RELATIONSHIP BETWEEN CASH VS. ACCRUAL BASIS OF ACCOUNTING AND ADVANCED MANUFACTURING TECHNOLOGY IN PHARMACEUTICAL COMPANIES IN MAHARASHTRA (INDIA)

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ABSTRACT

This study was carried out to investigate the relationship between cash and accrual basis of accounting and investment in advanced manufacturing technology in Pharmaceutical Manufacturing Industry in Maharashtra (India). The variables are Net Profit Ratio as an indicator of accounting method used (NPR) in this industry and Research and Development Ratio (R&D Ratio) as an indicator of investment in advanced manufacturing technology. The variables were analyzed using Karle Pearson correlation of coefficient analysis to test whether there is a positive and significant correlation between variables. The result found that, there is not a positive correlation between NPR and R&D Ratio. We compared cash and accrual methods and analyzed difference between two methods in variables under study. The result found that, there is a significant difference between two methods in Net Profit Ratio but there is no significant difference in R&D Ratio between two methods.

Keywords: Accounting, Accrual method, cash method, advanced technology, Research & Development.

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INTRODUCTION

This research tries to identify by the financial accounting systems in State of Maharashtra (India) based on component:

- Justification for investment in advanced manufacturing technology.

Accrual-basis accounting records financial events based on events that change your net worth (the amount owed to you minus the amount you owe others). Standard practice is to record and recognize revenues in the period in which they incur and to match them with related expenses in a process known as matching or expense matching. Even though cash is not received or paid in a credit transaction, they are recorded because they are consequential in the future income and cash flow of the company. Accrual-basis is GAAP compliant.

Cash-basis accounting is a method of bookkeeping that records financial events based on cash flows and cash position. Revenue is recognized when cash is received and expense is recognized when cash is paid. In cash-basis accounting, revenues and expenses are also called cash receipts and cash payments.

OBJECTIVES OF THE STUDY

Researcher by examining and analyzing the financial reports of the Pharmaceutical companies in the State of Maharashtra has taken into consideration the following objectives to examine the mentioned problems and to conclude appropriately.

The main research objectives are summarized as follows

1. Identifying and understanding the methods of financial accounting used in pharmaceutical industry.

2. Identifying and analyzing relationship between the methods of financial accounting used and investment in advanced manufacturing technology.

3. Examining and analyzing difference between accrual and cash methods in various variables.

HYPOTHESIS

Hypothesis1

Accrual method of accounting has positive impact on making decision regarding investment in advanced manufacturing technology.

Hypothesis2

Cash method of accounting has positive impact on making decision regarding investment in advanced manufacturing technology.

RESEARCH METHODOLOGY

For collecting data from firms accepted in Bombay Stock Exchange (BSE).

We put the following conditions:

1- End of periods of these firms should have been at 31 March per years.

2- Firms should not have changed their year-ends.

3- Firms should be in a financial or investing industry.

4- There is a need for availability of data.

Upon above conditions, we select 9 firms and collect their information between 2006-2010.

We collect data from database of Bombay Stock Exchange. Then we analyze these data by SPSS software.

The researcher has used the primary and secondary sources of data for the study as below**:**

 (A) Primary sources:

1) Interview 2) Questionnaires.

 (B) **Secondary sources:**

1) Annual reports of companies 2) Related books and journals 3) Internet.

POPULATION

The population is total of Pharmaceutical Industry in Maharashtra State from 2005- 2006 to 2009-2010. There are 40 Pharmaceutical companies in Maharashtra State

SELECTION OF SAMPLE

The sample size is 9 companies out of 40 companies. Out of 40 Pharmaceutical companies, 9 companies have been selected for study.

DEFINITION OF VARIABLES

Net profit ratio: We derived it from Income Statement of firms. The Net Profit Percentage is the ratio of after-tax profit to net sales.

The formula for the net profit ratio is = (Net profit / Net sales) x 100

 The Net profit ratio (NPR) has been selected as an indicator of accounting method used in this Industry and so as on independent variable.

Research and Development Ratio (R&D Ratio): We derived it from Income Statement of firms. R&D Ratio indicates relationship between Research and Development expenditure and Net Sale and is calculated below:

$$\frac{\text{Research \& Development Exp x 100}}{\text{Net Sale}}$$

Total Research and Development (R&D) Ratio has been selected as a dependent variable and an indicator of investment in advanced manufacturing technology.

ANALYSIS OF HYPOTHESIS

Analysis of hypothesis no.1

For testing hypothesis no.(1), Karle Pearson correlation of coefficient test has been done. According to data obtained in table (1), P-value between NPR and R&D Ratio is 0.186 and this figure is higher than 0.05. So there is not significant correlation between NPR and R&D Ratio at the 0.05 levels.

Table (1): Correlation between NPR and R&D Ratio

		NPR	R&D Ratio
NPR	Pearson Correlation	1	0 .201
	Sig.(2-tailed)	-	0.186
	N	45	45
R&D Ratio	Pearson correlation	0.201	1
	Sig(2-tailed)	0.186	-
	N	45	45

So the null hypothesis is accepted and we can say;

Accrual method of accounting doesn't have positive impact on making decision regarding investment in advanced manufacturing technology.

The table (2) shows the descriptive scales such as means, median, Mode, std. deviation, variance and etc under accrual method on the next page.

Statistics

		NPR	Total R&D Ratio
N	Valid	45	45
	Missing	0	0
Mean		15.7149	4.6313
Median		17.0000	4.9000
Mode		12.00[a]	0.71[a]
Std. Deviation		17.74124	3.28062
Variance		314.752	10.762
Skewness		-1.306	0.553
Std. Error of Skewness		0.354	0.354
Kurtosis		3.929	-0.495
Std. Error of Kurtosis		0.695	0.695
Minimum		-42.45	0.71
Maximum		51.41	12.50

a. Multiple modes exist. The smallest value is shown

The diagrams of two variables NPR and Total R&D Ratio have been indicated under accrual method on the next page.

NPR

Mean =15.71
Std. Dev. =17.741
N =45
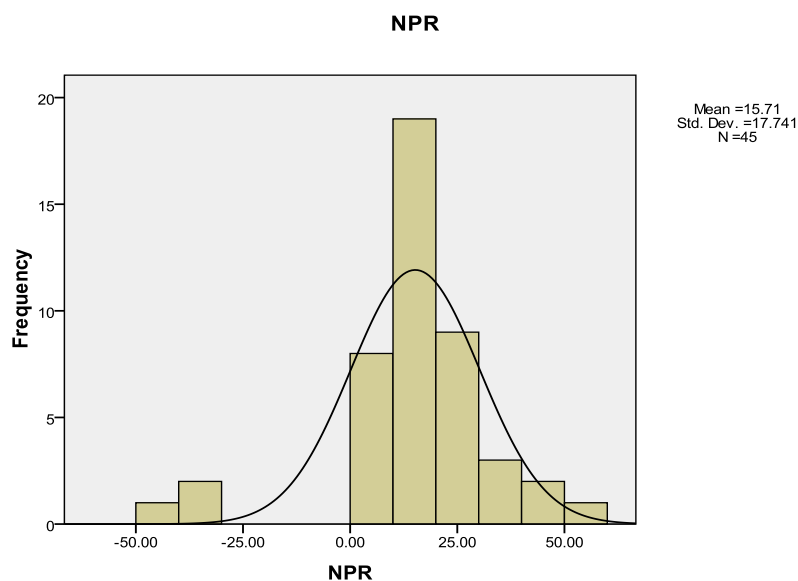
Diagram (1): NPR with normal distribution as per accrual method

R&D Expenditure%

Mean =4.63
Std. Dev. =3.281
N =45
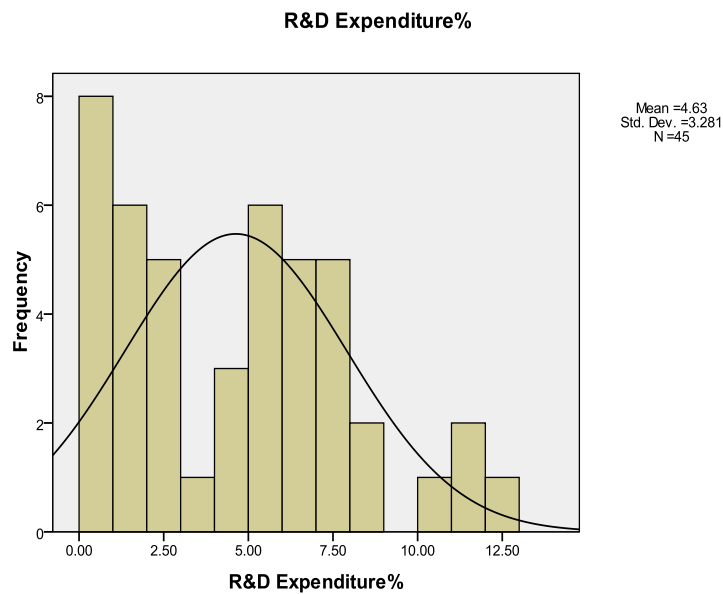
Diagram (2): R&D Ratio with normal distribution as per accrual method

Analysis of hypothesis no.2

According to data obtained in table (3), Pearson correlation and P-value between two variables is -0.54 and 0.724 respectively. P-value between two variables is higher than 0.05.So there is not significant correlation between two variables at the 0.05 levels under cash method.

Table (3): Correlation between NPR and R&D Ratio

		NPR	R&D Ratio
NPR	Pearson correlation Sig.(2-tailed) N	1 45	-0.54 0.724 45
R&D Ratio	Pearson correlation Sig.(2-tailed) N	-0.54 0.724 45	1 45

**So the null hypothesis is accepted** and we can say:

Cash method doesn't have positive impact on decision making regarding investment in advanced manufacturing technology.

The table (4) is showing descriptive scales such as mean, std.deviation, median, mode and rest scales under cash method.

Statistics

	NPR	Total R&D Ratio
N Valid	45	45
Missing	0	0
Mean	12.6942	4.5051
Std. Error of Mean	3.50503	0.52251
Median	12.2000	4.1800
Mode	23.76	0.64
Std. Deviation	23.51246	3.50507
Variance	552.836	12.286
Skewness	-2.154	0.556
Std. Error of Skewness	0.354	0.354
Kurtosis	6.079	-0.903
Std. Error of Kurtosis	0.695	0.695
Minimum	-69.64	0.57
Maximum	49.21	11.64

The following diagrams show the descriptive scales of two variables NPR and R&D Exp Ratio under cash method of accounting.
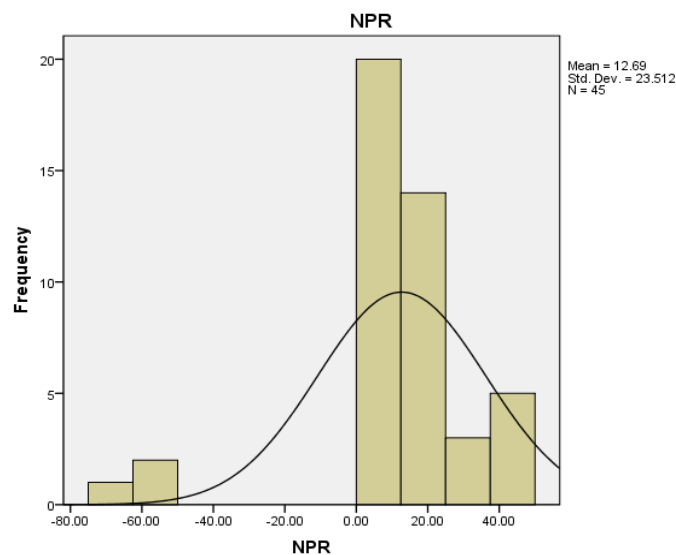
Diagram (3): NPR with normal distribution as per cash method
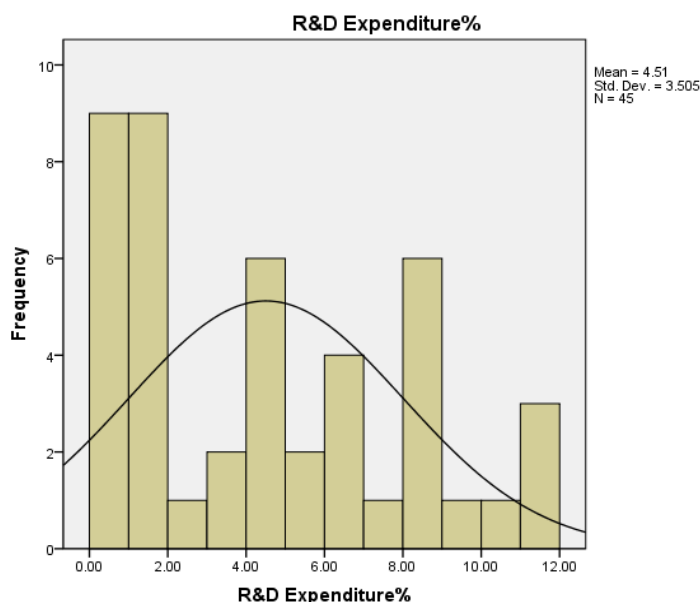
Diagram (4): R&D Exp Ratio with normal distribution as per cash method.

ANALYZING DIFFERENCE BETWEEN ACCRUAL AND CASH METHODS

Table (5) is showing Independent Samples Test in order to examine difference between cash and accrual method in amounts of NPR and Total R&D Exp Ratio.

Table(5):Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
NPR	Equal variances assumed	0.489	0.486	-3.688	88	0.003	-3.0206
R&D Ratio	Equal variances assumed	0.374	0.542	-0.176	88	0.860	-0.1262

In order to analyze difference between accrual and cash methods Independent Samples Test has been used. As per the results obtained in table (5), there is a significant difference between cash and accrual methods at the 0.01 levels in amount of NPR.

Table (6) is showing mean and standard deviation of two variables NPR and R&D Exp Ratio under cash and accrual methods.

Table (6): Mean, Std. Deviation of NPR and R&D Ratio under two method

	method	N	Mean	Std. Deviation	Std. Error Mean
NPR	Cash	45	12.6942	23.51246	3.50503
	Accrual	45	15.7149	17.74124	2.64471
R&D Ratio	Cash	45	4.5051	3.50507	0.52251
	Accrual	45	4.6313	3.28062	0.48905

As per the results obtained in table (6), the Mean of NPR during the five financial years obtained from accrual method in statistical sampling companies is higher than Mean of NPR obtained from cash method. But there is no significant difference between two methods in the amount of R&D Exp Ratio.

Diagrams of different variables among different years under cash and accrual methods have been exhibited on the next pages.
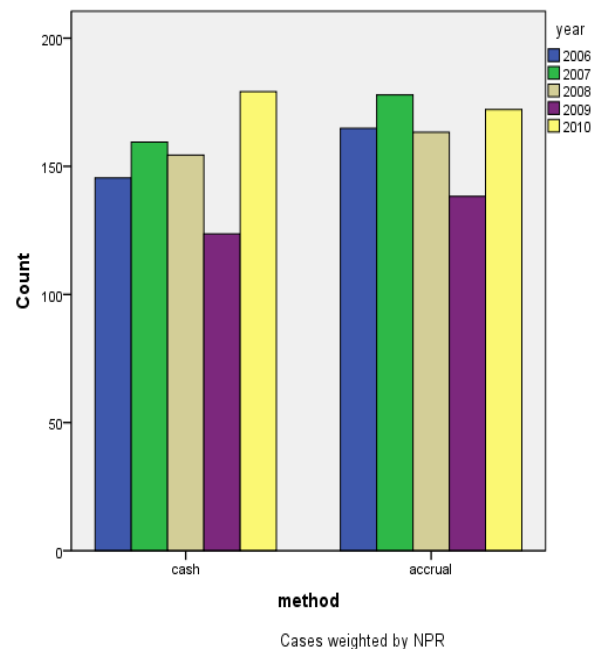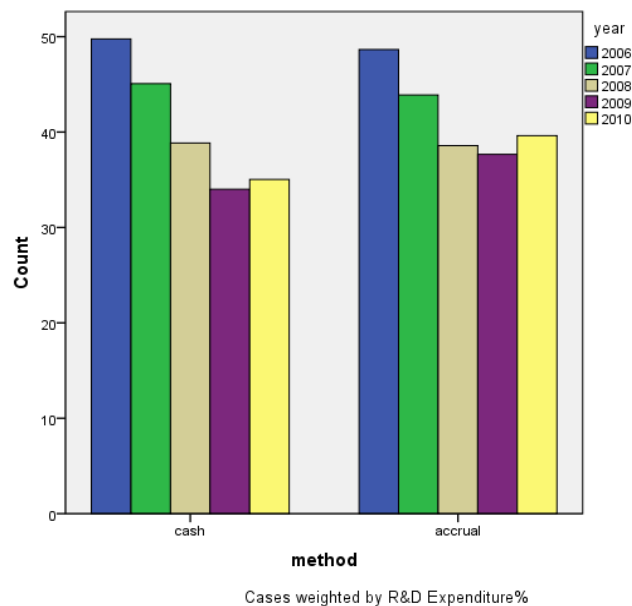
Diagram (5): NPR under cash and accrual method

Diagram (6):R&D Ratio under cash and accrual method

Cases weighted by R&D Expenditure%

CONCLUSION

H1 is rejected. Null hypothesis is accepted.

H2 is rejected. Null hypothesis is accepted.

We analyzed the relationship between cash and accrual basis of accounting and advanced manufacturing technology in Pharmaceutical companies in Maharashtra (India).We investigated that increasing in NPR under cash and accrual methods leads to decreasing in R&D Ratio. As per analysis of data, there is no significant correlation between NPR and R&D Ratio under both of methods. We showed that there is significant difference between cash method and accrual method in the amount of NPR. We showed that there is no significant difference between cash method and accrual method in the amount of R&D Ratio. We also showed the Mean of NPR during the five financial years obtained from accrual method in statistical sampling companies is higher than Mean of NPR obtained from cash method.

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