CHAPTER - SIX

ACCOUNTING STANDARDS ON ACCOUNTING FOR RESEARCH AND DEVELOPMENT ACTIVITIES
Introduction

Research and development costs are incurred by entities for finding out better methods of product, discovering new product line etc. which is necessary for their growth and survival in competitive business environment. Usually all these attempts are not successful. Moreover, this type of cost constitutes a significant part of the gross national expenditure of most of the countries, developed and developing. Research & development are vital for the growth of an economy. In capitalist countries major portion of this cost is incurred by business houses whereas in socialistic and third world countries major portion is borne by government agencies, colleges, universities and other organisations. The existence of great uncertainties about the success of research and developed projects creates problem of capitalising the cost incurred on this head. Consequently, accounting practices on this issue vary widely among entities, industries and nations.

Whether expenditure on research and development should be capitalised or not is debatable. Major questions in the context of accounting treatment of research and development costs are - What should be the accounting treatment of pure research, applied research and development costs ? How the costs of equipments and facilities acquired for a particular R & D project with no alternative future use be treated in accounting ? Should the recovery of R & D costs out of expected future benefits be considered as pre-condition for deferral of development expenditure ? Should the policy of
deferring the development costs, if any, be followed uniformly under similar conditions? What should be the basis for allocation of R & D costs when they are deferred? What are the disclosure requirements of R & D costs in the financial statement? Debate on these issues started long ago and have not yet been settled completely. Academics have expressed their views on these points on different occasions. Academic institutes, professional bodies, large business houses and government agencies have also expressed great interest on this problem. Considering the importance of the topic and with a view to ensuring uniformity in practices, accounting standards on this type of expense have been formulated by various standard setting bodies. This chapter attempts to study, how far the standards are able to minimise the differences and whether there is any scope of their improvement.

For the purpose, the term 'Research and Development' is defined first. Then follows a discussion on the cost elements to be identifiable with research and development. Subsequently a sketch on academic views is presented. How far these views have contributed to the formulation of standards is examined later.

Next follows a comparative analysis of different standards on the issue. After this are examined the proprieties of the standards. With a view to verifying empirically the views on different aspects of accounting for the cost, an empirical study was conducted and the findings of the same
are subsequently presented. The chapter concludes through pointing out some major areas which require further investigation.

**Definition and explanation**

Research activities are conducted for innovating a system or technique to evolve a new production system, or to minimise the cost of production of the existing product or to develop a new product. They attempt to ensure increase in business profitability. So, major objects of such research conducted by entities consist of both expansion of frontiers of knowledge and immediate solving of problem. Research is also conducted to ensure development. Hence, the terms like research, development, discovery, invention do not mean the same, though they are closely interrelated.

The term research implies a close scrutiny of all the available materials on a subject for a new and fresh contribution to knowledge on the subject concerned. It may be in the nature of finding out a new interpretation, meaning or dimension of old subjects in the field of science, technology, social science, statistics, marketing etc.

The term is also used to mean the activities aimed at making a critical analysis of an existing subject or interpreting the same and to have a substantially improved subject or its interpretation. Research activities are conducted for the purpose of development either by means of a fresh contribution or a substantial improvement in the given subject. These
activities are the ways of attaining the aims of development and as such the terms 'Research and Development' are correlated and they cover the whole area of human efforts in general and science and technology in particular. The term research has been defined variously. Some important definitions are discussed below:

According to J.F. Rummel and W.C. Bullaine, research is a careful inquiry or examination to discover new information or relationship or to expand and to verify existing knowledge. It is the "manipulation of things, concepts or symbols for the purpose of generalisation and to extend, correct or verify knowledge, whether that knowledge aids in the construction of a theory or in the practice of an art. The mechanic or physician is a research worker only when he attempts to generalise about all automobiles or all patients in a given class."

This definition is broad based and covers the whole area of human activity. It is not confined only in the field of scientific research. The purpose of research is clear in this definition. Such purpose includes discovery of new information, expansion of existing knowledge, construction of a new theory, improvement in the practice of art etc. It emphasises on generalisation. Ultimate aim of research is growth and development.

In this connection, some important and related terms may be defined as follows:

Research: "Research is the theoretical analysis, explanation, experimentation directed towards the increase of knowledge and thereby the power to control phenomena."

Pure Research: "Pure Research is a search for facts and knowledge without reference to their application." The motivation of this research is scientific curiosity.

Fundamental Research: "Fundamental research is a search for new knowledge in a general field without reference to specific application." The motivation for this search is that any discovery in the general field being explored will probably permit its application by the organisation doing the work.

Applied Research: "Applied research is a search for new knowledge directly applicable to a specific problem and the application of existing knowledge to the practical solution of the problem."

Development: "Development is the extension of the findings and theories of a scientific or technical nature into practical application for experimental or demonstration purpose, including the construction and testing of experimental models or devices."

Discovery: "Discovery is the endeavour to reveal new truths. Causes are ascertained underlying the effects which appear as manifestations of natural phenomena in order to achieve a complete understanding of the working of natural law."

Inventions: "Invention .... aims not at the disclosure but at the practical application of a principle which may be fully or only partly apprehended." The inventor is concerned with immediate ends and normally with limited problems of materials and methods. In effect, he simply directs an experiment to yield a predetermined result.

"The most important part of invention consists in the apprehension of the unawakened need which the invention is to satisfy .... . Invention is not an activity continuously followed, a circumstance which affords a distinction between it and discovery."

From the above definitions it appears that applied research, development, discovery and inventions all are directed to specific problems with the object of immediate solution. Fundamental research has no specific project but any outcome of the research in the general field may be applied by the organisation on a future project. Here, motive of pure research is stated to be only scientific curiosity for which a business concern will not generally be agreed to incur any expenditure.

Research and Development has been defined by the National Science Foundation (NSF), USA as follows:
"Research and Development—Basic and applied research in the science and engineering and the design and development of prototypes and process. This definition excludes quality control, routine product testing, market research, sales promotion, sales service, research in social science and psychology and other nontechnological activities or technical services."  

The National Science Foundation has classified the research and development activities as follows:  

i) Basic Research: Original investigations for the advancement of scientific knowledge not having specific commercial objectives although such investigations may be in fields of present or potential interest to the reporting company.  

ii) Applied Research: Investigations directed to the discovery of new scientific knowledge having specific commercial objectives with respect to product or process. This definition differs from that of basic research chiefly in terms of the objectives of the reporting company.  

iii) Development: Technical activities of a non-routine nature concerned with translating research findings or other scientific knowledge into products or processes. Development does not include routine technical services to customers."

The definition given by NSF is relatively comprehensive and clearly understandable. However, it accommodate

4. Ibid, P. 84.
only the research and development relating to physical and biological science. Non-technological activities or non-technical services have been ignored. This definition does not take into consideration some important aspects like market research, sales promotion, sales service, statistical research etc. But, these aspects are also significant and vital for maintaining the existence and growth of the business enterprise in particular and the economy in general.

Again, difference between basic and applied research is very small. Although unlike applied research, basic research has no well defined commercial objectives, there is no doubt that the outcome of all investigations will ultimately be applied for commercial purposes if there is any such possibility. Commercially viable inventions of basic research will also be used. On the other hand, applied research conducted for specific business objectives may not yield any result. As a matter of fact the outcome of both applied research and basic research are expected to contribute to the overall development of the business concern. Besides, there is a high possibility that basic research will help in the furtherance of applied research. So, NSF definition has rightly interconnected these terms. Exclusion of market research, sales promotion, social science and statistical research does not hamper the importance of the definition as these do not provide any discovery or invention having the effect of
immediate change in technology and product development or evolution of new product. This definition of research and development is considered to be most appropriate in connection with accounting standard on research and development cost.

Today, economic and business environment are most complex and complicated. Large scale production and distribution system covers the major area of economic activities. The channels of distribution are found to spread from local to national and national to international level. Consequently, the investment of huge capital and heavy burden of risk involved. Under this circumstance, it is most important for every business enterprise to have well planned research schemes and fairly elaborate research centres not only for growth but for its very survival.

The terms have also been defined by various standard setting authorities. But, academicians' and standard setters' definitions are not identical. Even the standard setting authorities differ among themselves on this issue. Comparative analysis of these definitions are given later in this chapter. Whatever may be the variations, the academicians and standard setters are agreed on the point that research and development are essential for survival and growth of mankind in these days of uncertainties.

To sumup, R&D cost refers to the expenditure incurred for finding out new means and ways to innovate new technology, new production system or new product for the survival and growth of the entity in particular and the mankind in general.
Activities considered to be research and development

The guidelines to be used for selecting the activities constituting research and development are available from the above definitions. These guidelines are designed to include a wide range of activities in research and development. Variations among different industries or different units of the same industry are so great that a specific prescription of the activities and related costs includable in research and development either for all industries or on industry by industry basis is not a realistic idea.

There are various types of research and development activities. Although a specific list of such activities is not available, still the types of activities constituting research and development may be given as follows:

i) A curious enquiry into basic phenomena to broaden the knowledge base in any field.

ii) An attempt to understand the basic phenomena and directing the enhanced knowledge towards an useful objective.

iii) Creation of method and invention of machinery or tools.

iv) Use of invented methods or tools which are commercially viable and can be profitably used for generation of useful product for the market.
v) Market searching. A company can produce any product if it knows what people want.  

vi) Finding out the alternative methods or products. 

vii) Substantial improvement in product and process. 

viii) Major rectification of the formulation or design of a product or process. 

ix) New methods for presentation, a new interpretation or new process of collection or communication of information. 

x) New tools, jigs, moulds and dies for use of new technology. 

xi) Changing the design of product or process to make it possible to start commercial production. 

xii) Invention of new product and improvement of old product. 

The above list, though not exhaustive, provides just the examples of activities coming under the purview of research and development. A few of these activities are of basic or fundamental research, some are of applied research and the remaining are development activities.

Elements of costs identifiable with research and
development activities

Before considering the accounting treatment of research and development costs it is necessary to identify the elements of costs which, according to the author, constitute research and development. Because of the divergence of opinion and peculiarity of the nature of activities, it is practically very difficult to identify the elements of costs specifically attributable to research and development. Accordingly, ascertaining the exact amount of research and development cost becomes very difficult. Whatever items the list of such cost may contain, it remains inconclusive. So, instead of preparing a list of the elements of research and development cost, it will be wise to provide broad guidelines to identify the elements of costs that should be included in research and development. Identification of the elements of cost attributable to research and development is necessary in order to achieve a reasonable degree of comparability among enterprises and among different accounting periods of the same enterprise. The guidelines to be followed for identifying the elements comprising research and development costs are given below:

i) Expenditures connected with ascertainment of the area of research.

ii) Cost of preparing the project and feasibility report.

iii) Cost of acquiring material and selection, recruitment and replacement of personnel required for research and development.

iv) Cost of materials and services consumed. Such materials and services may be acquired specially for research and development activities or may be supplied from the normal inventory of the enterprise. Unused materials having alternative future use should be excluded.

v) Salaries, wages and other related costs of employees and workers engaged in research and development activities.

vi) Land, Building, Plant, Machinery, Equipments and Facilities: These are capital expenditures incurred for research and development. Such expenses should be capitalised when incurred. A reasonable amount of depreciation on these assets should be charged to research and development cost. Such depreciation may be calculated either on time basis or on use basis, whichever is appropriate to the circumstances. Depreciation on land is generally disallowed. Equipments and facilities having no alternative future economic value should be fully depreciated in the year of purchase.

vii) Hire charge of assets hired for use in research and development activities.
viii) Cost of intangibles like patents, licences etc., to be used for research and development having alternative future use should be capitalised and an appropriate amortization of such intangibles should be included in research and development cost. Full cost of intangibles having no alternative future use and no economic value should be charged to research and development.

ix) A reasonable portion of overhead cost allocated or apportioned to research and development on some suitable basis. Items of indirect costs having no relation to research and development should be excluded.

x) Costs of services performed by outside bodies for the research and development activities of the enterprise should be included at least to the extent of actual payment made to such outside bodies. Similarly, costs of research and development activities performed by the enterprise for outsiders on contract basis should be excluded to the extent such costs are reimbursed to the enterprise.

xi) Costs of registration and preservation of inventions or outcomes of research and development activities.

xii) Costs of further improvement for starting commercial production.

xiii) Costs for maintaining the research and development plan undisturbed.
xiv) Costs for ascertaining the economic viability (including market searching) for commercial use of research and development inventions and discoveries.

xv) Costs (including interest) of capital invested in research and development activities.

Academic views

Over a long period, academicians are expressing their views on what should be proper accounting treatment of research and development costs. Different possible accounting treatments on the same item have been suggested. These expenditures by their very nature, tend to be speculative in character and this creates a serious problem to the accountants in preparing accounting report and herein lies the possibility of alternative treatment of R&D costs. The alternative accounting treatments of R&D costs as suggested by various authorities are given below:

i) According to accrual assumption, it is suggested that R&D costs should be capitalised in the year it is incurred. It should be carried forward and written off against future expected revenue. This is known as deferral method.

ii) According to doctrine of conservatism, it would be better to write off all R&D costs as expense in the year it is incurred. This is known as write off method.

iii) Some body suggested a selective capitalisation method subject to fulfilment of certain conditions with regard to high expectation of future revenue which can be related with

current R&D costs with reasonable degree of certainty.

iv) Another view is that all R&D costs should be accumulated in a special category until the existence of future benefit can be ascertained.

v) There is an opinion that a 'Research and Development Reserve Account' should be created by transferring a certain portion of profit each year. Any R&D expenditure should be written off immediately out of that reserve.

vi) Some accountants transfer all R&D costs to 'Deferred Development Expenditure Account' shown as an asset in the balance sheet. At the same time they create a 'Deferred Development Reserve Account' as an appropriation of profit. They suggested that any portion of deferred development expenditure found to be worth less having no possibility of any future benefit should immediately be written off against 'Deferred Development Reserve Account'.

Below are given the guiding factors to be considered for selecting the best of the alternatives of accounting treatment of research and development costs.

i) Size and type of the company. Whether it is an enterprise having large research and development centre or whether or not it has continuous research and development activities should be identified.

ii) Nature of research and development project as to whether the enterprise conducts research & development

activities on behalf of outsiders on contract basis or whether it give contract of R&D activities to outsiders to be conducted for the enterprise need be examined.

iii) Company's experience and efficiency in budgeting and forecasting techniques. The extent of confidence in predictions about the future benefit must be considered in selecting the accounting method for R&D costs.

iv) The amount by which research and development expenditure vary year to year must be accounted for. In case of substantial fluctuation in cost, write off method can not be suggested. Because, it will then give a dangerously misleading idea about the profitability of the business concern.

v) In order to ensure comparability, it is desirable that all companies in the same industry will adopt same accounting method. So, method of accounting for R&D costs followed by other companies in the same industry should also be considered.

vi) Doctrine of materiality should be given due consideration in examining the alternative methods. Precaution should be taken only when the adoption of alternative method materially affect the reported result of the concern. So, amount of expenditure incurred on R&D is also important.

vii) Business secrecy of the company should be taken into account. If the published accounts disclose a large amount of deferred development expenditure then competitors
will get indication about the future plan of the company and they will be careful about the possibility of new product appearing in the market.

viii) Necessity of window dressing in the balance sheet to secure the confidence of shareholders, investors and suppliers should be duly considered. Deferral method will represent a healthy looking balance sheet and will disclose a stronger net asset position.

ix) Degree of certainty about the future flow of benefits and possibility of its measurement should be noted.

x) Possibility of establishing relationship between R&D cost and future expected benefit need to be examined.

xi) What criteria are to be fulfilled by R&D costs to be treated as asset must be identified.

xii) What criteria are to be fulfilled by R&D costs to be treated as expense should also be taken into account.

Are R&D costs assets?

Answer to the question require enumeration of what is meant by an asset and examining whether requisite conditions are met here.

Assets of an entity refer to what it is entitled to get. According to American Accounting Association, "assets are economic resources devoted to business purposes within a

specific entity, they are aggregate of service potentials available for or beneficial to expected operation."\textsuperscript{10} So, the entity acquired an asset for getting future service. Accordingly, if some realisable claims for services occurred due to cost incurred then such cost can be capitalised. The term economic resource refers to "the scarce means for carrying on economic activities." "The economic resources of a particular enterprise are generally regarded as those scarce resources for which there is an expectation of future benefits to the enterprise either through use or sale."\textsuperscript{11}

But, for financial accounting purpose all economic resources cannot be recognised as asset. The criteria to be fulfilled for accounting recognition of economic resources as assets are given below:

a) There must be an expectation of future benefits to the enterprise out of the economic resources.

b) Economic resource will be called asset only when the future expected benefits can be identified and objectively measured at the time the resource is acquired or developed.\textsuperscript{12}

c) It must be possible to relate the current costs of economic resource with future benefits.

d) The future expected benefits from economic resources must be considered realisable with high degree of certainty.

\textsuperscript{10} Ibid, P. 116.


\textsuperscript{12} Ibid, P. 86.
e) Such future benefits should be exchangeable against money or money’s worth. Exchangeability should be considered at the time of accounting recognition of asset.\textsuperscript{13}

At the time of incurring most of the research and development expenditures, future benefits are at best uncertain. So, they can not be measured objectively and it is very difficult to identify future expected benefits. Moreover, uncertain future benefits are not exchangeable. There is little, if any, possibility of establishing a relationship between current R&D costs and future flow of benefits. So, none of the tests suggested above is satisfied by R&D costs at the time it is incurred to make them assets.

**Recognition of cost as expense**

Now let us examine, whether R&D costs are to be treated as expenses. For the purpose, we are to examine first what is meant by expense. The term expense denote expired cost, benefits from which do not extend beyond the present.\textsuperscript{14} "Expired cost refers to that portion of original outlay cost, benefits available in exchange of which expire as an accounting period ends, whether they are consumed or not."\textsuperscript{15} Thus, consumption of benefit is not warranted everywhere.

Matching theory is also considered to be an important criterion for expense recognition. But, the term matching has a

\begin{itemize}
  \item \textsuperscript{13} Ibid, P.85.
  \item \textsuperscript{14} E.L.Kohler, A Dictionary for Accountants, Prentice Hall of India Pvt.Ltd., New Delhi-110001, 1979, P.201.
  \item \textsuperscript{15} Dr.G.C.Sinha, Accounting Theory, Book World, Calcutta-9, India, 1986, P.94.
\end{itemize}
wide variety of meaning in accounting literature. Matching refers to identifying, measuring and relating revenues and expenses of an enterprise for an accounting period as pointed out in paragraph 147 of APB statement no.4. So, matching concept need not necessarily be applied in recognising an item of expense.

If costs and revenues can be identified in the relationship of cause and effect then also the costs can be charged as expenses. According to the cause and effect criterion, if costs can be identified in direct association with specific revenues then such costs can be treated as expense. Costs can also be recognised as expense by way of systematic and scientific allocation over a period of time. Some costs are recognised as expense as they occur on the grounds that:

a) such costs do not indicate any measurable future benefits;

b) future benefits, if any, expected from the costs can not be related with such costs;

c) allocation of costs over a period of time serves no useful purpose; and

(d) costs carried forward as assets in prior periods that are discovered to have no future flow of identifiable benefit which is known as immediate recognition principle.  


17. Ibid, P.86.
Research and Development costs can not be treated expired as its benefits may extend beyond the present period, what ever little and uncertain such possibility may be. Matching theory in its simple sense is not helpful in considering R&D costs an expense. For a given period of time there is no cause and effect relationship between R&D costs & revenue. R&D costs satisfy some of the conditions for immediate recognition principle for identifying costs as expenses.

Research and Development (R&D) costs vs. Repairs and Maintenance (R&M) costs

These costs are not identical and they vary as to their nature and composition. Both the categories contain capital and revenue expenditures. Elements of revenue expenditure for both R&D and R&M costs are similar. The proportion of capital expenditure on R&D costs may be higher than that of R&M costs. Still, R&M costs include some capital items like maintenance of building, equipments etc. Both of them are controllable to a large extent. The management can control them and amount of expenditure on these heads are discretionary. However, such discretionsof management are more applicable for R&D costs than R&M costs.

Despite these similarities, there are some differences between the two regarding the accounting treatment. R&M costs are generally shown in one sub heading in the profit and loss account but no such treatment about R&D costs is found. Components of R&D and R&M costs are almost similar. R&M costs always
find an independent & separate place in profit and loss account. So, question may arise as to why R&D costs do not get such accounting treatment. Under certain circumstances, it is found that R&D capital items are shown in balance sheet but R&M capital items, if any, are never shown as separate item in the balance sheet.  

It is interesting to consider the composition of R&M costs. It includes materials, wages & salaries, equipments etc. each of which are shown under separate sub head in the profit and loss account. For example, if salaries & wages are shown as a separate item then one will safely assume that it includes the salaries & wages of maintenance gang also. So, question may arise about the constituents of R&M costs. A reasonable explanation in this respect is necessary which is suggested by Dr.S.K.Chakraborty in the following lines for R&M costs:

"a) Wages and salaries (after adjustment from the total cost to the enterprise for this head).

b) Stores used (after adjustment from the total cost to the enterprise for this heard)." 

He also suggested the same breakup for R&D costs. He goes on to say that "Spares used for maintaining R&D equipment should be separated out from spares used for production equipment." Such separate treatment for all the elements of costs

18. Dr.S.K.Chakraborty and B.K.Bhoumik, Management and Accounting for Research and Development - The Indian Prax's, The Institute of Cost and Works Accountants of India, 12 Sudder Street, Calcutta-700016,India,1984, P.64.


comprising R&D appears to be fair as because R&D activities of an enterprise are quite distinct from its on going productive operation.

Position in India

In India, reference to R&D expenditure is given mainly in Director's and Chairman's speech with varying degree of openness. Such variation in disclosure of R&D data are found irrespective of variables like size & type of business, product mix, ownership etc. There is very little, if any, in Indian practice to disclose R&D data in profit and loss account and balance sheet.

A comparatively elaborate disclosure of R&D costs was found in annual account of Sudarshan Chemicals Industries Ltd. (SCI), a private sector Indian firm in the year of 1978-79. In this firm all revenue expenditures of R&D are separately booked and charged to profit and loss account and capitalised R&D costs are shown in balance sheet. The accounting policy statement on R&D costs of Bharat Heavy Electricals Ltd.(BHEL), a major public sector Indian firm contains as follows:

"Research and development expenditure is charged to profit and loss account in the year of incurrence. However, R&D expenditure on fixed assets (except those which are charged from customers), costing over ₹10,000 each is treated in the same way as other fixed assets of the company." 22

21. Dr.S.K.Chakraborty and B.K.Bhoumik, Management and Accounting for Research and Development - The Indian Praxis, The Institute of Cost and Works Accountants of India, 12 Sudder Street, Calcutta-700016, India, 1984, PP.70,72, 75 and 77-81.

22. Ibid, P.75.
The annual account of Bharat Earth Movers Ltd. (BEML), a public enterprise in the year of 1976-77 show a "R&D Reserve account" as per the previous balance sheet. Its accounting policy stated as follows:

"The expenditure on R&D is charged to profit and loss account in the year of incurrence. Expenditure on fixed assets relating to R&D are capitalised."

Thus, it is clear that up to the year of 1975-76, BEML created R&D Reserve account out of profit so that any revenue expenditure on R&D could be charged against this reserve. However, this practice was not followed subsequently. Here, all fixed assets, irrespective of cost ceiling of ₹10,000 each, (unlike BHEL) are capitalised.

The Electronic Corporation of India Ltd. (ECIL) disclosed the accounting policy for R&D as follows:

"The expenditure (R&D) is charged to profit and loss account in the year of incurrence."

It seems that capital expenditures on R&D are also charged here to profit and loss account.

Deferred revenue expenditure treatment of R&D costs was found in two public sector companies—Scooters India Ltd. (SIL) and Hindustan Fertilisers Corporation Ltd. (HFL). The former's annual report for 1979-80 contains two accounting policy statement as follows:

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23. Ibid, P.77.
24. Ibid, P.79.
7. Expense and overhead relating to development projects, the benefits whereof are to be reaped in future years, are allocated to the Deferred Revenue Expenditure account, except as indicated in policy no. 8.

8. R&D expenses are charged off in the year of incurrence except as indicated in policy No.7."25

Similarly, the balance sheet of HFL for 1980-81 contained an item "Development expenditure", a sort of deferred revenue expenditure treatment of R&D costs. It is interesting to note that both SIL and HFL are losing concern and it is apparent that deferred revenue expenditure treatment was made in order to reduce the reported loss as far as possible.

According to Company Act, 1956 (Schedule VI) any single item of expense of $5,000 or 1% of total revenue whichever is higher must be shown distinctly and separately as such. Empirical study suggests that most concerns do not incur R&D cost of more than 1% of total revenue. Again, if it exceeds the 1% limit then also various ingredients of R&D costs can be covered by the normal expense heads like salaries, stores etc. So, in fact there is no legal compulsion about the disclosure of R&D costs.

The finance director of a rapidly growing private sector company contends that the shareholders should be told

about R&D expenses through accounting report. But, chief cost accounts officer of the government of India disallowed R&D cost for pricing purpose contending that it is not a revenue cost item. On the other hand, commercial director of a large multinational firm defended non-disclosure by arguing that such knowledge of R&D costs will not help decision model of various users of accounting statement.26

So, two basic accounting instruments namely, profit and loss account and balance sheet, for communicating information to users, have rarely been used in India for accounting treatment of R&D costs. Some references of high and imaginative prospects of future R&D plan are found in directors and chairman's report. Although, some disclosure of R&D costs are found in profit and loss account and balance sheet of some concerns, they lack clarity and consistency. Large public and private sector concerns like Indian Drugs and Pharmaceuticals Ltd., Indian Petrochemicals Corporation Ltd., Associated Cement Companies Ltd. etc. did not disclose anything about R&D costs in their published accounts inspite of the fact that each of these enterprises has elaborate R&D centres. However, in India revenue expenditures on R&D are charged as expenses and fixed assets acquired for the purpose are capitalised and depreciated like other fixed assets.

Arguments for and against different accounting methods for R&D costs

Now, we shall discuss the main arguments, for and against the practice of any particular method for accounting

treatment of R&D costs. The following factors may be considered suitable for supporting the deferral method:

a) From the point of view of accrual concept, deferral method appears more realistic. Research and development activities are undertaken with the expectation of future benefit. If there were no such expectations either in the short run or in the long run, the enterprise would not have undertaken such activities.

b) R&D costs are not incurred as overhead expenses necessary for current production and hence it is commercially desirable to capitalise such costs.

c) Although future benefits of current R&D costs are most uncertain, if one considers all the R&D projects of an enterprise together then such uncertainty will be removed or reduced to a large extent. So, if there is a high probability of realising future benefits from the company's total R&D activities, all costs relating to such activities should be capitalised disregarding the certainty of future benefits from individual project.

d) Deferral method will ensure the consistency and reliability of reported profit of the company. A write off method artificially reduces or raises the profit of the company giving a dangerously misleading idea about the profitability of the business.
e) Under deferral method R&D costs are not charged against current revenue and for that reason management will not be discouraged to increase investment in R&D activities which is socially desirable and commercially wise for ensuring long term growth of the enterprise.

The reasons forwarded for not introducing deferral method are given below:

a) Deferral method is not generally followed by business firms and accountants due to prudence concept.

b) Criteria used for recognising an item as an asset are not met in case of R&D costs.

c) Future benefits of current R&D costs are at best uncertain and unmeasurable.

d) It is not possible to establish any meaningful relationship between future benefits and current R&D costs.

e) It is not appropriate to consider accounting treatment of R&D costs on enterprise wise basis i.e. all the R&D activities should not be considered on aggregate basis. Because, expectation of future benefits can be objectively evaluated only in relation to individual or related transaction or project.

f) If there are several R&D projects of an enterprise at different stages of completion with varying degree of uncertainty then the period of future benefits could not be determined with reference to aggregate R&D activities. So,
a meaningful method of amortization could not be developed if R&D costs are capitalised on enterprise wise basis.

The main arguments used to support the writeoff method are as follows:

a) Immediate recognition principle of identifying cost as expense is satisfied by R&D costs as discussed earlier.

b) Doctrine of conservatism is reflected in writeoff method which is accepted by majority of accountants.

c) Outflow of fund for R&D costs is not definitely realised in current period. So, profit determined by writeoff method is a proper indication of fund available for dividend.

d) Writeoff method is quite straightforward. Unlike deferral method it does not involve exercise of subjective judgement regarding future revenue.

e) It is practically difficult and almost impossible to relate R&D costs to specific future income.

f) When management take decision of R&D project, they are well informed about the uncertainty of its success. So, they take the decision on the idea that such R&D costs will be recovered out of current revenue and hence writeoff method is justified.

g) Writeoff method generally does not give a misleading idea about the companies profitability. Future benefits of R&D costs are so uncertain that capitalisation
of the same will in no way be helpful to increase one's ability to assess or predict the return on investment and the variability of that return.

The arguments against the writeoff method are:

a) Under writeoff method profit of the business enterprise is not fairly ascertained. Profit of an enterprise is determined by setting against the income earned, the cost of earning it. But, it is argued that R&D costs are not required to earn current income.

b) Under certain circumstances and atleast for some R&D projects it may be possible to foresee the possible future benefit and in that case writeoff method is absolutely undesirable.

c) Writeoff method will discourage the management for investment in R&D activities.

**Selective capitalisation method - its merits & demerits**

This method calls for separate and distinct accounting treatment of some R&D costs than the others. Here, only those R&D costs are capitalised which satisfy certain specific conditions. All other R&D costs are written off. Conditions to be satisfied for capitalisation of R&D costs can briefly be summarised as follows:

i) The probable new or improved product or process must be well defined.
ii) The cost attributable to R&D project must be separately identified.

iii) Technological feasibility of the new or improved product or process should be assessed up to reasonable certainty.

iv) Market demand or possibility of internal use of the new product or process must be substantially assured.

v) Only those R&D costs which can be sufficiently recovered out of the future economic benefits can be capitalised. This requires the measurability of future benefits.

vi) Management should decide finally to translate the research findings into new or improved product or process.

vii) Where interperiod comparison of net income will be materially affected due to immediate charging of R&D costs to expenses then such R&D costs will be capitalised.

viii) Financial viability of the project must be high. That is, adequate supply of capital for completion of the project should be assured.

Practically, it is very difficult to satisfy the above conditions so that at least some selected items of R&D costs can be capitalised. Again, criteria for selection of such R&D costs do not indicate the fixed and variable nature of the cost. Even if some R&D projects satisfy the conditions laid down, this will take place only at the midway. So, the previously incurred costs which were written off may
need be written back and capitalised. This is against the present accounting practice and many other such problems may arise due to selective capitalisation.

Still, the method of selective capitalisation stands by its own merits. It is not impossible to satisfy the conditions in certain cases. Moreover, this method attracts more judgement and assessment regarding the R&D project.

Creation of separate category of R&D costs - its usefulness

Accumulation of all R&D costs in a special category also has its merits and demerits. According to this method accumulated costs will be capitalised if future benefit is reasonably established, otherwise it will be written off as expense. It is argued that this method draws attention to uncertainty surrounding most R&D costs. This method also remove the conflict between deferral and writeoff method.

But, it may be pointed out that costs accumulated in a special category would not be useful in assessing the earning capacity of the business. On the contrary, it may alter the basic nature of financial statement and create unnecessary complications.

Impact of academic discourse on standard setting

Due to the above divergence of opinions about the accounting treatment of R&D costs, different standard setters in and outside the country have come forward to formulate accounting standard on accounting for research and development
costs. Necessity of setting standard on this topic was felt due to the idea gained from academician's discussion on the matter. So, base of accounting standard on R&D costs is the views expressed by different authors on different occasions. The standard setters have made an elaborate and critical analysis of these views. In addition, they have consulted different professional bodies, accounting practitioners and also conducted public hearing. So, academic views provided the ground on which standards are formulated. In fact, standards are the process of concretisation of these views.

Academic discussions are mainly theoretical. Here all the possible accounting treatment of R&D costs are indicated and such possibilities are found out from the theoretical point of view. During the process of standard setting, all these possibilities were evaluated and quite naturally it has not been possible to incorporate all the ideas in the standard. However, academician's views have contributed to a large extent in the standard setting. Accounting standards are some kind of refinement of the academic discussions.

Again, accounting standards on R&D costs formulated by various standard setting bodies are not similar. Some of the standards recommended varying accounting treatment of R&D costs on a specific circumstance; while others followed more rigidity by recommending only one - the best accounting treatment for R&D costs, leaving no scope for professional judgement of accountants. Now, a brief comparative analysis of accounting standards on accounting for R&D costs formulated by some renowned standard setting agencies may be presented.
Statement of similarities and differences among Accounting Standards on Accounting for Research and Development Activities formulated by some renowned standard setting authorities and the related academic views on the issue

<table>
<thead>
<tr>
<th>Components of R&amp;D costs</th>
<th>INTERNATIONAL IAS-97</th>
<th>INDIA AS-828</th>
<th>UK SSAP-1329</th>
<th>USA FAS - 230</th>
<th>Academic Views</th>
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<tr>
<td>1. Research and develop-</td>
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<td>1. Elements of cost shall</td>
<td>1. Volumes of work performed by academicians regarding the way of identification of R&amp;D costs are available. From the different academic views on this point we see that they suggested to include the following types of expenses in R&amp;D costs: a) Salaries, wages and other related manpower costs incurred for conducting research and development activities.</td>
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<td>ment costs should include:</td>
<td>ment costs should include:</td>
<td>be identified with research and development activities as follows: a) Materials, equipments and facilities: The costs of the materials and equipments or facilities that are acquired or constructed for research and development activities and that have alternative future use shall be capitalised as tangible assets when acquired or constructed. The costs of such materials consumed in R&amp;D activities and the depreciation of such equipments or facilities used in those activities.</td>
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<td>a) the salaries, wages and other related costs of personnel engaged in research and development activities;</td>
<td>i) salaries, wages and other related costs of personnel engaged in research and development;</td>
<td>it does not provide any guidelines for determining the elements of cost identifiable with R&amp;D activities. Also, it does not contain any comprehensive list of expense items which will be included in research and development costs. However, it defines pure research, applied research and explains what development means. It states that</td>
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<td>b) the costs of materials and services consumed in research and development activities;</td>
<td>ii) costs of materials and services consumed in research and development;</td>
<td>ii) depreciation of building, equipment and facilities which have alternative economic use, to the extent that they are used for research and development;</td>
<td>iv) an appropriate amortization of the costs of building, equipment and</td>
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<td>c) the depreciation of equipment and facilities to the extent that they are used for research and development activities;</td>
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<td>d) overhead costs related to research and development activities;</td>
<td>iv) an appropriate amortization of the costs of building, equipment and</td>
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<td>development activities; and</td>
<td>depreciation on fixed assets used for R&amp;D costs. However, the amount of depreciation that will be included in total depreciation charge disclosed in accordance with the Companies Act and will also form part of total R&amp;D expenditure disclosed. If the company conducts any R&amp;D activities on behalf of third parties on the condition that all related costs will be reimbursed then any such expenditure not re-imbursed at the balance sheet date should be included in work in progress. Thus, it gives some indications about the constituent of R&amp;D costs.</td>
<td>are research and development costs. However, the cost of materials, equipment or facilities that are acquired or constructed for a particular research &amp; development project and that have no alternative future use should be included in R&amp;D costs in the year of incurring the expense.</td>
<td>c) Intangibles purchased for use in R&amp;D costs are generally capitalised and amortized on some suitable basis. Appropriate amortized portion of intangibles also comprises R&amp;D costs. However, if any intangible is not capitalised, its full cost should be included in R&amp;D costs.</td>
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<td>e) other costs related to research and development activities, such as the amortization of patents and licences.</td>
<td>h) Overhead costs related to R&amp;D;</td>
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<tr>
<td>FAS-2 regarding capitalisation and amortization of equipments and facilities that have no alternative economic use.</td>
<td>v) Amortization of patents and licences.</td>
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<td>This standard does not take into consideration the alternative future economic use of equipments and facilities used in R&amp;D activities.</td>
<td>i) Intangibles: The cost of intangibles that are purchased from others for use in R&amp;D activities and that have alternative future uses shall be capitalised and amortized. This amortization of intangibles is R&amp;D cost. However, cost of intangibles purchased for a particular R&amp;D project and that have no alternative future uses and therefore no separate economic values are R&amp;D</td>
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<td>Similarly, it does not consider the alternative economic use of patents, licences and other intangibles at the time of amortization. IAS-9 also remains silent about the cost of services performed by others.</td>
<td>j) Any kind of overhead expenses related to research and development activities are treated as R&amp;D costs.</td>
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<td>After giving a proper thought, FAS concluded that equipments, facilities and intangibles are research and development costs. However, the cost of materials, equipment or facilities that are acquired or constructed for a particular research &amp; development project and that have no alternative future use should be included in R&amp;D costs in the year of incurring the expense.</td>
<td>e) Payment to outside bodies for conducting research and development activities on contract basis for the enterprise is also a constituent of R&amp;D costs.</td>
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2. The amount of research costs at the time the costs are incurred.
c) Contract service: The cost of services performed by others in connection with the R&D activities of an enterprise including R&D conducted by others on behalf of the enterprise shall be included in R&D costs.
d) Indirect cost: R&D costs shall include a reasonable allocation of indirect costs. However, general & administrative costs that are not clearly related to R&D activities shall not be included in research and development costs.

Above list of expenses identifiable with research and development activities are gathered from the academic views expressed by different authors on various occasions. As regards the composition of R&D costs we see that recommendations of the accounting standards are in agreement with the academic views.

Treatment of R&D costs

2. The amount of research and development costs should be charged as an expense of the period.
2. All expenditures on pure and applied research should be written off in the year in which it is incurred.
2. The only directive of this standard is that all research and development costs as identified, expressed their views on
expense of the period in which they are incurred except under certain circumstances. Development expenditure shall also be written off in the year it is incurred expect that it may be deferred to future periods subject to certain conditions. However, the R&D projects sponsored by government R&D project, are likely to be more risky than the industrial R&D project.  


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<th>CONDITIONS FOR DEFERRING DEVELOPMENT COSTS</th>
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<td>3. IAS-9 requires that all the following conditions must be satisfied for deferral treatment of any development costs of a project may be deferred to future periods if the following criteria are satisfied: a) the product or process is clearly defined and the costs attributable to the product or process can be separately identified; b) the technical feasibility of the product or process has been demonstrated; c) the management of the enterprise has indicated its intention to produce and market or use the product or process; d) there is a reasonable indication that current</td>
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<td>3. According to this standard, research and development expenditure can be deferred to future periods on the following conditions: a) That there is a clearly defined project. b) That expenditure on the project can be separately identified. c) That the outcome of the project has been assessed with reasonable certainty as to: i) technical feasibility; and ii) commercial viability, with special reference to likely market conditions, public opinion and consumer &amp; environmental legislation. d) That the total of</td>
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<td>3. The accounting standard lays down that development expenditure can</td>
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<td>3. American standard does not permit deferral of any research and development costs. Here also standard setters gave sufficient thought on the issue of deferral of R&amp;D costs. But, they concluded that criteria to be fulfilled for such treatment of R&amp;D costs are almost impossible to be identified as satisfied and hence deferral is not permissible. This recommendation is found to be similar as to the rigidity and requirements with the accounting standards. Like the standards, academicians also opined that for deferral treatment of R&amp;D costs, there must be a clearly defined project, cost of the project should be separately identifiable, technical feasibility</td>
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<td>3. Conventional accounting practice generally does not prefer the deferral treatment of R&amp;D costs. Academicians have suggested that R&amp;D costs can be deferred subject to fulfillment of some conditions. These are found to be similar as to the rigidity and requirements with the accounting standards. Whereas,</td>
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<td>d) there is a clear indication of a future market for the product or process, if it is to be used internally rather than sold, its usefulness to the enterprise can be demonstrated; and adequate resources are reasonably expected to be available, to complete the project and market the product or process.</td>
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So, justification of the recommendation of American standard for writing off all the R&D costs should be established by more logical arguments if it is to be. English Standard cover all the conditions imposed by International and Indian standards for deferral of development costs. Here, deferral is permitted only to the extent that recovery of the expenditure can reasonably be regarded as assured and the criteria used must be applied consistently and continuously.
5. It is the established accounting theory accepted by the academicians in general that any expenditure which is deferred and capitalised should be allocated on some suitable basis systematically to the future accounting periods. The same theory is also applicable for R&D costs. Here, sale or use of the product or process or to the time period over which the product or process is expected to be sold or used.

### Basis of allocation

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Review of deferred development costs

6. The deferred research and development costs of a project should be reviewed at the end of each accounting period. When the criteria for deferral of the costs no longer apply, the unamortized balance should be charged as an expense immediately. When the criteria for deferral continue to be met but the amount of the unamortized balance of the deferred R&D costs and other relevant costs that can reasonably be expected to be recovered from related future revenues is exceeded by the unamortized balance of such costs, the excess should be charged as an expense immediately.

6. SSAP-13 provides that deferred development expenditure should be reviewed at the end of each accounting period. Where any of the conditions for deferral no longer exist, the expenditure must be written off immediately. If any portion of the deferred development expenditure is found to be irrecoverable, that portion should be charged as expenses.

6. The issue of writing-off or writting-down of the unamortised portion of deferred R&D costs in the subsequent years is not relevant in FAS-2 as it did not permit the deferral treatment. So, question of reviewing the deferred development costs does not arise.

6. It is obvious that unamortised deferred R&D costs if any should be reviewed periodically. If the conditions for deferral of the amount no longer exist either fully or partly then the entire amount or part thereof should be written off immediately. Such is the view generally expressed by academicians. So, accounting standards and academicians are not widely different on this issue.
7. Development costs once written off should not be reinstated even though the uncertainties which had led to their being written off no longer exist. This recommendation is in sharp variation with revised SSAP-13.

7. Originally the English standard recommended that once development expenditure has been written off it must not be re-instated, even if, in the light of new knowledge or information, it can confidently be expected to be recovered. But, effective from 1st January 1989, there is no longer such a provision in revised SSAP-13. It would appear that re-instatement of previously written off R&D expenditure can now be justified. This is a significant departure from International and Indian standards.

Disclosure

8.1) The total of research and development costs including amortisation of deferred expenditure shall be made in the financial statements of the company. No specific disclosure is required regarding the reinstatement of previously written off R&D expenditure.

7. Although no specific academic view is available regarding the reinstatement of R&D costs which was previously written off, from the conservatism point of view it can be said that once R&D costs is written off it will not be a sound accounting policy to write it back even if in the altered circumstances it can be confidently expected that R&D costs will be sufficiently recovered out of future related benefits. However, the issue is still debatable.

Academic Views

USA

UK

India

Although academic views are not specific, it is generally accepted that once R&D costs are written off, they should not be reinstated even if new knowledge or information suggests otherwise.
that all the information required for true and fair view of financial statement must be disclosed. They stressed the need for adequate, full and fair disclosure depending upon the circumstances. The same views are also applicable for disclosure requirement of R&D costs. Hence, the recommendations of the accounting standards regarding disclosure of R&D costs are covered by the academic views on the issue.

Propriety of the standards and scope for further improvement

Propriety of accounting standards on accounting for research and development depends upon, how far they are successful in solving accounting problems under consideration, confronting the accountants. Accountants are divided about the proper accounting treatment of R&D costs. Unlike other items, there is no settled accounting principle for R&D costs. In fact, studies in accounting for R&D costs reveal that in most cases R&D costs has not been identified as a financial activity to be disclosed in financial accounting as a separate item. Business houses with fairly elaborate R&D centres had at best referred the matter only in Director's report or Chairman's speech. In some cases R&D costs are shown in the formal financial statements (i.e. revenue statement and balance sheet), though consistency is not followed in the method of disclosure. Some entities discontinued to disclose the item in the accounting statement after following the principle for some years. Some enterprises started afresh to include the R&D costs in accounting report. On this issue opinions of the academicians, professionals and executives also, as evident from the empirical study, vary widely.

Academicians have long been criticising this practice. They have expressed their diversified views about the accounting treatment of R&D costs. Public voice was also raised against the practice of keeping R&D expenditure under veil. Such a situation was found in 1971 with the financial collapse of the Rolls Royce
group; the balance sheet of the group included a large deferred development expenditure in respect of a project which could not be completed profitably. Investors and creditors frequently become confused when they do not see any item of R&D expenditure in the accounting statement inspite of their knowledge about the existence of R&D centres of the enterprise. Even if R&D costs are disclosed, they are not well informed about the circumstances under which it was capitalised or written off, as the case may be.

Accounting standards on accounting for R&D costs emerge after taking into consideration all the above points. So, propriety should be evaluated giving due regard to, how far the standards have served the purpose of different parties. From the academician's point of view, it can be said that, standard setters have given much mind upon every academic suggestion and suggested the best course of action to be followed for R&D costs (vide comparative statement, page nos. 218-228). Directives of the standards in this respect are basically the outcome of the consolidation of various academic suggestions. Public grievances can be reduced greatly if standards, formulated by professional and autonomous bodies having no personal interest in any enterprise, are followed. Investors and creditors will be satisfied and will find it helpful for judgement, valuation and decision making if they know that R&D cost was treated in accounting according to accounting standard. Thus, it can be claimed that accounting standards on accounting for R&D costs are proper as they, it is expected, will serve the purpose for which these are formulated.

36. J. Blake, OP. cit., P.117.
But, standards formulated by different authorities on this matter are not similar. FAS-2 has suggested only one treatment (i.e. the expenditure is to be written off in full). But, IAS and SSAP provided scope for choosing any of the deferral and writeoff methods for development expenditure for the purpose. Indian standard also follows the IAS pattern almost identically. The propriety of the standards will be in question if such differences exist in the standards themselves. Conversely, directive for adopting only a single way provides no scope for alternative treatment. It may not be suitable in all cases. Accountants also may be displeased for such intrusion into the area of their authority. Hence, accepting the justification of the standards, set so far, it can be said that there is some scope for further improvement. Standards should be more specific to solve the serious problems involved in proper accounting treatment of R&D costs under varying circumstances. However, even though IAS, AS and SSAP have provided scope for treating it either as a capital expenditure or as a revenue one, stringent conditions are imposed for capitalising the same. It has, in effect, provided little scope for such alternative. However, effectiveness of the accounting standards on R&D costs and the comments made above in this respect needs empirical verification. Findings of the empirical study conducted for this purpose are given below:

**Empirical findings**

The observations stated above about the various aspects of accounting standards on R&D costs require support from empirical evidence. With a view to providing such evidence, an opinion
poll was conducted through applying questionnaire method. The study attempted to cover the eminent academicians, reputed professionals and renowned business executives. The object of the study is to verify, how for the issues raised in the standards are settled and to what extent various recommendations of the standards are in agreement with the opinions expressed by the academicians, professionals and executives and also to examine the propriety of the standards from different users point of view.

Findings of the empirical study are presented below:

1. Whether expenditure on pure research, applied research and development activities be taken in one accounting head or in separate heads is a question on which opinions differ widely. 37% of the respondents recommended these items to be taken in one accounting head while 54% did not support the idea and 10% remain undecided. These expenditures are expected to be shown in the relevant accounting heads according to the nature of activities. It is evident that majority opinions are in favour of showing the items separately, as suggested by NSF by their definition (vide page nos. 189-190). Anyway, the opinions do not give unique direction.

2. As regards the accounting treatment of cost of equipments and facilities acquired for a particular research project having no alternative future use, 54% of the respondents recommended this to be treated as part of R&D costs for the period and be written off instantly. While 46% suggested it to be capitalised and depreciated over the project life. While, American accounting standard (FAS-2) directed that above cost should be included in
R&D costs in the year of incurring the expenses, no such specific direction is available in other standards under our consideration (vide page no. 218, point - 1). Since the house is divided almost equally, no clear and uniform guideline is available here.

3. On the issue of accounting treatment of pure research cost, 47% of the respondents favoured it to be charged against revenue and 53% are in favour of capitalisation and amortisation. Accounting standards recommended it to be written off in the year in which it is incurred (vide page no.220, point - 2). Of the 53% respondents favouring capitalisation, majority are found to be academicians and others are professionals and executives. These eminent personalities may presumably thought that pure research activities also have some favourable effect on innovation. Thus, all are in agreement with one point that technical and economic viability is the pre-condition for capitalisation. However, difference of opinion persists and the issue requires further study.

4. This question deals with accounting for applied research cost. 39% of the respondents suggested it to be charged as expense, 2% are not aware of the issue and 59% favoured capitalisation. While, Indian standard permits such deferral of applied research cost in restricted way, International, English and American standards specifically directed it to be charged against revenue (vide page no.220, point - 2). Thus, uniformity on the issue is not yet ensured and accordingly it requires further investigation.
5. On the issue on whether the development cost be capitalised or not, 49% of the respondents recommended in favour of capitalisation, 10% are for charging it against revenue and 41% opined that its treatment should depend on the nature of development. American standard specifically recommended it to be charged against revenue while International, Indian and English standards provided scope for its capitalisation in limited way provided that certain conditions are fulfilled (vide page no. 220, point - 2). Thus, nearly 90% opinions are found to be in favour of capitalisation either directly or depending on the nature of development.

6. Regarding the condition, that R&D cost can be recovered only out of expected future benefit, for deferral of development expenditure, 62% of the respondents opined that such recovery should be the pre-condition while 29% disapproved the view and 9% are still undecided. Indian and English standards clearly imposed the pre-condition for expected recovery of development cost for its deferral treatment, International standard suggested the same condition while American standard provided no scope for deferral treatment (vide page no. 222, point - 3). Thus, the issue is still unsettled even though majority views are found to be in favour of deferring the charging of such costs where there is a clear possibility of its recovery out of future benefits.

7. In replies to the question on the issue of whether or not the policy of deferring the development costs in case of all development projects under similar conditions be followed uniformly, 46% of the respondents answered in affirmative while
8% in negative and 46% thought that the issue depends upon the circumstances. Excepting the American standard, all others, under our study, recommended directly or indirectly the uniform application of the policy (vide page no.225, point - 4). Thus, almost all are of the view that the policy of deferring the development costs, if adopted, should be uniformly practised for all the projects under similar conditions.

8. This question relates to the use of product or time as the basis for allocation of deferred R&D costs. 22% of the respondents are in favour of using product as the basis, and 71% in favour of time for the purpose, while only 7% did not favour any of the two methods. International, Indian and English standards have recommended the use of any of the product or time as the basis of allocation (vide page no.225, point - 5). Thus, 93% of the respondents are in agreement with the view expressed in the standards. It ensures almost uniformity in practice.

9. On the issue of frequency of reviewing the effectiveness of the commercial use of the development projects, 41% of the respondents suggested annual review. 59% of them thought that the appropriate timing should depend on the nature of the project. Accounting standards directed that the deferred development cost of a project should be reviewed at the end of each accounting period (vide page no.226, point - 6). While 41% opinions agreed with the standards in full, 59% also expressed the view that annual review may be conducted according to the nature of the project. Thus, none is against the recommendation of the standards.
10. As regards the issue, whether or not the unamortised balance of development cost be written off immediately when the possibility of it being commercially used no longer exists, 80% of the respondents answered in affirmative, 15% are against this view while 5% are yet to decide. Accounting standards have recommended it to be written off immediately when the criteria for deferral treatment of development costs no longer apply (vide page no.226, point - 6). Majority of the 15% respondents going against the view are found to be executive who presumably may think that commercial viability of one project may neutralise the nonviability of another project for its commercial use. Thus, almost all are in agreement with the standards.

11. This question relates to writing off the excess of unamortised balance of development costs over the expected future benefits. 64% of the respondents agreed to write it off, 29% disagreed to it and 7% did not decide. It is recommended in the accounting standards that the above excess should be written off (vide page no.226, point - 6). Majority of the 29% respondents disagreeing with the standards are found to be executives and academicians, who presumably may think that such excess can be recovered out of the expected benefits of other projects. Anyway, the issue requires further investigation.

12. This question deals with the issue of re-instatement of the development cost written off earlier when subsequent review shows that such cost can definitely be recovered out of future expected benefits. 55% of the respondents disagreed with its
re-instatement, 35% favoured it and 10% did not consider the issue. Accounting standards have not permitted such re-instatement, once it is written off (vide page no.227, point - 7). But, recent amendment to SSAP-13 has withdraw the provision for restriction on re-instatement. Thus, a very significant portion of the respondents go against the recommendation of standards, indicating the requirement of further investigation.

13. On the issue of disclosure of R&D costs in the financial statement, 100% of the respondents are in agreement with the recommendation of the accounting standards that R&D expenditure for the period should be disclosed in the annual accounts (vide page no.227, point - 8). Thus, the issue is considered to be settled.

14. As regards the disclosure of the movement in and the balance of unamortised deferred development expenditure in the financial statement, 95% of the respondents favoured its disclosure. International and English standards have specifically recommended the above disclosure while Indian and American standards are not so specific (vide page no.227, point - 8). 5% of the respondents who are against this disclosure are found to be professionals. Thus, a consolidated view is imminent from the investigation that movement of deferred development expenditure should be disclosed in the financial statement.

15. This question deals with the issue on whether or not the accounting policy for R&D costs including the basis for amortisation of deferred development expenditure be disclosed. 90% of
the respondents opined in favour of its disclosure and 10% go against it. Some accounting standards have recommended such disclosure directly and some others made it indirectly (vide page no.227, point - 8). Respondents going against the said disclosure are found to be professionals who presumably may think that such disclosure may make the accounting statement unduly large. However, the general view is found to be in agreement with the standards that accounting policy and the basis for amortisation of R&D costs should be disclosed.

Conclusion

Accounting standards come forward with a promise to settle a long standing debate at national and international levels about accounting for research and development costs. The crux of the problem is, whether R&D costs should be capitalised or not. This problem arises due to inherent difficulty of identifying the R&D costs directly with production.

In India, large volume of resource and energy was employed to resolve the issue. The standards have attempted to attain the objectives by issuing directives to be followed on the matter. Inspite of these directives, it may be inferred from the empirical findings, the controversy is not completely settled even amongst the ardent supporters of the standards. On some points opinions agree while on some other issues they differ.

As regards the accounting treatment of pure and applied research costs, opinions differ widely while there is a majority opinion that development costs should be capitalised. Although,
these issues are not settled, expert opinions are found to be in line with the recommendations of the standards on the issue of accounting treatment of costs of equipments and facilities acquired for a particular R&D project which have no alternative future use. Opinions and even the standards of different countries are found to differ widely leaving the matter still unsettled. Regarding the condition to be satisfied for deferral of development expenditure, majority opinions supported the view expressed in the standard that recovery of such costs out of expected future benefits should be the pre-condition for its deferral treatment. But, opinions against this view also exist. On the issue of uniform application of accounting policy, almost all the respondents to the empirical study are found to be in agreement with the standards that the policy of deferring the development costs, when adopted, should be uniformly applied for all the projects under similar conditions indicating the settlement of the issue. As regards the basis for allocation of R&D costs when they are deferred, experts uphold the recommendation of the standards that either product or time should be used as the basis for allocation. All the disclosure requirements of R&D costs stated in the accounting standards are fully accepted by various section of experts.

Thus, impact of accounting standards on R&D costs among the academicians, professionals and executives are found to be mixed one. While some issues are settled, debate is still
continuing on some other issues. Again, compliance with the standards is not ensured sufficiently. On the main issue, American standard does not permit deferral treatment but International, Indian and English standards recommended capitalisation only when there is clear possibility of recovery of the costs out of expected future benefits.

So, it can be concluded that at least a portion of R&D costs may be capitalised depending upon the probability of success of the research and development project. If the probability of success is high, a major portion of R&D costs may be capitalised and if it is low then a smaller portion may be capitalised. For example, if the probability of success of R&D project is 0.7 then 70% of total R&D costs may be capitalised and remaining 30% is recommended to be charged against revenue of the year concerned. But, how this probability can be measured is a very critical issue. It involves techno-economic enquiry.

Anyway, formulation of standard is undoubtedly a step forward and for its further improvement attempts should be made to resolve the unsettled issues. For the purpose, it is desirable to carry further investigation on the following areas:

1) Formulation of separate accounting standard on pure research and applied research costs.
ii) Providing more clear and specific criteria for identifying the elements of costs attributable to research and development.

iii) Accounting treatment of the costs of equipments and facilities acquired for a particular R&D Project with no alternative future use.

iv) Conditions to be satisfied for capitalisation of development costs.

v) Estimating the probability of success of R&D project.