings imply that R&D activities in Indonesian firms are not yet perceived as an important element in firms' value added chain. Stefan Schmid and Katharina Kretschmer (2009) reviews the literature on performance evaluation and an integrative contingency framework. This serves as a tool to identify the factors influencing performance evaluation at corporate and at subsidiary level. Based on these findings, further research was suggested outside the classical tradition of contingency approaches. Chandan Sharma (2012) examined the impact of research and development (R&D) activities on firms' performance for the Indian pharmaceutical industry. The study found that the performance of foreign firms operating in the industry is more sensitive toward R&D than the local firms and propose further encouragement and incentives for doing in-house innovative activities in the Indian pharmaceutical industry. Filip De Beule and Dieter Somers (2012) examined the impact of the factors influencing the likelihood of foreign R&D; and the subsequent impact of foreign R&D on the parent firms' innovativeness. The study found that firm-specific technological advantages are important drivers of foreign R&D investments and that technology-seeking foreign R&D positively influences the innovation performance of Indian parent companies. Miguel Manjón Antolín, et.al., (2012) analysed whether the productivity gains associated with Learning-by-Exporting (LBE) depend on the intensity of the firm's exporting activity. The results from a representative sample of Spanish manufacturing firms indicate that the yearly average gains in productivity are larger for those firms that increase their export-to-sales ratio. Sorin M.S. Krammera, Roger Strange and Addisu Lashitew (2017), examined the export performance of EEFs by focusing on the combined effects of institutional elements and firm-specific capabilities to explain the two key dimensions of export performance (i.e., propensity and intensity). The results confirm that political instability and informal competition have robust effects on the export propensity of EEFs, whilst export intensity is contingent upon the availability of skilled workers and access to external technologies via licensing.

The earlier studies analysed the impact of Research and Development Intensity on firm performance. It is to be noted that the impact of Research and Development Intensity on the Performance of Multinational Manufacturing Firms listed in BSE was not carried out. Hence the present study aims to fill this research gap.

Statement of The Problem

R&D may take long time to get their reward and may even go waste if there is a failure. Thus, firms may have a potential reward and also a great uncertainty in its future return. Research and Development is considered an important determinant of profitability of the firms and can enable firms to provide higher value added product and services to the global world. The results of R&D

may be uncertain in the export market. It is bit difficult to predict how investment on such activities will impact on firm’s profitability and may affect its performance.

Objectives of The Study

- To analyse the relationship between R&D expenditure and the profitability of the sample firms.
- To analyse the impact of R&D expenditure on the profitability of the sample firms.

Hypothesis of The Study

- H01: There is no relationship between R&D expenditure and the profitability of the sample firms.
- H02: There is no impact of R&D expenditure on the profitability of the sample firms.

Methodology of The Study

• Selection of the Sample Size

The constituents of NSE MNC index was considered for sample selection. The Index constitutes 15 companies. Among these 15 companies, the data was not available for 5 companies. Hence the remaining ten companies namely: ABB India Ltd., Ashok Leyland Ltd., Bosch Ltd., Britannia Industries Ltd., Castrol India Ltd., Cummins India Ltd., Hindustan Unilever Ltd., Maruti Suzuki India Ltd., Maruti Suzuki India Ltd. and Vedanta Ltd. constitute the sample.

• Period of the Study

The study covers the period of 10 years from 2014 to 2023.

• Source and Collection of the Data

The secondary data relating to the study was collected from the CMIE “PROWESS” Database.

Limitations of The Study

This study suffers from the following limitations.

- All the limitations of secondary data are also applicable to this study.
- The periods of study covers data only for 10 years.
- All the constraint of the tools are also applicable to this study.

Analysis and Interpretation

• Computation of the Variables

The study considers Profit as the dependent variable which constitutes the Net Profit after Tax. The independent variable such as Research and Development Intensity which is computed using the formula: (R&D Expenditure/Sales), Import Intensity which is the sum of Import of Capital goods and Raw materials / Sales. Borrowings, includes total borrowings, including all forms of debt, secured or unsecured. The net fixed assets are the total fixed assets, net of accumulated depreciation, that are used for producing goods and services.

**Table 1 Results of Descriptive Statistics of
The Sample Firms During the Study Period**

	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
PAT	6.38	1.03	0.47	1.97	0.80
RDI	0.00	0.01	1.92	5.15	8.07
II	149.48	333.42	2.59	7.86	21.04
NFA	7.17	1.16	0.19	1.68	0.79
Borrowing	8.90	1.00	-0.40	2.13	0.58

Source: Data collected from Prowess Database and computed using E-views 7.0

II=Import Intensity, NFA = Net Fixed Assets, PAT = Profit after tax and RDI = Research and Development Intensity.

Table 1 shows the results of Descriptive Statistics for the sample firms during the study period. The mean value was positive for all the variables such as Borrowings, Import Intensity, Net Fixed Assets, Profit after and Research and Development Intensity for all the sample firms during the study period. Import Intensity recorded the highest mean value 149.48 and Research and Development Intensity recorded the lowest mean value 0.00. The volatilities (Standard Deviation) exhibited low volatility except Import Intensity exhibited high volatility. The skewness was positive and skewed towards right. The Kurtosis value was greater than the normal distribution value 3 and it indicates leptokurtic distribution except for Net Fixed Assets, borrowings and Profit after tax it was less than 3 and indicates platykurtic distribution. The Jarque-Bera value was greater than 5 which indicates normality except for borrowings, Net fixed assets and Profit after tax it was lesser than 5 which indicates non normality of the distribution.

Table 2 Results of Correlation analysis of The Sample Firms During The Study Period

		RDI	II	NFA	Borrowing
PAT	Pearson Correlation	-0.24	0.55	0.61	0.23
	Sig. (2-tailed)	0.51	0.10	0.06	0.51

Source: Data collected from Prowess Database and computed using SPSS 16.0

II=Import Intensity, NFA = Net Fixed Assets, PAT = Profit after tax and RDI = Research and Development Intensity.

Table 2 shows the results of the correlation analysis of the sample firms during the study period. The variable Profit after tax did not witness any relationship with Research and Development Intensity, Import Intensity, Net Fixed Assets and Borrowings. Hence the null hypothesis H01: “There is no relationship between R&D expenditure and the profitability of the sample firms” is accepted.

Table 3 Showing Model Summary of Regression Result For The Sample Firms

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.709	0.503	0.106	0.974
a. Predictors: (Constant), Borrowings, NFA, RDI, II				
b. Dependent Variable: PAT				

Source: Data collected from Prowess Database and computed using SPSS 16.0

II=Import Intensity, NFA = Net Fixed Assets, PAT = Profit after tax and RDI = Research and Development Intensity.

Table 3 shows the results of model fitness for Research and Development and Firm Profitability with Profit after Tax as dependent and Borrowings, Net Fixed Assets, Research and Development Intensity and Import Intensity as independent variables. It is noted from that 70.9% relationship was noticed between Profit after tax and Borrowings, Net Fixed Assets, Research and Development Intensity and Import Intensity. Further only 50.3% of variation in Profit was explained jointly by the other variables. However the R square value indicates that the model is not good.

Table 4 Showing Anova Result for The Sample Firms

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.80	4	1.20	1.27	0.39
	Residual	4.75	5	0.95		
	Total	9.55	9			
a. Predictors: (Constant), Borrowing, NFA, RDI, II						
b. Dependent Variable: PAT						

Source: Data collected from Prowess Database and computed using SPSS 16.0

Table 4 shows the results of Analysis of Variance for the sample firms, with profit after tax as Dependent and Borrowings, Net fixed assets, Research and Development Intensity and Import Intensity as independent variables. The F statistic value was found to be 1.27. The ‘p’ value was 0.39 which is greater than 0.05. Hence the H02: “There is no significant impact of R&D expenditure on the profitability of the sample firms” is accepted.

Table 5 Showing Co-Efficient Result for the Sample Firms

Model		Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
				Beta		
1	(Constant)	3.70	3.65		1.01	0.36
	RDI	-51.63	63.74	-0.34	-0.81	0.45
	II	0.00	0.00	0.18	0.41	0.70
	NFA	0.51	0.41	0.57	1.22	0.28
	Borrowing	-0.10	0.44	-0.09	-0.22	0.83
a. Dependent Variable: PAT						

Source: Data collected from Prowess Database and computed using SPSS 16.0

Table 5 explains the co-efficients results during the study period. It is to be noted from the results that ‘p’ value of none of the selected variables was less than 0.05. Hence it is clear that the selected variables namely Import Intensity, Net Fixed Assets, Borrowing and Research and Development Intensity had no impact on the Profitability of the sample firms during the study period.

Findings and Implications

The study examined the impact of the selected variables on the profitability of the sample firms during the study period. The major findings of the study were: the results of the correlation analysis indicate that the variable Profit after tax did not witness any relationship with Research and Development Intensity, Import Intensity, Net Fixed Assets and Borrowings. Hence there is no significant relationship between Research and Development and Profitability of the sample firms during the study period. The co-efficients of regression analysis of research and development and profitability of firms indicated that the selected variables had no impact on the Profitability and Performance of the sample firms during the study period.

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