MEASURING THE IMPACT OF FINANCIAL RATIOS ON STOCK RETURNS: EVIDENCE FROM PHARMACEUTICAL COMPANIES IN INDIA

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ABSTRACT- The present study explores the impact of selected financial ratios on annual stock return for selected pharmaceutical companies listed on national stock exchange in India. The evaluated variables in the study are annual stock return, current ratio, inventory turnover ratio, asset turnover ratio and net profit margin. The time series data of 25 companies for a period of 5 years from April 2013 to March 2018 is used. Hausman test has been utilized to examine which model is suitable for analysing the panel data. Accordingly, Fixed Effect Model is found to be more suitable for the study. The results have showed a positive impact of Asset turnover ratio and a negative impact of current ratio and inventory turnover ratio on annual stock return.

KEYWORDS: Panel Data analysis, Pharma Industry, Financial ratios, Average Market Stock Returns

1. INTRODUCTION

In the present global scenario, the performances of businesses in a country play a crucial role in deciding its place at the world level. The GDP, unemployment rate and other macro-economic variables depend a lot on the effectiveness and efficiency of businesses. The market price of a stock changes based on the efficiency of businesses and the economy. The decision of an investor to buy or sell a share depends on its price level. Most of the investors do not have fundamental financial knowledge invest in shares based on their price movements.

Financial ratios help investors to analyze information in a meaningful way to decide on investment. It is a great aspect of research as ratios are used for financial analysis based on intuition and hearsay rather than their theoretical and statistical properties.

The most important decision for an investor is to select an appropriate stock. Portfolio construction can be done based on various quantitative models. The main aim of this paper is to statically examine and propose an approach of stock selection based on the influence of financial ratios on stock return.

2. REVIEW OF LITERATURE

Karaca Serdar Suleyman and Savsar Arif (2010) undertook a research to analyse the effect of financial ratios on firm value for Food-Drink-Tobacco and Basic Metal Industry listed on ISE 100 index in Turkey. Firm value was dependent variable and financial ratios were considered as dependent variables. Based on panel data nalysis, they concluded that there was a significant and positive relationship between receivables turnover and firm value. It was also detected that there is a significant and negative relation between inventory turnover and Return on Equity.

Oak Heena (2018) conducted a study based on panel data of 52 cement firms for a period of April 1997-2015. Energy intensity was the dependent variable while Perform-Achieve-Trade dummy variable (PAT), FDI intensity, Domestic Research & Development intensity, Import intensity, Export expenses and size intensity were the independent variables. The study showed PAT had a negative impact while FDI and size had a positive impact on energy intensity.

Alexakis Christos, Patra Theophano, Poshakwale Sunil (2010) explored the predictability of stock returns in the Athens stock exchange during 1993-2006 by using accounting information. The study results conclude that the selected set of financial ratios have information for predicting the cross-section of stock returns.

Rajapaksha R.M.D.S, Yapa D. Roshan (2016) performed an analysis to establish a relationship between share price and financial ratios of companies listed on the Colombo stock exchange. The results revealed a positive relationship between share price and Earnings per share, Dividend per share, Return on Equity, Return on Assets, Asset turnover, Price to Book value and Net Profit Margin. Based on Factir Analysis and Altman Z score it was found that the percentage of classifying, a successful company and an unsuccessful company correctly are 65% and 95% respectively.

Dadrasmoghadam Amir, Akbari Mohammadraza Seyed (2015) conducted a research to understand the relationship between financial ratios and stock prices in agriculture-related companies listed on the stock exchange of Iran. The sample period was 1999-2009. Independent variables like liquidity ratios liquidity ratios, activity ratios, profitability ratios and financial leverage ratios were used. The results showed a significant impact of debt ratio, current ratio and return on assets ratio on share prices.

Atmaca Metin, Demirel Engin (2017) examined 22 food and beverage sector companies listed on the Istanbul stock exchange for a period from 2008-2015 to analyse the relation between financial ratios and macro-economic variables like income, poverty level and Gini coefficient value. The study shows that there is a significant relationship between poverty level and cash ratio, sales profitability ratio and net working capital ratio.

Wijensundera A.A.V.I., Weerasinghe D.A.S., Krishna T.P.C.R., Gunawardena M.M.D. and Peiris H.R.I (2015) undertook a study to test the correlation between financial ratios and the predictability of stock returns. The research showed that ROE, EPS and MV/BV have a positive relationship with the stock returns.

The pharmaceutical sector has shown a major change since some years because of rise in competition, minimal growth and increasing regulatory challenges. So, it is important for the stakeholders to analyse the financial as well as stock performance of the companies they are interested in.

3. RESEARCH METHODOLOGY

3.1 Research Objective

To study the impact of choosed financial ratios on annual stock return of selected pharmaceutical companies in India.

3.2 Hypothesis

H_0: Financial ratios do not affect the annual stock return of companies.

H_1: At least one of the financial ratios affects the annual stock return of companies.

3.3 Sampling

In the present study a sample of 36 pharmaceutical companies listed on NSE500 Index on 31st March, 2018 is considered. Out of these companies, data for past 5 years i.e., 2013-14 to 2017-18 is available for only 25 companies. Hence, sample consists of 25 companies.

3.4 Data collection

In this study secondary data is used. Secondary data is collected from CMIE PROWESS database as well as from websites of National Securities Exchange and money control. Financial ratios are used as independent variables and Annual stock returns as dependent variables.

4. VARIABLES USED IN THE STUDY

The dependent and independent variables used in the study are shown in Table 1 below:

Table 1: Variables used in the study

Variables	Criteria used
Dependent variable	Annual stock return
Independent variables	1. Current Ratio (Liquidity)
	2. Inventory Turnover Ratio (Activity)
	3. Asset Turnover Ratio (Financial strength)
	4. Net Profit Margin (Profitability)

4.1 Annual Stock Return

The return on holding the stock for a year is taken as dependent variable. For example, the price of a share of Cipla Ltd. at the beginning of the year i.e., 1st April, 2015 and at the end of the year i.e., 31st March, 2016 is considered to calculate annual return.

4.2 Current Ratio (Liquidity Ratio)

Liquidity ratio is a very important tool of accounting which helps to explain the shot-term debt repaying ability of a company without any external financial assistance.

Current ratio describes the ability of a company to pay its short-term liabilities within a year. It compares current assets to current liabilities. It specifies the financial soundness of a company. It helps stakeholders to understand how a company can maximize current assets to satisfy its current liabilities.

4.3 Inventory Turnover Ratio (Activity Ratio)

An activity ratio is a financial measure that expresses to stakeholders as to how efficiently a company is utilizing its assets in order to earn cash and revenue.

Inventory turnover ratio is one kind of activity ratio. It reports the number of times a company sells its stock of goods during a year. It compares the cost of goods sold relative to its average inventory for a year.

A high inventory turnover ratio conveys that goods are sold quickly while a low inventory turnover ratio signifies low sales and excess inventory.

4.4 Asset Turnover Ratio (Financial strength)

Asset turnover ratio describes the capability of a company to use its assets to generate sales. The formula for asset turnover ratio is net sales divided by total or average assets.

A higher asset turnover ratio is favourable. High asset turnover ratio indicates that the company uses its assets very efficiently. A low ratio signifies less efficiency and it may be the result of management or production problems.

4.5 Net Profit Margin (Profitability ratio)

Profitability ratios are financial measures used by stakeholders to calculate the capability of a company to make profit relative to revenue, balance sheet assets, operating costs and shareholders' fund for a year.

One of the profitability ratios is Net Profit Margin. It is used to compute the percentage of profit a company generates from its total income.

A higher net profit margin is desired by companies because it indicates that the company is working well by producing incomes, profits and cash flows.

5. DATA ANALYSIS

Panel Data Analysis is used to study the impact of financial ratios on the annual stock return of 25 pharmaceutical companies in India.

5.1 Model Explanation

Panel data is a multi-dimensional data implying computation over time. Panel data analysis is a statistical method to examine multi-dimensional (normally cross-sectional and longitudinal) panel data. In it data is accumulated over time for the same individuals and for other dimensions. Afterwards a regression analysis is done for these multiple dimensions.

Data analysis is done with the help of Eviews 9.0 software. The descriptive statistics of chosen variables is given in Table 2.

Table 2: Descriptive Statistics of selected variables of the study

	ANNUAL STOCK RETURN	CURRENT RATIO	INVENTORY TURNOVER RATIO	ASSET TURNOVER RATIO	NET PROFIT MARGIN
Mean	33.65	2.18	5.74	73.88	18.61
Median	16.39	1.91	5.64	69.67	14.42
Maximum	305.43	7.11	14.87	201.62	383.37
Minimum	-77.34	0.49	1.45	6.25	-99.99
Std. Dev.	66.27	1.19	2.28	32.89	46.02
Skewness	1.57	1.34	1.47	1.02	6.39
Kurtosis	5.63	5.55	6.29	4.71	49.57
Jarque-Bera	87.07	71.09	101.16	36.98	12145.71
Probability	0.00	0.00	0.00	0.00	0.00
Sum	4206.09	271.92	717.39	9234.92	2326.87
Sum Sq. Dev.	544590.80	175.23	645.88	134114.20	262586.10
Observations	125.00	125.00	125.00	125.00	125.00

Table 2 exhibits the fundamental descriptive features of annual stock return and the independent variables (financial ratios) of the study. Table 2 shows positive mean for all the variables which demonstrates that the down falls are fewer during the period of study. Mean is the highest for Asset Turnover Ratio. The high difference between maximum value of annual stock return 305.43 and the

minimum value of (-77.34) demonstrates that there are a lot of high and low fluctuations of share prices involved during the study period. These high variances are also reflected in the Net Profit Margin maximum value 383.37 and minimum value (-99.99). Annual stock return and Net profit margin also show high standard deviations, which indicates that these companies have taken more risk and faced challenging business conditions during the study period.

For all the variables the skewness and kurtosis is greater than 3 which indicates that all variables are positively skewed and leptokurtic. The probability value of Jarque-Bera test is 0 for all variables which is less than 0.05. Hence, it can be concluded that all variables are not normally distributed.

In Panel Data Analysis the following three approaches can be used:

(a) Pooled Ordinary Least Squares (OLS)

This is the simplest method of estimation with NT observations. In this method,

N= number of individuals or cross-sections, and

T= the number of time periods.

This method is similar to Common Effect Model. It assumes homoscedasticity and no correlation between unit observations in different periods or same period. A sequence of random variables is homoscedastic if all its random variables have the same finite variances.

Table 3 : Pooled Ordinary Least Squares

Variables	Coefficient	Std. Error	t-Statistic	Probability
C	16.49	20.67	0.80	0.43
CURRENT RATIO	-9.28	5.12	-1.81	0.07
INVENTORY TURNOVER RATIO	2.46	2.65	0.93	0.35
ASSET TURNOVER RATIO	0.34	0.18	1.87	0.06
NET PROFIT MARGIN	-0.12	0.13	-0.86	0.39
R-squared	0.08			
Adjusted R-squared	0.04			
F-statistic	2.43			
Prob(F-statistic)	0.05			

The total balanced observations in the analysis are 125.

R-square is the extent of the capability of independent variables simultaneously in describing the dependent variable. The value of R-square is 0.08 that means independent variables can explain 8% of the changes in annual stock return.

When we analyse the probability values of the independent variables in the model, it can be said that the values of all variables are less than 0.5. Hence, the H0 (null hypothesis) is rejected and it can be concluded that financial ratios have an impact on annual stock return.

According to the coefficients it can be interpreted that, current ratio and net profit margin lead to a negative change in annual stock return whereas inventory turnover ratio and asset turnover ratio lead to a positive change in annual stock return.

From Table 3, it can be seen that the t-value of Asset turnover ratio is the highest. So, out of all the variables Asset turnover ratio has more significant impact on annual stock return. The p value of F-statistic i.e., 0.051 is slightly higher than 0.05 indicating a moderately significant model.

(b) Fixed Effect Model

The basic assumption of Fixed Effect Model is that the difference between individuals (cross-sections) can be adjusted from different intercept. This model is different from OLS but still utilizes the ordinary least square principle. The assumption of modelling that produces a constant intercept for each cross-section and time is considered less realistic, so more models are needed to capture the difference.

(c) Random Effect Model

This model is used to analyse panel data where interference variables may be interconnected between time and between individuals. In this model, the difference between intercepts is adjusted by the error terms of each company. The benefit of utilizing Random Effect Model is to remove heteroscedasticity. Here the principle of ordinary least square is not used; rather the principle of maximum likelihood is used.

5.2 Hausman Test

Hausman test assesses the stability of an estimator when compared with a substitute, less effective estimator that is already known to be reliable. It aids one to estimate if a statistical model commensurate to the data.

In the present study, Hausman test is used to find the most suitable type of panel data model between Fixed Effect Model and Random Effect Model. The objective of Hausman test is to find out which method is more appropriate.

H0: Random Effect Model is suitable.

H1: Fixed Effect Model is suitable.

Table 4: Hausman Test

Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Probability
Period random		59.36	4.00	0.00
Cross-section random		8.42	4.00	0.08

In Table 4, the probability for period random is 0 which is less than 5% so Null hypothesis is rejected and Fixed Effect Model is suitable in the present study. The probability for cross-section random is 0.08 which depicts that the value has approached borderline of significance. Hence, Fixed Effect Model is more suitable for the study.

5.3 Results of Fixed Effect Model

Table 5: Fixed Effect Model

Variables	Coefficient	Std. Error	t-Statistic	Probability
C	-38.99	43.46	-0.90	0.37
CURRENT RATIO	-12.59	9.97	-1.26	0.21
INVENTORY TURNOVER RATIO	-1.32	5.66	-0.23	0.82
ASSET TURNOVER RATIO	1.49	0.51	2.91	0.00
NET PROFIT MARGIN	-0.13	0.16	-0.76	0.45
R-squared	0.24			
Adjusted R-squared	0.01			
F-statistic	1.06			
Prob(F-statistic)	0.40			

The value of R-square is 0.24 that means independent variables can explain 24% of the changes in annual stock return.

When we analyse the probability values of the independent variables in the model, it can be said that the values of all variables except inventory turnover ratio are less than 0.5. Hence, the H0 (null hypothesis) is rejected and it can be concluded that atleast one of the financial ratios have an impact on annual stock return.

According to the coefficients it can be interpreted that, current ratio, inventory turnover ratio and net profit margin lead to a negative change in annual stock return whereas asset turnover ratio lead to a positive change in annual stock return.

From Table 3, it can be seen that the t-value of Asset turnover ratio is the highest. So, out of all the variables Asset turnover ratio has more significant impact on annual stock return. The p value of F-statistic i.e., 0.40 is higher than 0.05 indicating a significant model.

6. CONCLUSIONS

The present study is carried out to investigate the impact of financial ratios on annual stock return. For this motive annual stock return is used as a dependent variable whereas current ratio, inventory turnover ratio, asset turnover ratio and net profit margin are taken as independent variables. Hausman test has been utilized to examine which model is suitable to analyse the panel data collected. Based on the same it is found that the Fixed Effect Model is more suitable for the study. The inter-relationship between annual stock return and financial ratios do impact annual stock return. A positive effect has been found in the case of Asset turnover ratio (1.49) whereas current ratio (-12.59) and inventory turnover ratio (-1.32) have a negative effect on annual stock return. The current study concludes that the financial ratios do impact annual stock return. Compared to other ratios, Asset turnover ratio has more significant impact on annual stock return.

REFERENCES

Alexakis Christos, Patra Theophano, Poshakwale Sunil, (August 2010) "Predictability of Stock Returns Using Financial Statement Information: Evidence on Semi-strong Efficiency of Emerging Greek Stock Market", Applied Financial Economics, Vol. 2, No. 16, pp. 1321-1326.

Atmaca Metin, Demirel Engin (2017) "Economic Impact on Financial Ratios of Food Industry at Istanbul Stock Exchange Listed Firms", International Journal of Economics and Financial Issues, Vol. 7, No. 3, pp. 537-541.

Dadrasmoghadam Amir, Akbari Mohammadreza Seyed (May 2015) "Relationship between Financial Ratios in the Stock Prices of Agriculture-Related Companies Accepted on the Stock Exchange of Iran", Research Journal of Fisheries and Hydrobiology, Vol. 10, No. 9, pp. 586-591.

Indian Pharmaceutical Industry, CARE RATINGS – Professional Risk Opinion, [online] Available at: http://www.careratings.com/upload/NewsFiles/SplAnalysis/Report%20on%20Pharma%20sector%20July%202017.pdf [Accessed 22 August 2017]

Jose Cruz, (2018) "Analysis of the Relationship Between Financial Ratios and Net Income Using a Factor and Panel Data Analysis" Economia [online] Available at: http://www.cladea.org/proceeding-2018/pdf/papers/Econom%C3%ADa/CLADEA_2018_paper_309.pdf [Accessed 22 July 2018]

Karaca Serdar Suleyman and Savsar Arif, (2012) "The Effect of Financial Ratios on the Firm Value: Evidence from Turkey", Journal of Applied Economic Sciences, Vol. 7(1), pp. 56-63 [online] Available at: https://www.researchgate.net/publication/288796408_The_effect_of_financial_ratios_on_the_firm_value_Evidence_from_Turkey [Accessed 19 November 2017]

Ministry of Chemicals & Fertilizers, (2017) Annual Report 2016-17, Government of India, [online] Available at: http://pharmaceuticals.gov.in/sites/default/files/Chemical%20Pharma%20-2016-17%20English%20Final%20%20for%20mail%20%282%29.pdf [Accessed 21 August 2017]

Oak Heena, (February 2018) "Analysing Factors Influencing Energy Intensity of Indian Cement Industry", International Journal of Engineering Technologies and Management Research, Vol. 5, No. 2, pp. 213-220.

Pandya Flora, Maind Namdeo Suresh (April 2017) "Panel Data Analysis: Convergence of Indian States with Infrastructure", Journal of Social and Economic Development, Vol. 19, No. 1, pp-181-195.

Rajapaksha R.M.D.S, Yaha D. Roshan (December 2016) "Relationship between Financial Ratios & Share Prices and Prediction of Financial Failure: Evidence from Sri Lanka", International Journal of Scientific & Technology Research, Vol. 5, No. 12, pp. 16-17.

Wijensundera A.A.V.I., Weerasinghe D.A.S., Krishna T.P.C.R., Gunawardena M.M.D. and Peiris H.R.I (2015) "Predictability of Stock Returns Using Financial Ratios: Empirical Evidence from Colombo Stock Exchange", Kelaniya Journal of Management, Vol. 4, No. 2, pp. 44-55.