Ranking Corporate Characteristics for Pharmaceuticals Profitability using Logit Model

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Abstract

This paper reveals the result of opinon survey analysis regarding the corporate characteristics for pharmaceuticals profitability based on questionnaire survey of 209 respondents. Among the corporate characteristics factors, the most important corporate characteristics factor appeared to be the new products while the least important ones appeared to be in bound logistics, firm infrastructure, HRM, and out-bound logistic. Likewise, among the impact factors for pharmaceuticals growth, the most important impact factor was the stiff competition with foreign companies whereas infrastructural investment and management expertise were the least important ones. Logit model shows that among the corporate characteristics factors, new product has the highest odds ratio whereas among the macroeconomic factors, interest rate has the odds ratio while explaining the profitability of pharmaceuticals companies.

Introduction

Firm performance, return and profitability, which are considered as interchanging words in finance literature, are chosen by many finance researches as fundamental research topic. Value maximization, cost of capital reduction and company profitability are the financial intent of most of the corporate houses, which accepts as the key idea in management that concentrates on the reason to answer why corporate present competitive performance in the highly competitive environment (Butler et al., 2012). Similarly, value maximization of the company has emerged as central issue in finance in corporate houses where profitability is observed as a key source of earnings gained from corporate revenues after considering all expenses. In this context, Cohen (1989) has stated that the degrees of corporate earnings specific to return or profitability are quite important for the corporate houses.

Regarding the discourse of factors determining corporate profitability, review and revisit of empirical evidences in the history of finance are found to be quite important. Initially, capital structure concern was

taken; Modigliani and Miller stated that company's capital structure is not a factor in its value and stated clearly that market value is independent to firm's capital structure (Modigliani & Miller, 1963). Modigliani – Miller Theorem made the foremost and significant priority and then, a variety of models has gained space in research environment that aim to identify the factors affecting profitability. Many authors from around the globe have proposed different models that explain the corporate profitability.

As a significant issue in finance literature, profitability analysis has also attracted attention to the academic researchers and corporate owners as a special reference for the decision making. The attention can be found visible in the studies of corporate characteristics and relate to profitability. According to Simon (1962) and Anderson (1967) study, they were concerned with size and profit. Similarly, Hall and Weiss (1967) and Whittington (1980) also focused on size and profitability. Whereas, Jones (1967) study is primarily concentrate to R&D and profitability. More specifically, pharmaceuticals research and development (R&D) and its key determinants is obvious in the areas of identifying key determining factors for profitability (Grabowski & Vernon, 2000). While connecting with performance, the term 'financing' also better explains the company profitability (Bates, 1971). In a similar way, there are also studies that are based on size and growth pattern matter in shaping structure of the company (Gupta, 1969). Shepherd (1972) showed the elements that determine market structure.

Connecting with researches around the globe relevant to key corporate characteristics, Wang (2002) evidenced the key aspect of managing liquidity and its association with firm performance of Japanese and Taiwanese companies. Similarly, Baum et al. (2006) documented the impact of debt on profit of Germany based and US based companies connecting with their association. There are few more others studies who were primarily gave consideration on linking firm specific factors on profitability such as (Raheman & Nasr, 2007; Dong & Su, 2010; Grosse-Ruyken et al., 2011; Quayyum, 2012; Uyar, 2009; Karadagli, 2012).

The central concept of corporate profitability and its determining factors remains within the limit of corporate characteristics. To add empirical contributions, stating the relationship with different factors, Caballero et al. (2007) stated loan structure of the company is the key determinant of corporate profitability. Zariyawati et al. (2009) finding showed profitability as the higher preference on analyzing cash conversion cycle, stating to recommend reducing CCC days. On contrary to this, Lyroudi and Larzridis (2000) indicated affirmative relationship between cash conversion cycle and profitability. Discourse relating to the U.S. pharmaceuticals industry presented substantial positive association between profitability and inventory turnover along with debtors of the company (Leahy, 2012).

Apart from the above mentioned several other dimensions of profitability have captured the interest of finance researchers. There are the studies that have concluded significant relationship between research and development with profitability (Nord, 2011; Erickson & Jacobson, 1992; Bhagwat et al., 2001).

Concerning pharmaceuticals and manufacturing companies, many studies show that cost ratios along with others company specific factors influence the profitability. The research from the Indian cement industry showed that company size, different costs, internal liquidity and inflation rate have important influence on profitability of the company (Bhayani, 2010). In Nigerian study, connecting cost ratios to some extent, Eluyela et al. (2016) recommended to apply retrenchment strategy relevant to administrative overhead and production cost in order to gain comfortable amount of profit.

Apart from above mentioned empirical studies of the advanced economy based countries also have shown significance of the association of corporate characteristics with profitability (Jones, 1967) such as measurement and interpretation of pharmaceuticals profitability (Cooper & Parker, 1968), sensitivity analysis of R&D on pharmaceuticals profitability (Grabowski & Vernon, 1982), R&D intensity and profitability (Hundley et al., 1996), effect of product innovation (Roberts, 1999), key determinants of Indian pharmaceuticals profitability (Chander & Agrawal, 2008).

The above discussion shows that the studies dealing with the corporate characteristics affecting profitability are of great importance. Despite of so many studies, there is no confirmed result yet as to which of the corporate characteristics actually determine profitability that also in the context of Nepalese pharmaceuticals companies.

Literature review

The foundation of overall literature review of this study focused on empirical review from many researches, their key methodologies, major findings and concluding remarks that are appropriate to connect the central issue of this study. This section contains previous literature pertaining to the scope of profitability. Simultaneously it demonstrates the relationship of profitability with corporate characteristics. Table 1 provides a brief overview of some major studies.

Table 1: Review of Literature on Profitability of Pharmaceuticals Company

Study	Key findings
Jones (1967)	Profitability of large pharmaceuticals company is determined by large investment in research and development, capital investment and sales income.
Cooper & Parker (1968)	The size of research in pharmaceuticals affects the rates of return of fifty -six pharmaceuticals companies in the UK.
Grabowski & Vernon (1982)	10% real rate of return required 19 years where as 8% rate of return required 12 years to break even for new pharmaceuticals product in US.
Senn & Rosati (2003)	Patent protection has a considerable influence on profitability.
Dius (2007)	Investment in R&D matters in pharmaceuticals company
Chander & Agrawal (2008)	Corporate characteristics such as age, R&D investment, and efficiency are important for the profitability of Indian pharmaceutical companies
Montoya et al. (2010)	Detailing and sampling increase a pharmaceutical company's profit in the United States.
Aktar et Al. (2012)	The performance of pharmaceutical companies in Bangladesh depends on its distribution strength, quality control, good management, good training program, use of modern technology, and product innovation.
Mazumdar et al. (2012)	Large pharma companies in India profit more as a result of R&D investments
Dey et al. (2013)	Average profitability indicators for Square pharmaceuticals are higher except gross profit ratio and operating profit ratio among the listed pharmaceuticals companies of Bangladesh.
Jaisinghani (2016)	R&D intensity and performance matters in Indian pharmaceutical industry
Panda (2017)	R&D investment has a significant impact on the profitability of Indian pharmaceutical companies

Jones (1967) made a study relevant to research and development profitability considerations in a large company. The study concluded that research and development have great deal of importance for pharmaceuticals profitability in large company. Furthermore, the result also demonstrated that the size of the company, sales income and capital cost are important variables influencing profitability. Likewise, Cooper and Parker (1968) investigated the measurement and interpretation of profitability in fifty-six UK pharmaceutical companies from 1954 to 1964. Their study publicized that the size of each subsidiary's research program influences rates of return.

Linking up with the above-mentioned studies, Senn and Rosati (2003) emphasized the link between patent protection and profitability. The study focused on the issue of patents and protection, which they found to be more important than the matter shown in statistics. Correspondingly, Dius (2007) investigated the relationship between R&D investment and sales performance of the world's 151 largest pharmaceutical companies and discovered a strong relationship.

From 1995-6 to 2004-5, Chander and Agrawal (2008) examined the factors influencing the profitability of 50 Indian pharmaceutical companies using a variety of corporate characteristics variables such as size, R&D, company age, advertising strength, and liquidity, efficiency, and debt ratio. The research exposed that R&D

investment, company experience (age), and company efficiency all have a significant impact on pharmaceuticals profitability.

In their attempt of discovering how profitability is influenced in the pharmaceutical context in the United States, Montoya et al. (2010) investigated what impact detailing and sampling practices make upon the profitability of pharmaceutical companies in the United States. Their investigation led to the revelation that rather than marketing expenditure, detailing and sampling are the most important tools for increasing profitability. Likewise, Aktar et al.'s (2012) study that was specifically concentrated on firm performance of pharmaceutical industry in Bangladesh established that the financial performance in the pharmaceutical business is largely dependent on distribution strength, quality control, good management, good training program, use of modern technology, and product innovation. In a nutshell, the study indicated that HRM practices have a major impact on the firms' performance.

Simultaneous to the study concentrated in Bangladesh, Mazumdar et al. (2012) investigated the impact of corporate characteristics on the profitability of Indian pharmaceutical companies from 1991 to 2005. The investigation suggested that among the corporate characteristics factors, R&D is a possible strategic option for achieving higher competitiveness and profitability in large companies.

Similarly, Dey et al. (2013) made a comparison of profitability of listed pharmaceuticals companies of Bangladesh. Results showed that average profitability indicators for Square pharmaceuticals are higher except gross profit ratio and operating profit ratio. Panda (2017) made extensive study on Indian pharmaceutical industry mainly focused on analyzing R&D activities and profitability. The study revealed that R&D investment leads to increase in profitability of Pharmaceuticals Companies in India. Similarly, a study of 55 pharmaceutical companies in India from 2005 to 2014 revealed that R&D acted as the most important factor influencing the company's profitability (Jaisinghani, 2016).

Several quantifiable readings have been conducted in order to determine the company's profitability determinants. Such analysis, however, have produced conflicting results. The purpose of this study was to determine the effect of the corporate characteristics on the pharmaceuticals profitability. The theoretical and empirical analysis found profitability as vital in management of pharmaceuticals companies.

Many studies have indicated that there is linkage of corporate characteristics with profitability. On the basis of literature review, certain study gaps were found. Studies related to corporate characteristics factors and profitability has been conducted in developed and developing countries in ample amount. Nonetheless, dearth of comprehensive studies in developing countries like Nepal was found. Amid this, need of academic study to know the real situation of Nepal in relation to the developed countries can be considered essential. And since this study has focused on examining the discourse of profitability with special reference to the pharmaceutical companies, it carries great academic pertinence in relation to the developing countries like ours.

There are a number of studies related to corporate characteristics s affecting profitability. However, the existing literatures show no uniformity in the findings. Moreover, though the studies on corporate characteristics are extensively done, the empirical results found in one country, region or state cannot be generalized within the framework of another region or state. In addition to these, if the context of Nepal is to be referred to, only few efforts have been made to examine the issues related to the corporate characteristics affecting profitability. Within the existence of this praxis, the study has primarily intended to fill the research gap pertaining to the Nepalese context. Correspondingly, this study is distinct from the previous studies in terms of sample size, nature of the sample firms and the research methodology. It has covered 209 respondents from all running pharmaceuticals companies. Thus, it is believed that this study will add new knowledge in the arena of research with its attempts of examining the corporate characteristics affecting profitability of Nepalese pharmaceuticals companies. Additionally, this study is even expected to provide large scope of information to other researchers.

Research design and methods

This research has employed both qualitative & quantitative analytical techniques, taking data from primary source i.e. respondents. In the line of research, the study has made attempt to address the major aspects of the research considering the deeper understanding of a topic, systematic and in-depth evaluation of the research question through qualitative research. Primary data sources used in the study is to assess respondents' opinions on factors such as pharmaceutical profitability, pharmaceutical growth, pharmaceutical price determination, and the activities that must be undertaken to improve Nepalese pharmaceutical performance.

Method of Data Analysis

The primary goal of data analysis in this study is to investigate the variables that influence pharmaceutical profitability in the context of Nepal.

The study is principally focused on identifying the determinants of pharmaceuticals profitability. The result from the opinion of pharmaceuticals executives is also given special importance for analysis. So, the primary data analysis has been carried out on the basis of respondents view and accordingly the principal focus of the study of construction of key determinants of pharmaceuticals profitability. Respondent's personal and institutional characteristics and the descriptive statistics of corporate characteristics as per the respondents view and their ranking, factors of pharmaceuticals growth, and their ranking also been presented in the study. The study has tested "reliability test" for the likert scale data to ensure the consistency of the data set from participants of primary data. The study has used logit model in order to identify the most significant determining factors among the corporate characteristics.

Findings

Qualitative findings and their analysis connecting with the results obtained from quantitative analysis is the core effort of this study. The findings obtained from primary survey consisting of both quantitative and qualitative information have been presented so as to justify core of this research objectives.

In this section, reports obtained from survey data taken from key person of pharmaceuticals companies engaged in many areas like corporate management, financial administration, operation management and marketing management are exhibited and interpreted. Based on the purpose of study and research plan, the multipart questionnaires were administered to all executives of registered pharmaceuticals companies of Nepal and out of them, 209 usable questionnaires were collected for the study purpose.

The survey questionnaire was primarily given attention, taking into account basic information of the respondents, and focused on corporate characteristics factors on profitability. The profile of respondents consisting of the key responses based on the basic background is displays in table 2A to 2F. The respondents concerning their designation in the company, which has portrayed in, table 2A shows that highest number of respondents for the study survey was holding the designation of manager (i.e. 47%). Since large of employees are officers in comparison to managers in the pharmaceuticals company, the survey contains 32% officers for sharing their opinion on the research. Similarly, the top-level corporate heads (called general manager / director of the company), hold 21% as respondents in this survey research.

Regarding the pharmaceuticals companies, people assume these to be technical based companies composing mostly of males. Presenting the aspect of male or female representation in the survey, this study has shown higher portion of male respondents, i.e. 86% to have outnumbered i.e. 14% of the female respondents. Similarly, concerning the age of the respondents in the survey research, this part is subject to company's profile or the industry profile in the areas. The industry consisting of large number of companies having long decades of establishment have matured higher age people in the key executives position having good retention exercises. In the case of Nepalese Pharmaceuticals Company, the history of Pharmaceuticals Company is not so long. Hence, the respondents of this survey research showed that highest portion of the age group are above 35 years (i.e. 47%), followed by 37% respondents who range between 25 years to 35 years, while only 16% of the respondents are below 25 years of age as shown in table 2 C.

Table 2 Basic Personal Characteristics of the Respondents

A. Respondents' designation

Designation	Frequency	%
Corporate- level (General Manager/Director)	4 4	2 1
Business-level-manager	9 8	4 7
Functional-level-Officer	6 7	3 2
	2 0 9	1 0 0
B. Gender wise		
Gender	Frequency	%
Male	1 8 0	8 6
Female	2 9	1 4
	2 0 9	1 0 0
C. Age wise		
Age	Frequency	%
Below-2 5	3 3	1 6
2 5-3 5	7 8	3 7
Above-3 5	9 8	4 7
	2 0 9	1 0 0
D. Academic qualification wise		
University Degree	Frequency	%
Bachelor's-Degree	1 6 5	7 9
Master's-Degree	3 6	1 7
Above Master's-Degree	8	4
	2 0 9	1 0 0
E. Company's age denoted by establishment		
Company-Age	Frequency	%
6-1 0	8	4
1 1-1 5	1 1 6	5 5. 5
1 6- 2 0	7 0	3 4 . 5
Above-2 0	1 5	7
	2 0 9	1 0 0
F. Experience in R&D involvement		
Experience in years	Frequency	%
0 to 5	1 0	5
6 to 1 0	1 6 6	79
1 1 to 1 5	3 3	16
	2 0 9	1 0 0

Pharmaceuticals Company is generally accepted as knowledge-based company when it is compared with other companies. And this truism was found relatable to the study since most of the respondents representing the pharmaceuticals were found to be educated with minimum university degree, and possessing the capability to come front in the functional, business, or corporate lead. This study consists of highest number of respondents having bachelor's degree i.e. 79%, 17% holding masters' degree and 4% respondents having philosophical degree as shown in table 2D.

The notable information of pharmaceuticals companies in Nepal is that their experiences don't date back to century or half a century. Relating to this, the study's survey respondents who are working in the company, state the age of the company as shown in table 2E. The table shows that 4% of the companies range between 6-10yeras, 55.5% companies age between 11-15years, 34.5% are between 15-20 years and those who have the experience of more than 20years count 16%.

R&D is the key phase in Pharmaceuticals Company and it is relevant to present the real strength in the pharmaceuticals industry. The survey information also made its effort to include the respondents' particular company having experience of R&D of their own lab as shown in table-5.1F. Survey information showed 79% of the respondents' companies do have R&D experience of 6-10years, 16% have 11-15years & 5% have below 5years.

Logit Model on Corporate Characteristics Factors

Table 3 shows that among the corporate characteristics factors, size of the company, sales volume, number of divisions, new products, number of medical representatives, value chain, investment in R&D,

promotion effect in marketing and capital structure positions are statistically significant in predicting the odds of influencing profitability where new products and number of medical representatives have statistically positive effect on the odds of profitability. Among the factors, new product has the highest odds ratio of 1.47 ($p < 0.05$). This means that holding all other factors in the model constant, the odds of new product is 1.47 times more likely than the odds of debt i.e. use of loan. Result shows that respondents gave greater emphasis to new product introduction as the main factor determining profitability. Similarly, another corporate characteristics factor is the number of medical representatives, where the odds ratio is 1.39 ($p < 0.01$) times more likely than the odds of debt.

In regards to GMP certified effect, this factor is not statistically significant. The odds ratio of other factors like: capital structure (0.99), promotional effect in the market (0.93), number of division (0.55), sales volume (0.38), investment in R&D (0.31), size of the company (0.08) and value chain (0.075) are statistically significant but are less likely factors than the reference factor, i.e. use of loan.

The results are based on logit model N = 2288 from 11 factors including use of loan (debt) as the reference factor. The test of hypotheses of B=0 are based on Wald's statistic, df=1. Parameters (B) having "–ve" sign shows that the existence of that "parameter" increases-the-likelihood of smaller-values of true-response. The Wald statistic is the square of the ratio of the parameter estimate to its standard error. Odds ratio exp (B) is the calculated exponential value of given B from second column. Pseudo R-square is 0.249, -2log likelihood final is 446.78($p < 0.01$), Goodness of fit Pearson chi-Square is 222.52 ($p < 0.010$).

Table 3 - Logistic Regression on Corporate Characteristics Factors Affecting Profitability.

Factors	*B*	Std. Error	Wald-statistic	Odds-ratio-exp(B)	95%-confidence-interval-for-exp(B)	
					Lower	Upper
Size of the company i.e. Total Assets	-2.521*	0.184	186.744	0.080	0.035	0.062
Sales volume of the company	-0.968*	0.177	29.764	0.380	0.133	0.224
Number of division	-0.603*	0.177	11.571	0.547	0.598	0.984
New Products	0.384**	0.178	4.685	1.469	2.642	4.412
GMP certified effect	0.278	0.177	2.461	1.321	0.056	0.115
Number of medical representatives	0.332***	0.177	3.493	1.393	0.268	0.538
In bound logistic, firm infrastructure, HRM, out-bound logistic	-2.584*	0.185	195.115	0.075	0.387	0.775
Investment in R&D	-1.158*	0.178	42.363	0.314	1.037	2.080
Promotional effect in the market	-0.568*	0.177	10.270	0.567	0.933	1.869
Capital structure position	-0.008	0.177	0.002	0.992	0.984	1.973
Use of loan i.e. debt(a*)						

Note.

1. Link function: Logit.

2. (*), (**), (***) sign-shows that the data-results are statistically-significance at 1%, 5% & 10%-respectively.

3. a* is the reference category

Table 3 shows the internal consistency on the corporate characteristics factors based on Cronbach's alpha in order to show the result on how closely related a set of factors as a group. The overall Cronbach's alpha of the 11 corporate characteristics factors found 0.632, this means that the corporate characteristics factors have relatively sound internal consistency. Table also shows that all the factors' alpha value (i.e. Cronbach's Alpha if item deleted column of table 5.3) lower than 0.632 (reliability value of the scale all 11 factors), which means there is no need to remove any factors and all the corporate characteristics factors under survey are included for analysis and they do have sound reliability.

Table 4 Cronbach's Alpha on Surveyed Ranking Score on Corporate Characteristics (if, Item-Deleted)

Corporate Characteristics	Scale-mean	Scale-variance	total-correlation	Cronbach's-Alpha
Size of the company i.e. Total Assets	33.039	25.959	0.376	0.599
Sales volume of the company	32.0585	23.457	0.307	0.609
Number of division	31.7805	25.849	0.296	0.609
New Products	31.1707	25.466	0.323	0.604
GMP certified effect	31.2537	25.7	0.292	0.609
Number of medical representatives	31.2244	24.802	0.37	0.594
In bound Logistic, Firm Infrastructure, HRM, Out-bound logistic	33.0634	26.707	0.279	0.613
Investment in R&D	32.1073	24.439	0.228	0.63
Promotional effect in the market	31.761	26.457	0.208	0.625
Capital Structure position	31.439	25.944	0.2	0.629
Use of Loan i.e. Debt	31.3951	25.005	0.405	0.59

Discussion

Addressing the central issue, this study examined the corporate characteristics affecting profitability of Nepalese pharmaceuticals companies. Corporate characteristics have shown important influence over return of the company. Profitability in business houses becomes crucial for the aggressive growth and high level of competitiveness in the industry. The studies associated with varieties of methods were applied in the quest of justifying the objectives to present the contribution of factors determining pharmaceuticals return. Simply knowing, pharmaceuticals return, hypothetical based and empirical based research gave special input that can be used for decision making in the pharmaceuticals industry. In recent years, studies on the key point of corporate profitability and/or industry profitability have put forward to the tune of identifying the effect of significance of the explanatory variables. True picture of corporate characteristics and macroeconomic variables specific to the pharmaceuticals industry was the major concern of the study, and the study has made effort to present quantitative and qualitative sense of understanding to the public. For instance, Dius (2007) examined 151 pharmaceuticals companies from worldwide and found that sales revenue and R&D expenditures have strong relationship. Chander and Agrawal (2008) assessed the corporate characteristics like rage, ME, R&D matters in determining profitability of Indian pharmaceuticals industry. Similarly, Chawla et al. (2010) demonstrated that reduction of CCC enhances the profitability whereas Bhayani (2010) confirmed that operating cost ratio is one of the key determinants of profitability and Jamali and Asadi (2012) showed that management efficiency and profitability are highly correlated each other.

The analysis of primary data was based on percentage frequency distributions, cross-tabulation, and mean ranking scores. The survey results of pharmaceuticals executives and their opinion in connection with the quantitative result of the study. Ordinal regression model has been used to identify the most significant factors influencing pharmaceuticals profitability based on respondents' opinion. The finding from the field visit observation is also included in the study.

Conclusions

Based on the impact examination of corporate characteristics variables on profitability, this study further explains that the importance of GMP, i.e. good manufacturing practices certification or its accreditation is vital for enhancing the profitability of the Pharmaceuticals companies in Nepal. Furthermore, age matters in the Nepalese pharmaceuticals companies, which also explains that older pharmaceuticals companies are reaping growth profitability in the Nepalese business environment and show the future long-term growth prospect. The study also suggests the analysis of cost ratio is vital for the profitability of Nepalese Pharmaceuticals Company, which means that higher incurring cost specific to administration, financing and even in marketing lead to decline the profitability. Most importantly, the study has provided clear space to justify that aggressive marketing cost with respect to sales ratio will not enhance profitability of Nepalese pharmaceuticals companies.

Reference

- Aktar, S., Islam, M. S., & Hossen, S. M. (2012). Human resource management and performance in Bangladesh: An empirical study on pharmaceuticals industry. *Asian Business Review*, *1*(1), 121-125.
- Anderson, T. A. (1967). The effect of size on profits in manufacturing industries, in Pfeffer, I. (ed), *The Financing of Small Business,* Macmillan, New York, 67–81.
- Bates, J. (1971). *The financing of small business,* Sweet and Maxwell, London.
- Baum, C. F., Schafer, D., & Talavera, O. (2006). The effects of short-term liabilities on profitability: A comparison of German and US firms. *Boston College Working Papers in Economics 636*, Boston college department of Economics.

- Bhagwat, Y., DeBruine, M., & Gondhalekar, V. (2001). R&D leverage – A measure to evaluate the impact of R&D on earnings of pharmaceutical companies. *Journal of Research in Pharmaceutical Economics, 11*(3-4), 55–68.]

- Bhayani, S. J. (2010). Determinants of profitability in Indian cement industry: An economic analysis. *South Asian Journal of Management*, *17*(4), 6-20.

- Butler, F. C., Martin, J. A., Perryman, A. A., & Upson, J. W. (2012). Examining the dimensionality, reliability, and construct validity of firm financial performance.

- *Strategic Management Review*, *6*(1), 57-74.

- Caballero, B, S. Garcia-Teruel, P.J., & Martinez-solano, P.(2010).Working capital management in SMEs. *Accounting and finance*, *50*(3), 511-527.

- Chander, S., & Agrawal, P. (2008). Determinants of corporate profitability: An empirical

- study of Indian drugs and pharmaceutical industry. *Sage Publications Ltd., 12*(2), 51-61.

- Cohen, W. A. (1989). The Entrepreneur and small business financial problem solver. *John*

- *Wiley & Sons*, New York.

- Cooper, M., & Parker, J. (1968). The measurement and interpretation of profitability in the pharmaceutical industry. *Oxford Economic Papers*, *20*(3), 435-441.

- Dey, M., Dey, S., & Biswas, S. K. (2013). Comparison of profitability of listed pharmaceutical companies of Bangladesh. *Journal of Commerce and Accounting Research*, *2*(2), 33.

- DIUS (2007). The R&D scoreboard 2007: The top 850 UK and 1250 global companies by R&D investment –data tables, department for innovation. *Universities and skills*, London.

- Dong, H. P., & Su, J. (2010). The relationship between working capital management and profitability: A Vietnam case. *International Research Journal of Finance and Economics*, *49*, 59-67.

- Eluyela, D. F., Akomolafe., J. A., & Ilogho, S. O. (2016). Cost management and performance of manufacturing: A study of listed firms in Nigeria.

- *International Business Information Management Association*, Spain.

- Erickson, G., & Jacobson, R. (1992). Gaining comparative advantage through discretionary expenditures: The returns to R&D and advertising. *Management Science*, *38*(9), 1264-1279.

- Grabowski, H., & Vernon, J. (2000). The determinants of pharmaceutical research and development expenditures. *Journal of Evolutionary Economics*, *10*(1-2), 201-215.

- Grosse-Ruyken, P. T., Wagner, S. M., & Jonke, R. (2011). What is the right cash conversion cycle for your supply chain?. *International Journal of Services and Operations Management (IJSOM), 10*(1), 13-29.

- Gupta, M. C. (1969). The effect of size, growth, and industry on the financial structure of manufacturing companies. *Journal of Finance*, *24*(3), 517-529.

- Hall. M., & Weiss, L. (1967). Firm size and profitability. *The Review of Economics and Statistics*, *49*(3), 319 – 331.

- Hundley, G., Jacobson, C. K., & Park, S. H. (1996). Effects of profitability and liquidity on R&D intensity: Japanese and U.S. companies. *The Academy of Management Journal*, *39*(6), 1659-1674.

- Jaisinghani, D. (2016). Impact of R&D on profitability in the pharma sector: An empirical study from India. *Journal of Asia Business Studies*, *10*(2), 94-210.

- Jones, D. (1967). Research and development profitability considerations in a large company.

- *Operational Research Society*, *18*(3), 207-217.Karadagli, E. C. (2012). The effect of working capital management on the profitability of Turkish SMEs. *British Journal of Economics, Finance and Management Sciences*, *5*(2), 36-44.

- Leahy, A. S. (2012). The determinants of profitability in the pharmaceutical industry. *American Journal of Health Sciences, 3*(1), 37-42.

- Lyroudi, K., & Larzridis, J. (2000). The cash conversion cycle and liquidity analysis of the food industry in Greece. *Paper presented at the European*

Financial Management Association Conference, Athens.

- Mazumdar, M., Rajeev, M., & Ray, S. C. (2012). Sources of heterogeneity in the efficiency of Indian pharmaceutical firms. *Indian Economic Review*, New Series, *47*(2), 191-221.

- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Review*, *53*(3), 433-443.

- Montoya, R., Netzer, O., & Jedidi, K. (2010). Dynamic allocation of pharmaceutical detailing and sampling for long term profitability. *Marketing Science*, *29*(5), 909-924.

- Nord, L. J. (2011). R&D investment link to profitability: A pharmaceutical industry evaluation. *Undergraduate Economic Review*, 8(1), 1-14.

- Panda, S. (2017). Influence of research and development (R&D) cost on profitability: A study of Indian pharmaceutical sector. *Splint International Journal of Professionals*, *4*(1), 60-66.

- Quayyum, S. T. (2012). Relationship between working capital management and

- profitability in context of manufacturing industries in Bangladesh. *International Journal of Business and Management*, 7(1), 58-69.

- Raheman, A., & Nasr, M. (2007). Working capital management and profitability – case of

- Pakistani firms. *International Review of Business Research Papers*, *3*(1), 279-300.

- Robert, D. G. (2008). Effect of macroeconomic variables on stock market returns for four emerging economies: Brazil, Russia, India and China. *International Business & Economics Research Journal,* 7 (3), 1-8.

- Senn, S., & Rosati, N. (2003). Pharmaceuticals, patents and competition: Some statistical issues. *Journal of the Royal Statistical Society*, Series A (Statistics in Society), *166*(3), 271-274.

- Shepherd, W. G. (1972). The elements of market structure. The Review of Economics and Statistics, *54*(1), 25-37. imon, L. J. (1962). Size, strength and profit. *Proceedings of the Casualty Actuarial Society*

- *Casualty Actuarial Society – Arlington*, Virginia, *49*, 41-48.Uyar, A. (2009). The relationship of cash conver

- sion cycle with firm size and profitability: An empirical investigation in Turkey. *International Research Journal of Finance and Economics*, 24, 186-193.

- Wang, Y. J. (2002). Liquidity management, operating performance, and corporate value:

- Evidence from Japan and Taiwan. *Journal of Multinational Financial Management*, *12*(2), 159-169.

- Whittington, G. (1980). The profitability and size of United Kingdom companies. *The Journal of Industrial Economics*, *28*(4), 335-352.

- Zariyawati, M. A., Annuar, M. N., Taufiq, H., & Abdul R. A. S. (2009). Working capital management and corporate performance: Case of Malaysia. *Journal of Modern Accounting and Auditing*, *5*(11), 47–54.