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EDITORIAL

Apart from Presidential Address, six articles in different areas of accounting and auditing are included in this volume. Chhote Lal stresses, in his Presidential Address, the need for strategic planning for the development of accounting education and research in the country, in the context of a changing economic scenario. A. R. Unruh and M. R. Mathews deal with valuation and disclosure of brands and suggest that, in view of divergencies in the methods of valuation, consistent methods be devised by the accounting profession in order to disclose information useful to the users of financial statements. Tarkeshwar Pd Maitin highlights the social responsibility in audit expertise. Rajendra P. Srivastava and William F. Bentz reinvestigate the reciprocal cost allocation model for new information contents and show how the model can be implemented in a micro-computer environment. G. S. Batra and B. S. Bhatia deal with human resource accounting and its practices in India. Philip Siegel, Andre de Korvin and Kursheed Omer in their article, the Detection of Irregularities by Auditors: A Rough Set Approach, show how knowledge acquired through examples could serve as a basis of establishing rules for detecting irregularities by auditors. They also develop measures of how much trust could be placed on these rules. Prabhat Ranade examines an historical perspective of the evolution of standards in relation to inflation accounting in some developed countries and the role that research can play in offering guidelines for setting sound inflation accounting standards.

May I now draw attention of our members to the national and international conference news? I shall be personally happy if our members take interest in these matters. The proceedings of the XVII All India Accounting Conference of the Association are also printed in brief. Papers presented at the last annual conference could not be included for reasons beyond our control.

We continue to get this issue printed through Laser in spite of shortage of fund. I am grateful to Dr. J. B. Sarker, Secretary, IAA Calcutta Branch and Dr. S. C. Jain, Treasurer, IAA, for partly funding the publication of this volume. My colleagues who have helped me in the publication of this issue also deserve special thanks.

July 26, 1993

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PRESIDENTIAL ADDRESS*

Chhote Lal**

Hon'ble Prof. S. K. R. Bhandari, the Chief Guest. Respected Prof. R. K. Rai, Vice-chancellor, M.L. Sukhadia University, Prof. K. R. Sharma, the Organising Secretary of the Conference, Office Bearers and Members of the Association, Distinguished Guests, Ladies and Gentleman.

Let me capitalise the opportunity of welcoming you all this morning to the XVII Annual Conference of the Indian Accounting Association in Udaipur, one of the renowned historical cities of India, endowed with mountains and lakes. While the mountains motivate us to go still higher in our pursuit of learning, the lakes, symbolising peace, gravity and depth, animate us for serious efforts and in-depth thinking. Thus, the city of Udaipur is best suited for making seminal deliberations on a developing subject like accounting.

Accounting and the Changing Environment

In fact, accounting is still in its evolutionary stage. The pace of its development in a country is dependent on the knowledge and skill of professional and academic accountants and its usefulness perceived by the society. While the acquisition of knowledge requires the accountants (both professional and academic) to cope up with the fast coming literature on the subject both within and outside the nation, development of skill necessitates in-depth thinking and interaction with experienced accountants. However, the knowledge so acquired and the skill so gained will remain unproductive unless they are fully exploited for the welfare of the society. Since the information needs of the society change with the changes in environment, accounting must be adaptive to such changes so as to retain its utility. In fact, the very survival of an organisation, institution or a subject depends upon its concern for the environment. If it is not active in shaping its environment or atleast responding quickly to the impinging forces, it may fade over time or become obsolete.

In recent years, the environment surrounding Indian economy in general and Indian business in particular has witnessed tremendous and turbulent changes due to national and international events. The concept of globalisation, fast technological developments, mounting business complexities, increasing competition among accounting professionals, introduction of new financial instruments, growing consciousness about the maintenance of natural environment, widening of capital market, etc. are some major events to be quoted. These developments have brought about significant changes in the information needs of the business.

* Delivered at 17th Annual Conference of the Indian Accounting Association held at M.L. Sukhadia University, Udaipur (February 14-16, 1993).
** Reader, Faculty of Management Studies, Banaras Hindu University, Varanasi -221005.
With a view to responding to the above changing environment, today's accountant has to be an entrepreneur, financial, legal and tax advisor, global competitor, market analyst and environmentalist in addition to acquiring knowledge and skill in accounting.

Strategic planning for the development of accounting education in the country, therefore, necessitates the scanning of opportunities and threats to the profession caused by environmental changes, assessment of strengths and weaknesses of the present accounting education in the country in coping up with the new challenges and the formulation of objectives, goals, plans and programmes.

**Scanning of Opportunities and Threats**

Friends, the globalisation policy being pursued all over the world and the Indian policy of economic liberalisation have paved the way for the growth of multinationals in this country. While this development may be perceived as an opportunity to the accounting profession, it is expected to pose new problems.

Such a policy will require an improvement in the communicational ability, appreciation of social and cultural differences, a good knowledge of international financial and money markets, institutions and instruments, an awareness of foreign exchange markets and their operations, the techniques of reducing transactions, economic and translation exposures, methods of incorporating political risk, and international legal restrictions and tax laws. Unless these problems are overcome, it will be difficult for our accountants to compete with their overseas counterparts.

Rapid technological advancements have not only shortened the product life-cycle, but also the reaction and response time. To cope up with these developments, the accountants of today must be adequately equipped with the latest tools and techniques available for information processing retrieval and reporting.

An ever increasing world-wide consciousness about environmental protection is another significant development of great interest to the accountant because of increased informational requirements. Fulfillment of these informational needs call for strategic concepts and techniques for environmental disclosure.

In view of growing business complexities and fierce competition, multinationals the world over have adopted the strategy of forming combinations to meet the challenges. Even old rivals, particularly of Japan and U.S.A., are joining hands to face the challenges. Any combination agreement calls for the adequate knowledge of relevant statutory laws of host and home countries, exchange ratio and techniques of foreign exchange rate forecasting and prognostication of country risks.

The new issue market in India has witnessed an unprecedented zoom so much so that in a single year 1991-92, the new security issues floated were of the order of Rs. 15,000 crores indicating the maturity of Indian capital market and its investors. The recent security scam of massive scale is another incidence which gave a rude shock to the over-jubilant investors so much so that the entire capital market has been razed. This eventuality could have been averted and investors' interest well protected, had there been adequate provision for rigorous transparency of security transaction and its proper implementation and monitoring. Keeping in view the serious-
ness of the problem, the SEBI has laid down comprehensive directives to security brokers, mutual funds, merchant bankers and others for more transparency in the interest of the investors. This enjoins upon the accountants a great responsibility of assisting the government and government agencies in developing a suitable mechanism to safeguard the interest of the investors on the one hand, and to aid the issuing companies, stock brokers, merchant bankers, mutual funds and other institutions in the fulfillment of transparency requirements, on the other.

**Assessment of Strengths and Weaknesses**

A cursory look at the existing accounting education in the country reveals that both academic institutions and professional bodies like ICAI and ICWAI are engaged in imparting accounting knowledge. While the former provides conceptual knowledge, the latter focuses on advanced vocational training. However, there is lack of co-ordination and inter institutional motivation among these institutions.

As regards the curricula, the knowledge and training being given by both the academic institutions and professional bodies are not adequate to equip the recipients to cope with the new challenges as peters out above because neither there is in-built flexibility in their educational programmes, nor is there sufficient provision for continuous training of professionals and educators. In the present programmes, the entire emphasis is on the dissemination of conceptual knowledge and techniques without giving any background of information needs for which they are to be employed. It is because of this reason that a subject like accounting is creating disenchantment among the students.

Most of the academic institutions are still offering stereotyped programmes. Their efforts to update the programmes have only brought in old wine in new bottle. Further, there is no uniformity in the accounting courses being offered at the same level by different universities. Moreover, no specific courses could be introduced on social accounting, human resource accounting, government accounting, public enterprise accounting, railway accounting etc., although the demand for such courses were long felt in the country. On the other hand, professional institutes have been making appreciable efforts for updating their courses in response to changing market needs. Besides, there does not appear to be any provision for continuous training of educators and professionals in the country, except organising seminars, workshops, conferences and meetings which hardly provide an environment for discussing the challenges and alternative combating strategies in detail.

In the area of research as well, the performance of accounting may not be considered to be up to the mark, both in terms of quantity and quality as compared to that of other allied disciplines. Not only has the number of these researches been disheartening in the country, but most of them have also been poor in terms of approach and methodology so much so that they could scarcely make any contribution in solving the present accounting problems or developing new opportunities. Consequently, most of these researches could neither be used for teaching nor for professional advancement. Moreover, there has been no accounting research institution or national laboratory for accounting experimentation in the country, except the Research Foundation of the Indian Accounting Association set up recently in Calcutta and Research Development Association, Jaipur.
Thus, owing to heavy dependence on conventional wisdom, our teaching and research in accounting remained insulated from environmental exposure. Although the professional institutes have been alive to the environmental changes, their responsive efforts could hardly scratch the surface.

**Strategy Formulation**

Integrated development of accounting education in the country with in-built responsiveness to changing environment calls for the formulation of strategy in the light of the foregoing SWOT analysis. The strategy should be developed in such a manner that not only the strengths and opportunities are fully capitalised, but the weaknesses are also rectified to convert threats into new opportunities. Such a strategy will necessitate the following steps:

1. **Establishment of a Coordinating Machinery**

   A coordinating machinery should be established for having constant watch over the changing information needs of the users consequent upon the changing environment and to coordinate the activities of all the academic and professional institutions. Since IAA is the only accounting association in the country represented by both academic and professional accountants, this role may be assigned to a Task Committee of IAA, consisting of the representatives of the ICAI, ICWAI and the universities.

   The above Committee would be basically responsible for the development of integrated accounting education in the country. Whenever a material change in the informational needs is observed by this Committee, it will decide upon the response techniques and may suggest the changes to be made in the course curricula of different institutions and/or the organisation of a special training programme for professionals, accordingly. However, if the response techniques are not readily available, problems will be posed before the accountants. Such problems may be considered as fertile areas of research in accounting. These problems may also be discussed in detail with the Research Foundation of the IAA so as to give them a formal shape. They may then be communicated to the universities as thrust areas of research so that future accounting researches in universities are directed to these areas. A copy of all the accounting researches must be submitted to the Task Committee in order to enrich its responsiveness. Whenever it comes across an effective response technique, it should get it published in the relevant journals. If the technique is useful exclusively to chartered accountants, it should be published in their official journal. If it is specially useful to cost accountants, it should be published in the journal meant for them, and if it is of general use to the accountants, it may be published in the Indian Journal of Accounting. This will enhance the utility of accounting researches in the country and will establish a close relationship between accounting research and the accounting profession.

2. **Accounting Curricula and their Review**

   At the undergraduate level (B. Com.), the course curricula should include more foreign and regional languages to improve communicational ability of the students. The courses on accounting should not emphasise memorisation of concepts and principles; it should rather focus on the informational needs of the society and the application of concepts and
principles in varying real-life situations in the fulfillment of such needs. An awareness about the current accounting problems and the major research findings should also be created. Further, a habit of learning should be inculcated among the students so that they may continue the process of learning in their subsequent career as well.

At the level of professional training, specialised courses on international financial institutions and instruments, foreign exchange operations, international business laws, etc. should be added. The students should also be offered courses on emerging branches of accounting such as social and environmental accounting, public enterprise accounting, railway accounting, human resource accounting, etc. At the level, more emphasis should be placed on the case method of instruction.

The Task Committee should review from time to time both the professional and academic accounting curricula to ensure their coordination and responsive capability. The review is also required to ascertain as to what extent the changes suggested in the accounting curricula have been incorporated. Thus, the review of curricula will establish an intimate relationship between teaching and the practice of accounting.

3. Organising Refresher and Training Programmes

The knowledge once acquired and accumulated cannot be banked upon for ever, specially in the age of fast technological development and dynamic environment. The same is true with accounting also. As such, refresher courses should be organised for the professionals by the Task Committee at different branches of IAA from time to time in conjunction with the relevant professional institutes and/or universities so as to update their knowledge and improve their skill.

Training courses on the similar pattern may also be organised for educators. As far as possible, efforts should be made to expose the educators to the informational needs of the society, the role of professional and academic accountants in the fulfillment of such needs as also the problems being faced by the profession. This will go a long way in appreciating the accounting concepts, techniques and problems in their right perspective. They should also be made aware of the important research findings in accounting. These exposures will enable the educators to discuss in the classroom not only the concepts and techniques of accounting but also the information needs of the society and the problems in accounting. This will make the subject more interesting and motivate the students to select a problem oriented research in accounting, which may, in turn, be helpful to the profession. Thus, teaching and research will become complementary to each other.

Under the above suggestions each pair of the three triangular interacting components of accounting education—teaching, research and practice will have a two-way flow. For the successful implementation of the proposed strategy, all the participants, viz., IAA, ICAI and ICWAI, should join hands in the right spirit for the common cause of development of purposeful accounting education in this country.

4. Separate Department of Accounting

Till now, accounting could not receive the status of a separate discipline in the Indian universities although the professional institutes were established
decades earlier and a good number of graduates are seeking their career as professional accountants. A joint effort should, therefore, be made by the academic and professional accountants to prevail upon the Government to create separate department of accounting in different universities.

Friends, this is the high time to appreciate the threats to the accounting profession and to respond to the changing environment promptly, lest the opportunities once lost will be difficult to regain. In order to initiate the process, may I request my friend, Professor Bhabatosh Banerjee, the former President of the Association and the Chief Editor, Indian Journal of Accounting, to publish in the next volume of the Journal the titles of the accounting researches undertaken so far in India with the names and complete addresses of the authors, and a brief abstract of each one of them in the subsequent volumes?

My speech will remain incomplete if I do not express my gratitude to all the members of the Association who bestowed on me the greatest honour of serving the Indian Accounting Association as its President. I also had the honour of representing the Association in the VI and VII International Conferences on Accounting Education held in Japan and United States in 1987 and 1992, respectively.

I shall be failing in my duty if I do not express my gratefulness to the Organising Secretary and his team for organising so nicely the XVII Annual Conference of the Association. In fact, it is due to their efforts, zeal and hospitality that we could assemble here this morning for some noble cause.

Once again, I thank you all.

Jai Hind

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**Second International Accounting Conference of IAA Research Foundation**

The Second International Accounting Conference of the Indian Accounting Association Research Foundation will be held in Calcutta in January 22-23, 1994. The main theme of the conference is *Dimensions of Accounting: Challenges Ahead*. Major topics are:

- Globalisation and Capital Markets
- Emerging Dimensions of Accounting Research, and
- Regulation of Corporate Accounting.

All submissions must be received by **October 15, 1993**. Each contributor shall be required to submit three typed, double-spaced, copies of the full paper along with an abstract not exceeding 200 words in English. Each submission shall include a separate title page listing full particulars of the contributor(s). There shall not be any author identification either in the body of the full paper or in the abstract in order to facilitate blind review.

For further details in this respect contact Dr. Bhabatosh Banerjee, Professor of Commerce, University of Calcutta, Calcutta - 700 073.
SHOULD ANYTHING BE DONE ABOUT THE VALUATION AND DISCLOSURE OF BRANDS?

A. R. Unruh
M.R. Mathews**

Accounting for brands has become an important topic for accountants, chief financial officers, and marketers in the United Kingdom and Australia. North American accountants seem less concerned. Current differences appear related to such developments as conceptual frameworks, modified historical cost valuations and government backing for accounting standards.

1.00 Introduction

Accounting for brands has become an important topic for accountants, chief financial officers (CFOs), and marketers in the United Kingdom and Australia. Although accountants and CFOs in Canada and the United States have not paid much attention to this issue to date, marketers in these countries have become very interested in overseas developments. The valuation of brands is, therefore, an issue to be considered by both academic and professional accountants.

2.00 United Kingdom

Until it was superseded in 1990, SSAP.22 stated a preference for the instant write-off of goodwill against reserves. One problem with this presentation surfaced after takeovers, when, in some cases, purchased goodwill was greater than the acquiring company's reserves, and the consolidated accounts ended up showing negative shareholders' equity. In an effort to restore the balance sheet to what was believed to be a more sensible position, several U.K. companies began separating brands from goodwill and including them as assets on the balance sheet, at their current market value. Some companies went further and also included self-generated brand names on the balance sheet.

In an attempt to make financial statements more consistent, the Accounting Standards Committee (ASC) issued TR738 in 1989, stating that companies could include purchased brands on the balance sheet, but strongly discouraging the inclusion of self-generated brands as assets. After TR738 was issued, few companies included self-generated brands on the balance sheet, but many continued to separate purchased brands from goodwill, stating that a market transaction had taken place, and that the value of brands could be determined separately from that of goodwill.

* Professor of Accounting, University of Montana., U.S.A.
** Associate Dean, Faculty of Accountancy, Massey University, New Zealand.
In 1990, the ASC issued TR780 and ED52 which dealt with intangible fixed assets. The ASC proposed that brands should be included in goodwill and accounted for accordingly. In particular, brands acquired through business combinations were to be treated as purchased goodwill and amortised over a period of not more than 20 years.

TR780 Accounting for Intangible Fixed Assets stated that:

- an intangible fixed asset should be recognized in the balance sheet as a fixed asset in its own right if and only if:
  - either the historical costs incurred in creating it are known or it can be clearly demonstrated that they are readily ascertainable; and
  - its characteristics can be clearly distinguished from those of goodwill assets; and
  - its cost can be measured independently of goodwill, of other assets and of the earnings of the relevant business or business segment.


Based on these criteria, it appeared as though ASC would allow brands to be separately stated on the balance sheet. However, ED52 stated shortly thereafter that brands should be included within goodwill.

Prior to the issuance of TR780 and ED52, many British companies chose not to amortise brands included on the balance sheet, because in the opinion of most accountants the lives were not finite, and residual value often exceeded cost. In addressing this issue, the ASC concluded that companies are unable to predict with reasonable certainty that economic benefits will continue to flow indefinitely from an intangible fixed asset in its existing form.

One issue which remains unresolved in the U.K. is the fact that tangible assets are accounted for based on their value, whereas intangibles, including goodwill and brands, are not. Sherer (1991, p.179) noted that the brands issue is part of a larger debate which might be assisted by a conceptual framework for accounting.

Some of the current issues regarding brand valuation in the UK are discussed below.

2.10 Are Brands Separable from Goodwill?

Stobart (1989) has argued that brands and goodwill are separate issues and should be treated as such. A brand has a separate and independent legal status including any associated goodwill. Brands have been included as part of goodwill because accountants do not accept the methods of valuing brands and because of their "fundamental misunderstanding of the marketing, financial and legal characteristics of a brand." (Stobart, 1989, p.27)

The ASC, in TR 780 Accounting for Intangible Fixed Assets, stated that brands may be of considerable value of the business but it is seldom meaningful to recognise them individually for accounting purposes since the benefits from them are derived when they are used in conjunction with the assets and characteristics which go to make up the business. (ASC, 1990, p.153)
According to the ASC, brands are really a form of goodwill and should be accounted as such.

2.20 Reasons for Market Valuation

It has been stated that unless brands are included on the balance sheet, there is a danger of the business being undervalued in the market place. (Cooper & Carey, 1989, p.28). According to John Murphy, chairman of Interbrand, the British company that has conducted numerous brand valuation assignments for companies in the United States, Canada, Europe, Asia, and Australia, the increased need for brand valuations was brought about by the increase in mergers and acquisitions. According to Mr. Murphy, 'People are paying massive premiums to get their hands on brands and they want to crystallize values.' (Eisenhart, 1989, p.36)

Besides being an aid to merger calculations, brand valuation provides Interbrand's clients with a basis for more critical management, for establishing values for licensing purposes (both internal and external), for tracking marketing performance, and for understanding in detail the strengths and profitability of brands when buying or selling brands or brand-rich companies.

In a report published by the London Business School (LBS), researchers indicated that it might be acceptable to use unaudited brand valuations in management accounts, because the valuations' subjectivity and lack of verifiability are outweighed by their relevance to various management decisions.

2.30 Arguments against Market Valuation

Institute Research Board (UK) commissioned a team from the LBS to survey existing brand valuation practices and analyze valuation methods, the nature and separability of brands, and the impact of relevant accounting practices on financial markets. The research team sought the views of brand valuers, preparers, finance directors, and analysts. They concluded that brands should not be accounted for separately from goodwill and the rest of the business.

In response to those who believe that separating brands from goodwill and reflecting those brands at market value on the balance sheet allows the capital market to correctly value the business, the LBS research team stated that: "market analysts reveal very clearly that they have not been, and are never likely to be, impressed by balance sheet branding as presently practiced", furthermore, "such exercises disclose remarkable little new information about brands, and only the most naive analyst could be influenced by the impact of such soft information" (Carey & Cooper, 1989, p.28). Analysts and bankers were more interested in cash flow, interest coverage, and underlying asset values: "and their treatment of these is unlikely to be colored by the sudden appearance of an unexplained asset on the balance sheet." (Cooper & Carey, 1989, p.28)

With regard to valuation methods, the report stated that there is no generally accepted method of calculation. According to the research team, valuations currently used do not meet the requirement that an asset's magnitude be measurable and verifiable with reasonable certainty. They stated that it was impossible to identify a valid and objective way of separating a brand's incremental cash flow from that of the rest of the
business. Additionally, they thought that the issues of verifiability and separability would pose severe problems for auditors, because auditors will be able to audit only the process and not book values, because of the difficulty of separation of the brands.

At the time that the LBS report was issued, goodwill was written off against reserves in the UK. It did not affect net income, but it also did not appear as an asset on the balance sheet: The LBS report authors stated that a major goal of brand valuation by UK companies had been to repair or pre-empt equity depletion caused by SSAP 22, Accounting for Goodwill, and suggested that if goodwill were to be carried in the balance sheet with parallel treatment of intangibles, much of the immediate pressure for brand accounting would evaporate (Cooper & Carey, 1989. p.28). Another concern of the LBS was that: “a dangerous circularity may arise when accounts try to measure the economic value of the business rather than provide information for outsiders to do so.” (Cooper & Carey. 1989. p.28)

As Greener (1989) has observed, British companies that included the market value of their brand names in the balance sheet must be able to demonstrate their ability to earn adequate returns on those assets. He reminded managers that although including current brand values among fixed assets will bring the net asset value more in line with company’s market value, it can have a disastrous effect on the apparent return on capital employed.

2.40 Methods of Brand Valuation

Interbrand Group plc of London claimed that their technique could help companies place an accurate value on their brand names. Interbrand establishes a brand’s profitability and then analyses its strengths and weaknesses according to seven factors: leadership stability, international presence, investment support, trademark protection, long-term trends, and stability of the brand’s market. Interbrand then develops a multiple it applies to the brand’s profit to determine the brand’s asset value. (Eisenhart. p.36)

Interbrand’s executive consider their techniques to be more accurate than others based exclusively on market value, the cost of a brand’s research and development, or marketing and advertising, because it includes other factors including financial, accounting and marketing practices. (Eisenhart. 1989. p.36)

Stobart (1989), managing director of Interbrand, admitted that subjectivity is involved in valuing brands, but did not think that there was any difference between seeking help on brand valuation and on the valuation of property. (Stobart. 1990. p.27)

3.00 Australia

The Australian Accounting Research Foundation (AARF) published draft ED49, Accounting for Identifiably Assets in August 1989. Goodwill in the Australian standard was defined as ‘the future benefits from unidentified assets.’ When acquired, goodwill is included as an asset on the balance sheet and is amortised over a maximum period of 20 years. Self-generated goodwill is not included on the balance sheet.

Brands are accounted for differently, however. Acquired as well as internally-developed brands are included on the balance sheet, and are
amortised over the period of time during which benefits are expected to arise. The amortisation period is not set at any maximum number of years. However, ED 49 requires detailed disclosures when the period exceeds 20 years.

Australia, which uses a modified historical cost accounting system, requires revaluation of assets, including goodwill and brands, when their market values differ from initially recorded costs of acquisition. ED 49 requires brands to be 'recorded at the lowest cost at which the assets could currently be obtained in the normal course of business.' (Rutteman. 1990, p.26)

Because of the different methods of accounting for goodwill and brands, many Australian companies are now separating brand names from goodwill and including them on the balance sheet. Ernst & Young conducted a survey in Australia and found that 30 out of Australia's top 150 companies were now including some amount for brand values, newspaper mastheads or other intellectual property in their accounts. Rutteman is critical of the Australian standard in that it prescribes different accounting treatment for similar assets. One important difference between the Australian and UK positions is the support given by the conceptual framework in Australia.

4.00 United States and Canada

In a study conducted by Collins in 1990, the Chief Financial Officers (CFOs) of 68 large North American corporations responded to a questionnaire regarding their interest in including brand values on the balance sheet. Contrary to expectations, the CFOs were "opposed to brand valuation in almost every instance and in almost any form—even for the purpose of internal use."

When exploring reasons for differing attitudes between countries which hold the same basic philosophy of accounting (US and Canada vs. UK), Collins pointed to the existence of the SEC and the FASB in the US. These bodies, "whose legal positions are much more deeply entrenched than that of regulators in the UK," have set explicit rulings on the procedures for the write-off of intangible assets. (Collins. 1990, p.2). Related to this is the fact that the US and Canada prohibit the revaluation of fixed assets.

Collins offered other reasons for the strongly negative attitude found among North American CFOs. These included a possible lack of information regarding the development of brand valuation practices and differing philosophies of brand management and control between the US and Canada and other countries. Although Collins found that North American CFOs were not interested in reporting brand values on their balance sheet, other American managers have spoken up with regard to the issue. Marketing and financial managers are criticizing CFOs for using only traditional measures such as cash flow, sales, and profits to value companies. They have pointed to the importance of attempting to value brands, especially with regard to mergers and acquisitions.

Allan Baldinger, Director of Marketing Research for the Advertising Research Foundation (ARF), believes that there are four major trends from outside the traditional world of marketing research that are propelling the interest in brand equity measurement: brand dominance, the new products to brand extension shift, new learning on the advertising and promotion
mix, and the merging of financial and marketing needs and principles. (Baldinger, 1990, p.3)

Baldinger has stated that strong profits come from brand dominance, consequently, building and maintaining strong brands is very important. With regard to the shift from new products to brand extensions, there is a refocus away from building brands from scratch. In addition, marketers have discovered important trends in advertising and promotion with regard to brands. He argued that product quality perceptions, fostered by brands, are becoming more important than price.

Regarding his fourth point, the merging of financial thinking with marketing, Baldinger suggests that a firm's financial decision will be increasingly dependent upon marketing decisions in the 1990's. Whereas marketing spending was thought of as merely an expense in the 1970's and 1980's, those expenditure will be considered as increasing the value of companies' franchises in the 1990's. In order to more clearly understand the importance of brands, the ARF has established a Brand Equity Committee. The committee found that the concept of brand equity is difficult to define and measure.

US and Canadian accountants, both managerial and financial, will undoubtedly become more involved in brand valuation decisions as companies become more aware of valuation techniques being developed abroad as well as by domestic marketers. Although including the market value of brands on the balance sheet is not possible under the present historical cost convention, valuation is certainly possible and increasingly necessary for internal purposes. Unless the accounting profession develops methods of brand valuation and supplies this information to management, marketing and financial managers will develop their own calculations which may or may not be based on sound accounting practices. With regard to financial accounting, brand valuation points to many of the same questions and arguments raised by US and Canadian accountants in respect of other issues:

1. Should the costs of internally developed brands be considered assets or should they be immediately expensed?
2. Do financial statements based on historical cost provide investors, creditors, and other stockholders with relevant information?
3. Would financial statement be more relevant to users if current value information were included as supplementary information?
4. Could current values be considered neutral and could they be verified?
5. Would the cost of establishing and verifying current values outweigh the benefits derived from the information?

5.00 Should the costs of internally-developed brands be considered assets, or should they be immediately expensed?

Assets are defined by the FASB Statement of Financial Accounting Concepts (SFAC) No.3 as: probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events. The three basic characteristics are (1) probable future economic benefits,
Based on this definition and these characteristics, brands would be considered an asset. The entire purpose of establishing strong brand names is to incur future economic benefits, through increased sale to loyal customers, or through an increased sales price of the brand itself or the business that owns the brand. Oftentimes, those future values are difficult to measure, but according to Hendriksen: the fact that the future value of a right or service potential may be uncertain does not remove it from the definition of assets. The uncertainty affects the valuation, but it changes the nature of the item only if the uncertainty is so great that the expected future benefit is zero or negative. (Hendriksen, 1982, p.251)

Companies with valuable brands register those names, and are legally entitled to sole ownership and use of them. There is no question of control over them. Finally, brands are created through marketing efforts over time; they are the result of several past transactions and events:

Expenses are the using or consuming of goods and services in the process of obtaining revenues. They are the expirations of factor services related either directly or indirectly to the producing and selling of the product of the enterprise. The values of these factor services expire when they leave the enterprise by final consumption or by the transfer of the product to customers. (Hendriksen, 1982, p.187)

Since the value of brands does not leave the enterprise in the same period as marketing expenditures are incurred, most of these expenditures should not be considered expenses in the period incurred. Additionally, in order to properly match expenses with revenues, marketing expenditures which create brand value should not be treated as expenses until the period’s revenue is realized.

In the US all marketing expenditures are expensed as incurred. No asset is established for the future benefits of those expenditures, and no calculations are made regarding the value of brands. This is inconsistent with the way other organisational resources are accounted for, leaving brand managers at a disadvantage when competing for finite organisational resources. Treating expenditures for investments in brands as expenses rather than as assets results in a distorted measure of an organization’s return on investment and therefore creates problems for investors who attempt to value an organization. Since return on investment is the ratio of net income to total assets, the ratio is distorted when brands are all accounted for in the denominator. Consequently, investors must attempt to adjust for brand investments if they wish to base decisions on an organisation’s return on investment.

Another result of including all brand costs as expenses in the income statement is the unintended emphasis on short-term results. This could motivate management to disregard the long-term interests of the organization and emphasise short-term results because management are concerned with the “bottom-line,” and under current accounting practice, brand expenditures directly decrease net income.
6.00 Are financial statements relevant and reliable when they are based only on historical cost information?

SFAC No.2 defines the primary qualitative characteristics of accounting as relevance and reliability. Relevance of accounting information is determined by its timeliness, feedback value, and predictive value. The FASB argues that the principal concern of existing investors and creditors is to evaluate prior expectations about cash flows that occurred in the current period. With the inclusion of the Statement of Cash Flows, these users should be able to make that evaluation. Historical cost provides relevant information to them.

However, the principal concern of potential investors and creditors and a related concern of existing providers of fund is the prospect for favourable cash flows in the future. Balance sheet and income statement information, including the related disclosures, should be presented in a manner that facilitates evaluation of the prospect for future cash flows. Regarding prediction, recording assets at fair value seems to give financial statement users more relevant information than assets based on historical cost. Because of this, assets such as inventories and financial instruments must now be reported at their fair value, if that value is less than original cost.

In the US, materiality is sometimes used as a proxy for relevance. Auditors traditionally have treated materiality quantitatively, calculating a threshold dollar amount of assets, liabilities, revenues, and expenses, which supposedly depicts financial statement users' boundary of relevance. As accountants become increasingly concerned with supplying information to identified users, after determining those users' needs, materiality has become much more qualitative. Materiality is no longer a set of numbers, but is a determination of what items users need to make informed decisions, and which of those items users are most sensitive to.

As the concept of materiality evolves, the demand for more relevant information will increase. Accountants will search for new and better ways to supply financial statement users with the information they need to make informed investment decisions. Issues such as reporting assets at fair value will become increasingly debated. This will probably eventually lead to a widespread interest in determining and disclosing the value of non-traditional assets such as brands. Examples of these concerns can already be found.

The US position would appear to be that while historical cost information might not provide the most relevant information, it continues to be the most reliable. Historical cost is verifiable and neutral, and it represents what it purports to represent. Measuring the fair value of assets presents problems with reliability. The FASB is currently wrestling with the issue of whether market value or present value of future expected cash flows is a better approximation of fair value.

7.00 Concluding Comments

Financial and marketing managers and investors in the English speaking accounting countries have become increasingly interested in determining the value of brands. Because of a lack of support from the accounting profession, these financial statement users are developing their own methods for calculating brands values. If standard-setting bodies were to
recognize that the valuations are necessary, then consistent methods of valuation could be devised by the accounting profession.

As long as the balance sheet continues to be presented on the historical cost basis, brand valuations could be presented as supplementary information to the financial statements, thereby satisfying the needs of managers and investors alike.

The current positions in Australia, the UK and North America have been described and found to be different. These differences are probably related to other developments such as conceptual framework projects, valuations other than by strictly historical cost and the degree to which accounting standards are government backed.

These issues point to the need for further research, to examine not only the necessity for and methods of valuing brands, but also the general need for more relevant and consistent information. If financial accountants are going to continue to do what they purport to do, to provide information useful to financial statement readers, then they must remain aware of what information the users need and want.

References
SOCIAL RESPONSIBILITY IN AUDIT EXPERTISE

Tarkeshwar Pd Maitin

This paper highlights the social responsibility in audit expertise on the basis of three approaches: (a) audit as an essential process of accounting, (b) statutory and professional limitations of a company auditor, and (c) his social responsibility in a developing economy.

1. Accounting and Audit

Accounting is a continuous process. It is a valuable aid to modern management. It is the basis of careful decision-making. It is a guide to operational information and a true representative of the financial status of an organisation. Accounting, therefore, extends a reliable assistance to performance evaluation and forecasting assessment. Yet, accounting is not complete in itself. It needs credibility. It has to be true and fair. The process is not complete until it has been examined in respect of its correctness so as to minimise errors and frauds. Any honest record of accounting data, therefore, expects an expert verification which has been the major audit responsibility. Thus accounting and audit cannot be separated from each other if the purpose is to present a correct and complete set of financial statements. In fact, accounting and audit form part of a combined process supplementing each other. Hence any ethics in accounting demands an equal emphasis on the ethical aspects of auditing as well with a view to producing some relevant and reliable system of financial information. This obviously means an active participation of auditors in the process of verification of accounts and a full trust on their behavioural approaches to audit assignments.

2. Role of Auditors

An auditor is an independent expert. He is a professional accountant appointed for the purpose of verification of credibility of accounts. His main task is to examine the accounting records so as to satisfy himself that they present a true and fair view of the state of affairs. The auditor evaluates the financial statements and submits a report to the company. The whole exercise, however, is governed by relevant statutory provisions. As these provisions are mainly based on company law, they affect the position of an auditor in a company. Auditor's position in a sole proprietorship concern or a partnership firm depends upon mutual agreement. While a company auditor has to operate under the prescribed rules, an auditor of a partnership firm or a sole proprietorship concern can enjoy some flexibility of conditions. Yet, the audit procedures, work responsibility and verification methodology remain almost similar in all classes of audit. In fact, an auditor

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works on behalf of the members of the company. The shareholders contribute capital to the business and they appoint an auditor to ensure that their funds have been properly utilised. Thus, an auditor is a professional representative to examine the correctness of accounting records and to report upon the operational results of the business in a statutory manner.

An audit assignment, therefore, is not an easy task. It involves both legal and ethical considerations. The legal provisions govern the position of the auditors and guide their attitude to work. This is primarily done to protect the sanctity of the auditing profession. The whole idea is to add reliability to the audit expert who is expected to verify the reliability of accounting records. This has often been appreciated as the concept of professional independence in audit management. Moreover, with a view to discouraging unauthorised audit practices, the law accepts only members of a recognised body of accountants as the persons qualified to be appointed as statutory auditors. To enhance the interests of impartiality, however, officers or employees of the company, or their partners, are disqualified from being appointed as a company auditor. The right to appoint an auditor generally rests with the shareholders of the company who can appoint, reappoint or remove an auditor at the general meeting of the company.

3. Rights and Duties

Rights and powers assist effective performance of duties. Auditors too have been granted certain legal rights to enable them work in an independent and efficient manner. An auditor is empowered: (a) to receive notices of all general meetings of the company and to attend such meetings, (b) to be heard at all general meetings of the company on any matter which concerns him in his capacity as auditor, (c) to have access at all times to all books, documents and vouchers of the company, (d) to require from the officers of the company such information and explanation as he considers necessary for the purposes of his audit, and (e) to request subsidiaries and their auditors to provide such information and explanation as may be needed in course of their duties. When an auditor is being removed from a company before the expiry of his term of office, he has a right: (i) to receive a copy of the notice incorporating the proposed resolution to be considered at the general meeting, (ii) to represent and circulate his case among the members of the company, (iii) to attend and be heard at the proposed meeting, and (iv) to communicate to the next auditors of the company the circumstances under which he was removed before the expiry of his term of office.

Thus auditors have almost unrestricted rights to examine evidences, conduct enquiries, collect information, seek explanation, visit branches and contact outside parties for verification of credibility of accounts. By all this, they try to discover the truth so that the financial statements of the company show the fair state of affairs of the business.

Rights and duties move together to maximise management efficiency. The main duties of an auditor are: (1) to make a report to the appropriate authorities (e.g. the members of the company) on the accounts examined by them. (2) to state in the report whether in their opinion the financial statements have been properly prepared in accordance with the relevant legal provisions, and whether they have obtained all the information and explanation which to the best of their knowledge and belief were necessary for the purposes of their audit. (3) to also mention in the report whether
in their opinion a true and fair view of the state of affairs is given by the financial statements for the financial year to which they relate. and (4) to carry out such investigations as will enable them to form an opinion on the following matters: (a) whether proper books of accounts have been kept by the company and proper returns adequate for their audit have been received from branches not visited by them. and (b) whether the financial statements are in agreement with the books of accounts and returns.

As auditors are expected to act with reasonable care. competence and skill. it is also their duty to keep themselves informed of the changes in the standards of audit practices. The moment they fail to devote proper attention to their statutory duties resulting in negligence and causing a financial loss to their clients. they attract liabilities to compensate for that loss. They need not necessarily be suspicious to detect manipulations or misappropriations; they must be honest. Thus even a slight negligence on the part of the auditors towards their statutory duties reflects upon their professional performance. It is this which makes auditing a highly responsible legal assignment.

4. Managerial Skill

Statutory qualifications. however. are not enough for a successful audit management. An auditor must also have in him certain qualities of development. A good auditor combines his rights and duties with independence and integrity. This needs in him adequate knowledge of accounting. good character. tactfulness and intelligence. honesty and faithfulness. caution and patience. vigilance and accuracy. impartiality and morality. and skill and judgement. It is a balanced utilisation of qualifications and qualities. therefore. which allows the auditor to translate the statutory policies into action with efficiency. effectiveness and independence.

The major responsibilities of auditors which expect application of skill as well as ethics are: (i) a critical review of the systems of accounting and control. (ii) a reliability test of accounting records. (iii) a comparison of the financial statements with the books of underlying records. and (iv) a concluding report on the true and fair view of the state of affairs of the business. This statutory responsibility of the auditors involves the major verifications that: (a) sound accounting principles have been followed. (b) the basis of accounting has not changed from year to year. (c) distinction between capital and revenue items has received proper treatment in books of accounts. (d) assets are supported by physical existence. right ownership and correct valuation on a consistent basis. (e) liabilities are included in the books of accounts at proper figures. (f) accounts appear to be reasonable as compared to the corresponding results of the previous year. (g) profit and loss items do not reflect any significant variation from the previous period without adequate justification. and (h) company accounts fulfil the statutory requirements and disclose the relevant information in the desired manner. The principal audit assignment. therefore. is to conduct an examination of accounting records so as to satisfy that they do not suffer from any type of irregularities. either of errors or frauds involving misappropriation of funds or manipulation of accounts.

5. Professional Challenge

Auditing Standards and Guidelines identify the role and responsibility of auditors as follows:
1. The responsibility for the preparation of the financial statements and the presentation of the information included therein rests with the management of the enterprise (in the case of a company, the directors). The auditor's responsibility is to report on the financial statements as presented by management.

2. The responsibility for the prevention and detection of irregularities and fraud rests with the management, who may obtain reasonable assurance that this responsibility will be discharged by instituting an adequate system of internal control.

3. The auditor's duties do not require him specifically to search for fraud unless required by statute or the specific terms of his engagement. However, the auditor should recognise the possibility of material irregularities or fraud which could, unless adequately disclosed, distort the results or state of affairs shown by the financial statements. The auditor should, therefore, plan his audit so that he has a reasonable expectation of detecting material mis-statements in the financial statements resulting from irregularities or fraud.

4. The auditor should ensure through planning, control and recording of work that an audit is carried out effectively and efficiently. He should also examine the adequacy of the system of recording and processing transactions as a basis for the preparation of financial statements.

5. The auditor should obtain relevant and reliable audit evidence sufficient to enable him to draw reasonable conclusions therefrom. He should review the financial statements, along with the conclusions drawn from the other audit evidence obtained, to give him a reasonable basis for his opinion on the financial statements.

The behavioural aspects of audit assignment, therefore, establish a professional challenge to the modern auditor. It is a test of his tactfulness as to how best he combines the techniques of auditing in expressing his opinion on the financial statements which he is signing. It is also a professional challenge to demonstrate how effectively the auditor is discharging the function of social accountability in respect of a true and fair view of the state of affairs of the financial statements which are under his examination.

6. Public Confidence

An audited set of accounts commands greater public confidence with regard to its credibility and reliability. Auditors, therefore, play an important role in the modern economy. Their task is not only to verify the accounting records and report on the state of affairs of the company. They are more constructive. They can change the shape of things; improve the system of control and can contribute to an all-round development of the company. The major goal of an auditor, therefore, is maximisation of efficiency of operations in the company he audits. This means that his examination and observation need not remain confined to finances only. He should cover
both men and money. Unless all the resources get a productive application, results of performance may not be satisfactory. Hence an auditor's responsibility today is not only to detect errors and frauds through a suitable procedure of verification, or to report on the true and fair view of accounting records, he has also to suggest appropriate changes in the methods of internal management. When an auditor works in the best interests of the company, he identifies the areas of weakness and reduces the possibilities of such weakness in future. An auditor's contribution to the promotion, operation and expansion of a company, therefore, commands a valuable potentiality to the process of economic development of a country as well.

The major purposes of statutory control over audit operations and behaviour are:

1. to ensure that only skilled and independent persons with recognised professional qualification and competence are allowed to serve as auditors;
2. to protect the rights of the members to appoint auditors of their choice and to prevent the possibility of their removal without the assent of the members or without their full knowledge of the facts;
3. to promote an unbiased and authoritative opinion on the accounts and operational results;
4. to extend wider powers of enquiry and investigation to the auditors;
5. to give an opportunity to the auditors to submit an honest report on the state of affairs of the company;
6. to protect the interests of the shareholders through a process of verification based on generally accepted principles of accounting and recommended accounting standards followed by the auditors;
7. to satisfy that the company management is conducted in accordance with the relevant provisions of law;
8. to allow the published financial statements of a company enjoy reasonable public confidence about the correctness of accounting information;
9. to encourage auditors fulfil their assignment with reasonable care and skill, without causing negligence to their prescribed responsibilities, and with due regard to the professional pronouncements; and
10. to devise suitable techniques of audit management in the light of the changing needs and expectations of the society.

7. Conclusion

Thus auditors share a heavy social responsibility. It is their initiative and enterprise which governs proper utilisation of resources. How far such utilisation has been without manipulation or misappropriation, regulates the ultimate efficiency of operations in the business. It is this efficiency which generates adequacy of returns in the form of dividend to the shareholders. It is this efficiency again which affects the cost of performance.
involving the interests of the consumers in the society. Frauds create a social cost. Misuse of funds produce an additional financial burden. While the auditor continuously attends to his social responsibility delegated by law, he cannot forget his moral responsibility to the people at large. His approach and behaviour make him an useful partner to the social and economic progress of the country as a whole. It is this which demands an effective audit management to discharge the heavy social responsibility which has been entrusted to this professional expertise from time to time. Audit, therefore, is a symbol of public trust and people's confidence in the system of verification of accounting information.

To sum up, auditors who are successful in their operation by performing their assigned duties with due expertise, honesty and independence, render significant social service. Whenever they detect or discourage errors or frauds, their contribution benefits different sections of the society:

(i) to the shareholders of the company in obtaining a true and fair view of the state of affairs and in improving their return on investments.

(ii) to the public, in general, in getting reliable information through published financial statements.

(iii) to the personnel of the company in disbursing proper remuneration (including bonus) for their services.

(iv) to the consumers in supplying goods and services at minimum prices and higher quality.

(v) to the management by increased profitability and better reserves.

(vi) to the creditors of the business in providing a better assurance about the financial stability of the concern. and

(vii) to the organisation as a whole in an efficient formulation and execution of policies.

All this, combined together, assists the entire economy in balanced industrialisation, improved standard of living, better employment opportunities, peaceful labour relations and minimised company liquidations. Social ethics in audit expertise, therefore, is an essential process of economic growth which encourages an active participation of resources in programmes of development.

**Annual Convention of RDA**

The Second Annual Convention of the Research Development Association, Jaipur (RDA), will be held at Hubli, Karnataka, from September 11 to 13, 1993. There will be technical sessions on Finance followed by a seminar on Liberalisation in India. For further details contact: Dr. Sugan C. Jain, Secretary, RDA, 4-Ma-22, Jawahar Nagar, Jaipur-302 004.
RECIPIROCAL COST ALLOCATION MODEL: EXTENSIONS AND IMPLICATIONS

Rajendra P. Srivastava

William F. Bentz

The paper has reinvestigated the reciprocal cost allocation model (RCAM) for new information contents and has shown how the model can be implemented in a microcomputer environment. In particular, general relationships among various quantities of interest for managerial decisions are derived in matrix forms. These relationships facilitate application of RCAM in microcomputer environment using electronic spreadsheets like Lotus 1-2-3 (Rel. 2.0 or higher) or Excel. The general relationships derived in the paper are used to perform sensitivity analyses to see the effects of: (1) changes in variable costs on the marginal costs, (2) changes in demands of production outputs on service departments' outputs, and (3) changes in technology (that would affect consumption of services by production departments) on service departments' outputs. Also, general expressions are derived for the new demand of services, avoidable variable costs, and variable costs savings when one or more service departments are closed. These expressions reduce to Capettini and Salamon results for one department discontinuance case and provide the same results as obtained by them for two departments discontinuance case using an alternative approach.

1. Introduction

The purpose of this paper is to reinvestigate reciprocal cost allocation model (RCAM) for new information contents that have not been explored in the literature and to show how it can be implemented in a microcomputer environment. In particular, general relationships among various quantities of interest for managerial decisions are derived in matrix forms. These relationships are used to perform sensitivity analyses to see the effects of: (1) changes in variable costs on the marginal costs, (2) changes in demands of production outputs on service departments' outputs, and (3) changes in technology (that would affect consumption of services by production departments) on service departments' outputs. Such an analysis should be useful for planning and budgeting purposes. The manager can consider several scenarios and their impacts on different departments simply by making if-then analysis using RCAM. Also, we investigate the application of RCAM for making economic decisions regarding closing certain service departments and purchasing the services from outside. General expressions are derived for the new demand of services, avoidable variable costs, and variable costs savings when one or more service departments are closed. These expressions reduce to Capettini and Salamon results for one department discontinuance case and provide the same results as obtained by them for two departments discontinuance case using an alternative approach.

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department discontinuance case and provide the same results as obtained by them for two departments discontinuance case using an alternative approach.

In 1987, Jacobs and Marshall proposed an approximate method for determining service department costs when reciprocal services exist. They demonstrate that under certain conditions, their method produces service costs that converge to allocations under the theoretically correct reciprocal method. They also demonstrate that their method is more accurate than the two commonly used methods: direct method and step method. However, their approximation fails under certain conditions. It seems the main reason for their approximate model is to obtain reasonably accurate marginal costs information for service departments' outputs for managerial decisions that are not available without the use of RCAM. Our main concern here is why do we need an approximation to RCAM? Is it because the Jacobs and Marshall approximation is easier to understand or because RCAM is uneconomical to implement? We feel in response to the first question that there is no need of any approximation when RCAM provides much more information than what is available by such an approximate method as demonstrated in this paper. In response to the latter two questions we feel that the Jacobs and Marshall approximation is not any easier to understand than the theoretically correct RCAM, and availability of electronic spreadsheet programs like Lotus 1-2-3 (Rel. 2.0 or higher) and Excel make implementation of RCAM trivial in microcomputer environment [Srivastava and Chandra, 1991. Srivastava, 1991].

One of the main concerns by educators in not emphasizing RCAM applications in the classroom has been the inability of inverting matrices of large dimensions without the use of main frame computers [e.g., see Horngren and Foster, 1987]. This concern is not any more valid: Lotus 1-2-3 (Rel. 2.0 or higher), for example, can invert matrices of maximum size 90x90 within reasonable time. Now, it is time that usefulness of RCAM be emphasized in classrooms and its applications be explored further for managerial decisions.

This paper is divided into five sections. A brief review of RCAM model is presented in the next section. Section 3 presents a sensitivity analysis using RCAM for managerial decisions. Application of RCAM for outsourcing decisions are investigated in Section 4. Finally, a summary of the paper is presented in Section 5.

2. RECIPROCAL COST ALLOCATION MODEL (RCAM)

There are two representations of the reciprocal cost allocation model. One representation uses an input matrix \( B \) which is based on the "proport-
tion-of-output” of service departments to other service departments. The other representation uses an input matrix $A$, which is based on the “technological” factors. Each element $a_{ij}$ of matrix $A$ represents the number of units of outputs of service department $j$ required for each unit of service department $i$. Both representations are discussed in detail by Kaplan (1973, 1982). However, a brief discussion of each is presented below for completeness.

2.1 Representation Based on Proportion-of-Output (B-Matrix Approach)

For a firm with $r$ service departments and $n$ production departments, the reallocated costs to various service departments are given by the $r \times 1$ matrix $X$, such that

$$X = (I - B)^{-1} b$$

(1)

where, $I$ is an $r \times r$ identity matrix, $B$ is an $r \times r$ matrix representing the proportions of service departments’ output to other service departments, and $b$ is an $r \times 1$ matrix representing the direct costs incurred by the corresponding service departments (see Table 1 for detailed definitions).

The costs of service departments finally allocated to production departments are given by the $n \times 1$ matrix $D$, such that

$$D = CX$$

(2)

where $C$ is an $n \times r$ matrix representing the proportion of service departments’ output to production departments. Introducing an $n \times r$ matrix $N$ (Moriarity, 1987) the costs allocated to production departments can be written as:

$$D = CX = C[I - B]^{-1}b = Nb$$

(3)

where $N = C[I - B]^{-1}$ and each element $n_{ij}$ of the matrix $N$ represents the proportion of $j$th service department’s direct cost to be allocated to the $i$th production department.

**TABLE 1**

List of Symbols for Reciprocal Cost Allocation Model (RCAM)

- $a_{ij}$: The number of units of output of service department $j$ required for each unit of output of service department $i$.
- $A$: An $r \times r$ matrix with elements $a_{ij}$'s where $r$ represents the number of interacting service departments.
- $b_i$: The direct variable costs incurred by the $i$th service department.
- $b$: An $r \times 1$ matrix with elements $b_i$'s.
- $b_{ij}$: The proportion of the $j$th service department’s output provided to the $i$th service department.
- $B$: An $r \times r$ matrix with elements $b_{ij}$'s.
- $c_{ij}$: The proportion of the $j$th service department’s output to the $i$th production department.
- $C$: An $n \times r$ matrix with elements $c_{ij}$'s where $n$ represents the number of production departments.
- $D$: An $n \times 1$ matrix representing the costs that are finally allocated to production departments.
pk - The external unit price for the output of the kth service department that is to be closed.

\( P_{ij} \) - The number of units of outputs of service department \( j \) required for each unit of output of production department \( i \).

\( P \) - An \( n \times r \) matrix with elements \( P_{ij} \)’s.

\( q_j \) - The quantity of output of the \( j \)th service department.

\( Q_d \) - An \( 1 \times r \) matrix with elements \( q_j \)’s.

\( \Omega_d \) - An \( r \times r \) diagonal matrix with \( q_j \)’s being the diagonal elements.

\( u_j \) - The number of units of output of production department \( j \).

\( U \) - An \( 1 \times n \) matrix with elements \( u_j \)’s.

\( U_d \) - An \( n \times n \) diagonal matrix with \( u_j \)’s being the diagonal elements.

\( v_l \) - The traceable variable unit cost for the output of the \( l \)th service department.

\( V \) - An \( r \times 1 \) matrix with elements \( v_l \)’s.

The advantage in using \( D = N b \) (called the net approach) instead of using \( D = C X \) (called the gross approach) is that the matrix \( N \) gives directly the proportion of each service department’s costs charged to various production departments. This type of cost breakdown results in making journal entries easier to record and analyze [see Moriarity, 1987]. Further, since the \( N \) matrix gives the percentages of each service department’s costs charged to production departments, any change in service departments’ costs is immediately reflected by a corresponding change in production departments’ charges.

The marginal costs of outputs of service and production departments, respectively, can be given in the \( B \) matrix representation as [Kaplan, 1973]:

\[
M_s = \Omega_d^{-1} X = \Omega_d^{-1} [I - B]^{-1} b \\
M_p = U_d^{-1} D = U_d^{-1} C X = U_d^{-1} C [I - B]^{-1} b = U_d^{-1} N b
\]

where \( \Omega_d, U_d \) are diagonal matrices with elements of \( Q \) and \( U \) as their respective diagonal elements (\( Q \) is an \( 1 \times r \) matrix with elements \( q_j \) representing the output of \( j \)th service department, and \( U \) is a \( 1 \times n \) matrix with each element representing the number of units of output of production departments), and \( \Omega_d^{-1} \) and \( U_d^{-1} \) are inverse of \( \Omega_d \) and \( U_d \), respectively.

2.2. Representation based on “Technological” Factors (A-Matrix Approach)

As stated earlier, each element \( a_{ij} \) of \( A \) represents the number of units of outputs of service department \( j \) required for each unit of output of service department \( i \). Since the \( A \) matrix is independent of the level of activity in the firm, the model, once developed, can be used for any level of activity. Matrix \( B \), on the other hand, has to be changed whenever the level of activity in the firm changes.

Following Kaplan [1973, page 740], the quantity of outputs of service departments required for a given level of activity in the production departments is expressed by the following relationship:
\[ Q = Q_A + U P \]  
(6)

where \( A \) and \( U \) are defined in the previous section and \( P \) is an \( n \times r \) matrix whose elements \( P_{ij} \) represent the number of units of output of each service department \( j \) needed for every unit of output of the production department \( i \).

Solving for \( Q \) from (6), one obtains

\[ Q = U P [I - A]^{-1} \]  
(7)

where \( I \) is again an \( r \times r \) identity matrix.

The reallocation cost matrix, \( X \), can be written in terms of the \( A \) matrix as \(^2\):

\[ X = Q_A [I - A]^{-1} V \]  
(8)

where \( V \) is an \( r \times 1 \) vector whose \( j \)th element, \( v_j \), represents the unit variable direct cost of the \( j \)th service department.

The allocated costs to the production departments, the \( D \) matrix, can be given as \(^3\):

\[ D = U_A P [I - A]^{-1} V \]  
(9)

In the net approach, (9) can be rewritten as:

\[ D = U_A P [I - A]^{-1} Q_A^{-1} Q_A V = N b \]  
(10)

where

\[ N = U_A P [I - A]^{-1} Q_A^{-1} \]  
(11)

The marginal costs vectors in this representation can be written in the following forms:

\[ M_s = Q_A^{-1} X = [I - A]^{-1} V \]  
(12)

\[ M_p = U_A^{-1} D = P [I - A]^{-1} V \]  
(13)

3. SENSITIVITY ANALYSIS

3.1 Changes in Variable Costs

Managers can analyze effects of changes in variable costs on marginal costs. This information should be useful for planning and budgeting purposes where they want to know cost of providing services if their own and the other divisions' variable costs are expected to change. One can easily develop an If-Then analysis in RCAM approach using an electronic spreadsheet. The following relationships provide new marginal costs (\( M_s' \) and \( M_p' \)) for service departments' outputs and production departments' outputs when variable costs (\( V \) or \( b' \)) are changed in both the representations:

\[ M_s' = (I - A)^{-1} V' \]  
(14a)

\[ = Q_A^{-1} (I - B)^{-1} b' \]  
(14b)

\[ M_p' = P (I - A)^{-1} V' \]  
(15a)

\[ = U_A^{-1} C (I - B)^{-1} b' \]  
(15b)

\(^2\) Since \( B = Q_A A Q_A^{-1} \) and \( b = Q_A V \) as shown by Kaplan [1973, equations (14) and (17), p. 742], \( X = [I - B]^{-1} b \) reduces to \( X = Q_A [I - A]^{-1} V \).

\(^3\) Since \( C = U_A P \) \( Q_A^{-1} \) [Kaplan 1973, equation (15), p. 742], \( D = C X \) reduces to \( D = U_A P [I - A]^{-1} V \).
We consider the example discussed by Baker and Taylor [1979] to illustrate our points. In the example, there are four service departments and two production departments. The following values for various matrices are obtained from their paper.

\[
\begin{bmatrix}
0.00 & 0.24 & 0.15 & 0.05 \\
0.12 & 0.00 & 0.10 & 0.15 \\
0.05 & 0.10 & 0.00 & 0.25 \\
0.08 & 0.06 & 0.04 & 0.00
\end{bmatrix}
\]

\[
\begin{bmatrix}
11.00 & 5.00 & 7.00 & 14.00 \\
5.00 & 4.00 & 7.00 & 5.00
\end{bmatrix}
\]

\[
U = \begin{bmatrix} 1.00 & 2.00 \end{bmatrix}
\]

As evident from Table 2 that an overall change of 10% in \(V\) produces an overall change of 10% in \(M_s\) and \(M_p\) both as expected. However, for a non-uniform change in \(V\), the changes in \(M_s\) and \(M_p\) will be difficult to predict without RCAM. A 10% change in the variable cost of the first service department produces changes of 7.8%, 1.4%, 1.2% and 2.1% in the respective marginal costs of service departments, and changes of 4.4% and 3.7% in marginal costs of production divisions (see Table 2). Such an analysis is not possible with any of the approximate methods.

### TABLE 2

<table>
<thead>
<tr>
<th>(V)</th>
<th>(V')</th>
<th>% Change in (V)</th>
<th>(M_s)</th>
<th>% Change in (M_s)</th>
<th>(M_p^t)</th>
<th>% Change in (M_p^t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>4.4</td>
<td>10.0%</td>
<td>5.589</td>
<td>6.147</td>
<td>10.0%</td>
<td>130.53</td>
</tr>
<tr>
<td>3.0</td>
<td>3.3</td>
<td>10.0</td>
<td>4.261</td>
<td>4.687</td>
<td>10.0</td>
<td>76.27</td>
</tr>
<tr>
<td>2.0</td>
<td>2.2</td>
<td>10.0</td>
<td>3.163</td>
<td>3.479</td>
<td>10.0</td>
<td>-</td>
</tr>
<tr>
<td>1.0</td>
<td>1.1</td>
<td>10.0</td>
<td>1.829</td>
<td>2.012</td>
<td>10.0</td>
<td>-</td>
</tr>
<tr>
<td>4.0</td>
<td>4.4</td>
<td>10.0%</td>
<td>5.589</td>
<td>6.011</td>
<td>7.6%</td>
<td>130.53</td>
</tr>
<tr>
<td>3.0</td>
<td>3.0</td>
<td>0.0</td>
<td>4.261</td>
<td>4.321</td>
<td>1.4</td>
<td>76.27</td>
</tr>
<tr>
<td>2.0</td>
<td>2.0</td>
<td>0.0</td>
<td>3.163</td>
<td>3.200</td>
<td>1.2</td>
<td>-</td>
</tr>
<tr>
<td>1.0</td>
<td>1.0</td>
<td>0.0</td>
<td>1.829</td>
<td>1.868</td>
<td>2.1</td>
<td>-</td>
</tr>
<tr>
<td>4.0</td>
<td>3.6</td>
<td>-10.0%</td>
<td>5.589</td>
<td>5.283</td>
<td>-6.3%</td>
<td>130.53</td>
</tr>
<tr>
<td>3.0</td>
<td>3.0</td>
<td>0.0</td>
<td>4.261</td>
<td>4.302</td>
<td>1.0</td>
<td>76.27</td>
</tr>
<tr>
<td>2.0</td>
<td>2.0</td>
<td>0.0</td>
<td>3.163</td>
<td>3.269</td>
<td>3.4</td>
<td>-</td>
</tr>
<tr>
<td>1.0</td>
<td>1.5</td>
<td>50.0</td>
<td>1.829</td>
<td>2.308</td>
<td>26.2</td>
<td>-</td>
</tr>
</tbody>
</table>

*\(t\) implies that the matrix is transposed.

### 3.2. Changes in Demand of Production Departments' Outputs

Managers of service departments would like to plan their activities based on the demand of their services by the production departments. This information is easily available if RCAM is used. The new level of outputs, \(Q^t\), of service departments with a changed level of activity, \(U^t\), of production departments is given by the following relations (in terms of the \(A\)-matrix):
\( \mathbf{q}' = \mathbf{U}' \mathbf{p} [ \mathbf{I} - \mathbf{A}]^{-1} \) \hspace{1cm} (16)

and (in terms of the \( \mathbf{B} \) - matrix):

\( \mathbf{q}' = \mathbf{U}' \mathbf{u}_{a}^{-1} \mathbf{c} [ \mathbf{I} - \mathbf{B}]^{-1} \mathbf{g}_{a} \) \hspace{1cm} (17)

Consider again the previous example. The quantity of outputs of service departments for a given \( \mathbf{U} \) are obtained by solving equation (7):

<table>
<thead>
<tr>
<th>Table 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \mathbf{U} = \begin{bmatrix} 1.000 \ 2.000 \end{bmatrix} ); ( \mathbf{q} = \begin{bmatrix} 28.366.7 \ 24.915.9 \ 29.204.9 \ 36.456.9 \end{bmatrix} )</td>
</tr>
<tr>
<td>( \mathbf{U}' = \begin{bmatrix} 1.100 \ 2.200 \end{bmatrix} ); ( \mathbf{q}' = \begin{bmatrix} 31.203.4 \ 27.407.5 \ 32.125.4 \ 40.102.6 \end{bmatrix} )</td>
</tr>
<tr>
<td>% Change</td>
</tr>
<tr>
<td>( \mathbf{U} = \begin{bmatrix} 1.000 \ 2.000 \end{bmatrix} ); ( \mathbf{q} = \begin{bmatrix} 28.366.7 \ 24.915.9 \ 29.204.9 \ 36.456.9 \end{bmatrix} )</td>
</tr>
<tr>
<td>( \mathbf{U}' = \begin{bmatrix} 1.100 \ 1.800 \end{bmatrix} ); ( \mathbf{q}' = \begin{bmatrix} 29.802.4 \ 25.984.7 \ 30.303.4 \ 38.363.7 \end{bmatrix} )</td>
</tr>
<tr>
<td>% Change</td>
</tr>
</tbody>
</table>

Here again, as expected, a uniform increase by 10% in the production level of all the departments requires a uniform increase of 10% in all the service departments outputs. For a non-uniform change, it is not so intuitive to obtain the related changes. Using RCAM, it is trivial to analyze these changes as shown in Table 3.

### 3.3. Change in Technology

Effects of technological changes can be analyzed too by RCAM. The main concern of the manager in such a situation would be to determine how his or her output is affected by the change, and thus plan accordingly. The change may be in any department and not necessarily in the manager's department. One can easily analyze such changes by the following relationships:

\( \mathbf{q}' = \mathbf{U}' \mathbf{p}' [ \mathbf{I} - \mathbf{A}]^{-1} \) \hspace{1cm} (18)

where \( \mathbf{p}' \) and \( \mathbf{A}' \) are the new "technological" inputs.

Consider the previous example again and assume that the production department one is planning to upgrade its machine that will require one unit of service less from each service department. The manager of each service department would like to know how its output is affected by the planned improvement. It is a matter of straightforward calculation using an electronic spreadsheet (e.g., Lotus 1-2-3 Rel. 2.0 or 2.01). The results are presented below:

\( \mathbf{p} = \begin{bmatrix} 11.00 \\ 5.00 \\ 7.00 \\ 14.00 \\ 5.00 \\ 4.00 \\ 7.00 \\ 5.00 \end{bmatrix} \)

\( \mathbf{q} = \begin{bmatrix} 28.366.7 \\ 24.915.9 \\ 29.204.9 \\ 36.456.9 \end{bmatrix} \)

\( \mathbf{p}' = \begin{bmatrix} 10.00 \\ 4.00 \\ 6.00 \\ 13.00 \\ 5.00 \\ 4.00 \\ 7.00 \\ 5.00 \end{bmatrix} \)

\( \mathbf{q}' = \begin{bmatrix} 26.972.5 \\ 23.338.1 \\ 27.771.4 \\ 34.792.2 \end{bmatrix} \)
Thus such an analysis should be very useful to the manager for planning purposes.

4. New Demands and Costs Savings when Certain Service Divisions are Closed

The purpose of this section is to demonstrate how information needed by managers for making decisions about discontinuance of certain service departments and acquisition of services from outside can be obtained from RCAM. Although, the general contention is that the firm’s regular accounting records, even if it uses the RCAM, does not contain the information needed to reach a correct managerial decision on the discontinuance of two or more service departments [Capettini and Salamon 1977, p.696; Baker and Taylor 1979, p.784]. Irrespective of this belief, our results show that no additional information is needed besides the information generated by an accounting system of a firm that uses RCAM. We will discuss two separate issues. One about the demand of services when one or more service departments are closed. The other deals with determining the variable cost savings when one or more service divisions are closed.

4.1. New Demands for Services

The initial quantity of service to be generated (when no service departments are eliminated) for a given level of production departments’ demand, \( U_P \), is given by (7). However, when certain service departments are closed, the demands for service by the remaining service departments are reduced while the demands for service by the production departments remain the same since we are assuming no change in output level of activity for the production departments and no change in production technology. The revised demands, \( \mathbf{q}^* \), for services, can be determined by the following relation:

\[
\mathbf{q}^* = \mathbf{q}^* \mathbf{A}^* + U_P
\]

Where \( \mathbf{q}^* \mathbf{A}^* \) represents the revised demands of services by service departments when selected service departments are eliminated and \( \mathbf{A}^* \) is an \( r \times r \) matrix similar to \( \mathbf{A} \) except the elements of the rows corresponding to the service departments that are closed, have zero values. That is

\[
\mathbf{A}^* = [a^*_{ij}]; i = 1, 2, \ldots, r, \text{ and } j = 1, 2, \ldots, r
\]

where \( a^*_{ij} = a_{ij} \) for all \( i \in \{k\} \) (\( \{k\} \) represents the set of service departments that are closed) and \( a_{ij} = 0 \) for all \( i \notin \{k\} \). The relationship between \( \mathbf{A} \) and \( \mathbf{A}^* \) can be written as:

\[
\mathbf{A}^* = \mathbf{A} - \mathbf{T} \mathbf{A}
\]

where \( \mathbf{T} \) is an \( r \times r \) matrix with all elements being zero except those diagonal elements that correspond to the departments that are to be closed. These diagonal elements take unit values. For example, in a firm of three service departments, if the first service department is to be closed, then the matrix \( \mathbf{T} \) will take the following form:

\[
\mathbf{T} = \begin{bmatrix}
1 & 0 & 0 \\
0 & 0 & 0 \\
0 & 0 & 0
\end{bmatrix}
\]

The new demand, \( \mathbf{q}^* \), can be obtained by combining equations (7), (19) and (21):

\[
\mathbf{q}^* = \mathbf{q} [\mathbf{I} - \mathbf{A}] [\mathbf{I} - \mathbf{A} + \mathbf{T} \mathbf{A}]^{-1}
\]
For the $B$ - matrix representation of RCAM, one can express (23) as:

$$Q^* = Q \Delta^{-1} [I - B] [I - B + T B]^{-1} \Delta$$  \hspace{1cm} (24)

where the relationship $B = Q \Delta A \Delta^{-1}$ has been used [Kaplan, 1973, p. 742 equation (14)].

Equations (23) and (24) are extremely useful because they can be used to determine the revised demands of service when one or more service departments are eliminated; no new information must be collected for this purpose since $Q$ and $B$ or $A$ are already present in the cost accounting data and $T$ is based on the specific departments that are to be eliminated. Using equation (23) or (24) for determining new demand, $Q^*$, is a trivial matter in microcomputer environment these days (one can develop macros in Lotus 1-2-3 (Rel. 2.0 or higher) for such calculations, see Srivastava [1989a, 1989b]).

To compare our results with the results of Capettini & Salamon, the numerical example discussed by them is considered here. In this example, the firm has three interacting service departments: water, steam and electric power, and one production department. The proportion of service provided from one service department to the other service departments is given by the matrix $B$:

$$
\begin{bmatrix}
W & S & E \\
0.0 & 0.0 & 0.2 \\
0.6 & 0.0 & 0.0 \\
0.0 & 0.5 & 0.0
\end{bmatrix}
$$  \hspace{1cm} (25)

where $W$, $S$ and $E$ labeling the rows and columns of $B$ stand for water, steam and electric power, respectively.

The outputs of the service departments generated internally for 100,000 units of output of the production department is given as follows:

$$
\begin{bmatrix}
W & S & E \\
150,000 & 180,000 & 600,000
\end{bmatrix}
$$  \hspace{1cm} (26)

where the first element of $Q$ represents the output of water in gallons, the second element represents the output of steam in cu. ft. (cubic feet) and the third element represents the output of power in kwh (kilowatt-hours).

**One Service Department to be Outsourced** - Suppose the electric power department in the above example is eliminated. The amount of water, steam and electric power required can be obtained directly from (24). The $T$ matrix for this case takes the following form:

$$
\begin{bmatrix}
W & S & E \\
0 & 0 & 0 \\
0 & 0 & 1 \\
0 & 0 & 0
\end{bmatrix}
$$

The result is (see Appendix A for details):

$$
\begin{bmatrix}
105,000 & 90,000 & 564,000
\end{bmatrix}
$$  \hspace{1cm} (27)

which is the same result as obtained by Capettini and Salamon.

**Two Service Departments to be Outsourced** - Consider again the above example but this time assume that water and electric power departments are to be closed. The $T$-matrix for this case is:
Using (14), (16) and (19) one obtains the new demand to be (see Appendix A for details):

\[
Q^* = \begin{bmatrix} 105.000 & 90.000 & 480.000 \end{bmatrix}
\]  

which is the same result as obtained by Capettini and Salamon through an alternative, less direct approach.

4.2. Avoidable Variable Costs and Variable Costs Savings

The variable costs that can be avoided when a set of service departments are closed can be given by:

\[
\text{Avoidable variable costs (AVC)} = \sum_{j} (q_j - q^*_j) v_j + \sum_{k} q_k v_k
\]  

where \( v_j \) represents the traceable variable cost per unit of output of the \( j \)th service department as defined earlier. The first term in (29) represents the variable costs that can be avoided due to the decrease in the demand for the outputs of the service departments that are not eliminated. The summation in this term is over only the service departments that are considered to be staying in operation. The second term represents the variable costs that can be avoided when the set of \( \{k\} \) service departments are closed. The summation in this term is over only the service departments that are being considered for closing.

As demonstrated in Appendix B, the expression in (29) can be rewritten as

\[
\text{AVC} = Q^* T M_s = \sum_{k} q^*_k m_k - \sum_{k} q^*_k (x_k, q_k)
\]  

where \( m_k \) is the \( k \)th element of the marginal cost vector, \( M_s \), defined earlier. The summation in (30) is over all the service departments that are considered for closing.

The variable costs that can be saved, if the services are to be purchased externally, can be determined now by subtracting the cost of purchasing the services externally from the avoidable variable cost:

\[
\text{Variable cost saving (VCS)} = \sum_{k} [q^*_k m_k - q^*_k p_k] = \sum_{k} q^*_k [m_k - p_k]
\]

\[
= Q^* T [M_s - p]
\]  

where \( p \) is an \( r \times 1 \) matrix with each element representing the external unit price for the output of the various service departments. When the external unit prices are available only for the services that are to be closed then one can input zeroes for the rest of the elements of \( p \) in (31) since the matrix \( T \) selects only those elements that relate to the services being considered for discontinuance.

Equation (31) is an interesting result because it provides information about the amount of variable cost saving if certain service departments are closed. It is apparent from (31) that when the marginal cost of producing a service internally is greater than the external purchase price, then the firm will benefit from purchasing the service externally. The total expected
variable cost saving when a set of \{k\} service departments are eliminated is given by (31).

As mentioned earlier, the information about the marginal cost of producing a service internally is already available from the regular cost accounting data of the firm if it has used the RCAM for cost allocation. The revised demands, \(Q^*\), of the services can be also determined directly from the regular cost data. Thus, contrary to the Capettini and Salamon finding, our study shows that the information produced by a firm's regular cost accounting records, if it uses the RCAM for allocating the variable costs of service departments, does contain the information needed to reach a correct managerial decision on the discontinuance of even two or more service departments. To directly compare our results with those of Capettini and Salamon, the following two special cases are considered.

**Single Service Department Discontinuance** - When only one service department is under consideration for discontinuance, the avoidable variable cost expression from (30) takes the following form

\[
AVC = q_k^* m_k = q_k^* (x_k/q_k) \tag{32}
\]

where \(k\) stands for the \(k\)th service department to be eliminated. However, one knows that [see Kaplan, 1982, p.370]

\[
q_k^* / q_k = 1 / [1 - B_{kk}]^{-1}
\]

Therefore, (32) becomes:

\[
AVC = x_k / [I - B]_{kk}^{-1} \tag{33}
\]

Equation (33) implies that, in a single service department discontinuance, the avoidable variable cost is obtained by dividing the "reallocated" variable cost to the service department by the corresponding diagonal element of the \([I-B]^{-1}\) matrix. This is exactly what Capettini and Salamon concluded for this case, but without a formal proof.

**Two Service Department Discontinuance** - Consider eliminating two service departments: water and electric power in the example presented earlier. From (30), the avoidable variable cost expression for this case is:

\[
AVC = q_w^* m_w + q_e^* m_e \tag{34}
\]

where \(q_w^*\) and \(q_e^*\) are the new demands of water and electric power, respectively, when the two service departments are closed. \(m_w\) and \(m_e\) represent the marginal costs of producing water and electric power by the respective departments. For our example, the new demand vector is given by (20):

\[
\begin{bmatrix}
W \\
S \\
E
\end{bmatrix}^* = [105,000 \\
90,000 \\
480,000]
\tag{35}
\]

and the marginal cost vector as (see Kaplan 1973, page 741):

\[
M_s = (1/0.94)(1/3000)\begin{bmatrix}
100 \\
332 \\
78
\end{bmatrix}
\tag{36}
\]

Thus, using (34)-(36), the avoidable variable cost is determined to be

\[
AVC = \left(105,000)(.03546) + (480,000)(.02766) = 17,000
\]

This is what Capettini and Salamon obtained through an alternative approach. Thus, RCAM does provide the information necessary to make outsourcing (make-or-buy) decisions for reciprocally related services even when two or more service departments are to be considered.
5. Summary and Conclusion

The paper has reinvestigated two forms of reciprocal cost allocation model (RCAM), one based on proportion-of-output services (B-Model) and the other based on technological factors (A-Model). General relationships among various quantities of interest for managerial decisions have been derived in matrix forms. These relationships have been used to perform various sensitivity analyses as mentioned in the introduction. Also, we have investigated the application of RCAM for making economic decisions regarding closing certain service departments and purchasing the services from outside. It is interesting to note that the information produced by a firm's regular cost accounting records, if it uses the RCAM for allocating the variable costs of service departments, does contain the information needed to reach a correct managerial decision on the discontinuance of one or more than one service department. In fact, the manager needs to know only the marginal cost of producing a service in relation to the external unit cost of the service. If the marginal cost provided by the model is higher than the external unit cost, then the firm will benefit by purchasing the service externally. It should be emphasized that with the availability of electronic spreadsheets like Lotus 1-2-3 (Rel. 2.0 or higher) or Excel, application of RCAM is now a trivial task for various analyses [Srivastava and Chandra, 1991, Srivastava, 1991]. Thus, it seems unnecessary to develop an approximation to RCAM when RCAM provides much more information for managerial decisions than available from such an approximation [e.g., Jacobs and Marshall, 1987].

References


APPENDIX A

(a) Matrices Used in One Department Being Outsourced (Section 4.1)

\[ Q = \begin{bmatrix} 150.000 & 180.000 & 600.000 \end{bmatrix} \]

\[ Q_\delta = \begin{bmatrix} 0 & 0 & 0.0067 \\ 0 & 0.0056 & 0 \\ 0 & 0 & 0.0017 \end{bmatrix} \]

\[ B = \begin{bmatrix} 0 & 0.2 \\ 0.6 & 0 \\ 0.5 & 0 \end{bmatrix}; \quad T = \begin{bmatrix} 0 & 0 \\ 0 & 0.5 \\ 0 & 1 \end{bmatrix}; \quad TB = \begin{bmatrix} 0 & 0 \\ 0.5 & 0 \end{bmatrix} \]

\[ [I - B + TB]^{-1} = \begin{bmatrix} 1 & 0 & 0.2 \\ -0.6 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}; \quad [I - B + TB]^{-1} = \begin{bmatrix} 1 & 0 & 0.2 \\ 0.6 & 1 & 0.12 \\ 0 & 0 & 1 \end{bmatrix} \]

(b) Matrices Used in Two Departments Being Outsourced (Section 4.1)

\[ T = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}; \quad TB = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0.5 \\ 0 & 0 & 0 \end{bmatrix} \]

\[ [I - B + TB]^{-1} = \begin{bmatrix} 1 & 0 \\ 0.6 & 1 \\ 0 & 1 \end{bmatrix}; \quad [I - B + TB]^{-1} = \begin{bmatrix} 1 & 0 \\ 0.6 & 1 \\ 0 & 1 \end{bmatrix} \]

APPENDIX B

From (29)

\[ AVC = \sum_{j \in \{k\}}^{r} (q_j - q_j^*) v_j + \sum_{j \in \{k\}} q_k v_k \]

or

\[ AVC = \sum_{j \in \{k\}}^{r} (q_j - q_j^*) v_j + \sum_{j \in \{k\}} q_k^* v_k \]

In terms of matrices, one can write (B-1) as

\[ AVC = [g - g^*] V + g^* T V \] (B-2)

or

\[ AVC = g V - g^* V + g^* T V \] (B-3)

From equation (23)

\[ g^* = g [I - A] [I - A + TA]^{-1} \]
or
\[ g = g^* (I - A + TA)(I - A)^{-1} \]
\[ = g^* + g^* TA (I - A)^{-1} \]
or
\[ gV = g^* V + g^* TA (I - A)^{-1} V \]  \hspace{1cm} (B-4)

Also from (14)
\[ V = (I - A) M_a \]  \hspace{1cm} (B-5)

Thus, combining (B-3), (B-4) and (B-5), one can write
\[ AVC = g^* T M_a \]  \hspace{1cm} (B-6)

which then can be written as
\[ AVC = \sum_{\{k\}} q^*_k m_k \]  \hspace{1cm} (B-7)

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**Congratulations**

Dr. Bhabatosh Banerjee, Chief Editor, Indian Journal of Accounting and former President, Indian Accounting Association, has been nominated Vice-President of the International Association for Accounting Education and Research (IAAER) with effect from 1 January, 1993 until Autumn, 1997.

Our heartiest congratulations to Dr. Banerjee.

*Associate Editors*
HUMAN RESOURCE ACCOUNTING IN INDIA - A PERSPECTIVE & APPRAISAL

G. S. BATRA*

B. S. BHATIA**

While dealing with Human Resource Accounting, the authors conclude that very few enterprises in India value their human resources and report this information in the annual accounts.

1. Introduction

In any organisation the most important input is the human element. The success or failure of a company very much depends on the persons who man the organisation. It is a matter of common knowledge that capital issues of even new undertakings are oversubscribed, if they are floated by competent persons. This is because the investor in the capital market places high value in the human ability rather than any other factors like net worth, yield, price earnings ratio which are not available in the case of a new company. Even among nations, countries like Japan, Germany and Korea are able to make rapid strides – thanks to the human resources – not in terms of numbers but in terms of quality, devotion to work and loyalty to the nation. History is replete with examples of several great personalities like Christ, Buddha, prophet Mohammed, Sankara and Vivekananda that makes us realise what a single individual can achieve without any material resources. In business also, the greatest asset is the human resource of the enterprise and not the plant, equipment or the magnificent buildings it owns. It is worth recalling what Alfred Marshall said long ago that ‘the most valuable of all capital is that invested in human beings’. However, it is unfortunate that the balance sheets do not exhibit this most vital asset, while capital invested in other assets is shown. This is one of the severe limitations of present-day financial statements which hinders the user of these statements from making full use of them.

Generally, the productivity of investment in industries is known from the rate of return it gives. So far, these rates of productivity are considered in respect of physical assets investment only. To find out the productivity of investment in respect of human beings in any enterprises, Human Resource Accounting (HRA) will be helpful. Human Resource Accounting is also the scaling tool that generates reports/quantitative control information about the contribution of human resources for promoting industrial productivity. It can help management in taking many vital decisions relating to selection, lay-off, transfer, training, promotion, etc.

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The American Accounting Association's Committee on Human Resource Accounting has defined human resources accounting as under:

"Human resource accounting is the process of identifying and measuring data about human resource and communicating this information to the interested parties".

Thus, the basic premises underlying the theory of HRA are:

1. People are valuable resources of an enterprise.
2. The usefulness of manpower as an organisational resource is determined by the way in which it is managed.
3. Information on investment and value of human resources is useful for decision making in the enterprise.

The purpose of HRA is to improve the quality of human resource decisions made, both internally and externally, concerning an organisation. However, the specific objectives of HRA may be outlined as under:

1. to assist management in taking suitable decisions regarding investment in human resources;
2. to provide information to all people concerned regarding the earning potential of human resources of the organisation;
3. to assess the efficiency of human resources in obtaining productivity and profitability; and
4. to provide comparative information regarding costs and benefits associated with investment in human assets.

2. Rationale of Human Resource Accounting

The accountants in the past have not given due consideration to this important asset working in the enterprise. In our traditional accounting practices, the heavy amount incurred on the recruitment, placement, selection, training and development of the personnel is generally treated as revenue expenditure and hence it is debited to profit and loss account of the period during which such amount is incurred. But today, it is argued that these expenditures incurred by an enterprise to get the benefit of the services of its manpower force in future is against the accounting principle to treat them completely of a revenue nature. In fact, such expenditure should be capitalised and shown in the balance-sheet. The failure of professional accountants to treat human resources as assets just like physical and financial assets attracted the attention of academics, and in the seventies, the concept of HRA was evolved to emphasise that human resources should be treated like physical assets and should be shown on the balance sheet of the enterprise.

The primary purpose of human resource accounting is to facilitate the management of people as organisational resources. It can also be called human resource management accounting, i.e., the application of accounting to the management of human resources.

Rensis Likert, one of the earliest proponents of the subject, has listed the following as the objectives of Human Resource Accounting:

1. To furnish cost value information for making management decision and maintaining human resources in order to attain cost effective organisational objectives.
2. To allow management personnel to monitor effectively the use of human resources.
3. To provide a sound and effective basis for asset control i.e., whether assets are conserved, depleted or appropriated.
4. To aid the development of management principles by classifying the financial consequences of various practices.

3. Human Resource Accounting: a Few Models

(a) Present Value of Future Earning Model

Until now there have been different approaches for the valuation of human resources as an asset. One such approach is the Present value of Future Earning Model. According to this approach, the value of human resources of an organisation is determined according to their present value to the organisation. A number of valuation models have been developed to determine the present value.

This model has been developed by Baruch Lev and Aba Schwartz in 1971. They are of the opinion that determination of the total value of a firm’s labour force is a straightforward extension of the measurement procedure of an individual value to the organisation. They have divided the whole labour force into certain homogeneous group such as skilled, unskilled, semi-skilled, technical staff, managerial staff etc. and in accordance with different classes and age groups. Average earnings stream for different classes and age groups are prepared for each group separately and the present value for the human capital is calculated. The aggregate present value of different groups represents the capitalised future earnings of the firm as a whole. They have advocated the use of cost of capital rate for the purpose of capitalising the present value of the future earnings of the employees. According to them, the value of human capital represented by a person of age \( r \) is the present value of remaining future earnings from his employment. They have given the following formula for calculating the value of an individual:

\[
V_r = \frac{1(t)}{(1 + R)^{t-r}}
\]

where

- \( V_r \) = the value of an individual \( r \) years old
- \( 1(t) \) = the individuals annual earnings upto the retirement
- \( t = \) retirement age
- \( R = \) a discount rate

(b) Rewards Valuation Model

This model has been suggested by Flamholtz. It identifies the major variables that determine an individual’s value to an organisation, i.e., his expected realisable value. The expected realisable value of an individual is the present worth of future services expected to be provided during the period he is expected to remain in the organisation. The model is based on the presumption that a person’s value to an organisation depends upon the positions to be occupied by him in the organisation. The movement of people from one organisation role to another is a stochastic process with rewards. As people move and occupy different organisational roles, they render services (i.e. rewards) to the organisation. However, the roles they will
occupy in future will have to be determined probabilistically for each individual. The model suggests a five-step approach for assessing the value of an individual to the organisation, viz:

1. Forecasting the period he will remain in the organisation, i.e. his expected service life.
2. Identifying the service states, i.e., the role that he might play including, of course, the point of time at which he will leave organisation.
3. Estimating the value derived by the organisation when a person occupies a particular position for a specified time period.
4. Estimation of the probability of occupying each possible mutually exclusive state at specified future times.
5. Discounting the value at a predetermined rate to get the present value of human resources.

This model is certainly an improvement over the Lev and Schwartz model. But this model, when examined on grounds of operational capacity, falls short of a practical value inasmuch as the probabilities will have to be determined for each individual occupying various service states, and these probabilities will have to be determined for all employees for n periods on an individual basis. Further, it will be tremendously expensive to predict career movements and exit probabilities on an individual basis. Moreover, data developed on this basis will involve a large variance which will reduce usefulness of the model.

(c) Net Benefit Model

Morse (1973) suggested that the value of human resources is equivalent to the present value of the net benefits derived by the enterprise from the services of its employees. The following steps are involved under this approach, viz:

1. Determination of the gross value of the services to be rendered in future by the employees in their individual and collective capacity.
2. Determination of the value of direct and indirect future payments to be made to the employees of the organisation.
3. Estimation of the excess of the value of future human resources (as per 1 above) over the value of future payment (as per 2 above), representing the net benefit to the enterprise because of the employment of human resources.
4. Determination of the present value of human resources to the enterprise by applying a predetermined discount rate (usually the cost of capital) to the net benefit.

(d) Certainty Equivalent Net Benefit Model

This approach, as suggested by Pekin Ogan (1976), is in fact an extension of net benefit approach of Morse. Here, the value of human resources is determined by taking into consideration the certainty with which the net benefits in future will accrue to the enterprise. The method involves the following steps:
(a) Estimation of net benefit from each employee as is determined under the previous approach;
(b) Selection of certainty factor at which the benefits will be available in future;
(c) Calculation of certainty equivalent benefits by multiplying the certainty factor with the net benefits accruing from all employees, representing the value of human resources of the enterprise for inclusion in the balance sheet.

4. Accounting Standards in India Relating to HRA

Though the ASB of the ICAI has brought out 12 accounting standards on most of the important areas in accounting and has ensured their implementation by making them mandatory, the most regrettable fact is that the ICAI has not been able to bring any definitive accounting standard on measurement and reporting of cost and value of human resources. The nondisclosure of human resources accounting information in financial statements distorts net income disclosed by profit and loss account, total assets figure shown in balance sheet and the computation of the rate of return on capital employed, because its components, namely, net income and total assets, are distorted.

5. Application of Human Resource Accounting in India

If we look at the annual reports of public enterprises and private enterprises in India, we find that the chairman's report invariably contains the statements highlighting the significance of human resources. The chairmen of these enterprises, at the annual general meeting of the shareholders, remark that our employees are the most important asset and without their significant contribution, the present growth in the operation would not have been attained. 'I wish to place it on record of my sincere gratitude for the hard work done by the employees of our company' : 'I thankfully acknowledge the contribution made by our employees'—these qualitative pronouncements reflect the importance of human resources in an enterprise but the quantitative information relating to their contribution or their value is nowhere recorded or shown in the financial accounts.

However, in practice, a few enterprises, belonging both to the public and private sectors, value their human resources and report this information in their annual reports.

(a) Public sector enterprises comprise:
1. Bharat Heavy Electricals Ltd..
2. Cement Corporation of India.
3. Project and Equipment Corporation of India.
4. Engineers India Ltd..
5. Minerals and Metals Trading Corporation of India.
6. Electrical India Ltd..
7. Oil and Natural Gas Commission.
8. Hindustan Shipyard Ltd..
9. Steel Authority of India Ltd..
10. Oil India Ltd.
(b) Private sector enterprises include:

1. Tata Engineering and Locomotive Works (TELCO).
2. The Associated Cement Company (ACC).

A glance at Table-1 given at the end of this paper makes it abundantly clear that a majority of the organisations which publish such information use the Lev and Schwartz model of economic value. The pioneer in the field is BHEL which experimented with this concept in 1974-75 and is still using the same mode. But SAIL and CCI prominently highlight in their annual reports that they have used:

(i) the Lev and Schwartz Model after incorporating "certain refinements as suggested by Eric Flamholtz and Jaggi & Lau";
(ii) the economic models developed by Lev and Schwartz (1971), Eric Flamholtz (1974) and Jaggi & Lau (1974) with appropriate modifications.

Many companies such as BHEL do not consider labour as a cost but as a resource: and in valuing this asset the 'Lev and Schwartz' model is mostly adopted. In the process they take into consideration the factors such as:

a) present pattern in employee compensation including direct benefits incorporating the effect of wage revision;

b) normal career growth as per the present policies, with vacancies filled from the levels immediately below;

c) weightage to be given for changes in efficiency due to age, experience and skills of the employees;

d) a discount factor of 12 per cent per annum on the future earnings to arrive at the present value.

BHEL has adopted Lev-Schwartz present value model. According to this method, the value of human resources is taken as the present value of estimated future earnings of employees discounted by the rate of return on investment (cost of capital): and applying employee group-wise weights for the firm. For this, the value of future services of an employee is estimated in terms of wages and salaries. The period for which the employee will be with the firm is also taken into consideration.

6. Emerging Issues

It may be emphasised that human resource accounting clearly encompasses such elements as:

(a) the composition of employees in different grades for five years;

(b) productivity of human resources for five years;

(c) programmes for employee development;

(d) personnel payments to the employees and expenses on social welfare per employee;

(e) human asset valuation;

(f) human assets vis-a-vis total assets;

(g) value of human assets in an organisation, etc.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Company</th>
<th>Publishing HRA Information since</th>
<th>Model</th>
<th>Discount Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Oil &amp; Natural Gas Commission (ONGC)</td>
<td>1981-82</td>
<td>Not Reported</td>
<td>11.25%</td>
</tr>
<tr>
<td>2.</td>
<td>Engineers India Ltd. (EIL)</td>
<td>1980-81</td>
<td>Not Reported</td>
<td>10%</td>
</tr>
<tr>
<td>3.</td>
<td>National Thermal Power Corporation Ltd. (NTPC)</td>
<td>1986-87</td>
<td>Lev and Schwartz</td>
<td>12%</td>
</tr>
<tr>
<td>4.</td>
<td>Minerals and Metals Trading Corporation of India Ltd. (MMTC)</td>
<td>1983-84</td>
<td>Lev and Schwartz</td>
<td>12%</td>
</tr>
<tr>
<td>5.</td>
<td>Bharat Heavy Electricals Limited (BHEL)</td>
<td>1974-75</td>
<td>Lev and Schwartz</td>
<td>12%</td>
</tr>
<tr>
<td>6.</td>
<td>Steel Authority of India Ltd. (SAIL)</td>
<td>1983-84</td>
<td>Lev &amp; Schwartz with refinements as suggested by Flamholtz and Jaggi &amp; Lau.</td>
<td>14%</td>
</tr>
<tr>
<td>7.</td>
<td>Cement Corporation of India Ltd. (CCI)</td>
<td>1980-81</td>
<td>---do---</td>
<td>15%</td>
</tr>
<tr>
<td>8.</td>
<td>Madras Refineries Ltd. (MRL)</td>
<td>1985-86</td>
<td>Lev and Schwartz</td>
<td>15%</td>
</tr>
<tr>
<td>9.</td>
<td>Metallurgical and Engineering Consultants (India) Ltd. (MECON)</td>
<td>1984-85</td>
<td>Lev and Schwartz</td>
<td>14%</td>
</tr>
<tr>
<td>10.</td>
<td>Oil India Ltd. (OIL)</td>
<td>1984-85</td>
<td>Lev and Schwartz</td>
<td>10.5%</td>
</tr>
<tr>
<td>11.</td>
<td>Associated Cement Companies Ltd. (ACC)</td>
<td>1983-84</td>
<td>---do---</td>
<td>Not Reported</td>
</tr>
<tr>
<td>12.</td>
<td>Southern Petro-chemicals Industries Corporation (SPIC)</td>
<td>1983-84</td>
<td>Lev and Schwartz</td>
<td>Not Reported</td>
</tr>
</tbody>
</table>

Source: Annual Reports of various companies in public and private sector.
In India, human resource accounting until now has not been introduced as a system. So far as the statutory requirement is concerned, the Companies Act, 1956, does not require furnishing of any significant information about human resources in financial statements of companies. The Institute of Chartered Accountants of India, too, have not issued an accounting standard for measurement and reporting of cost and value of human resources of an organisation. Implicitly, however, the existing accounting standards, in the absence of any negative directive, may be seen to support the adoption of human resource accounting by an organisation for the purpose of meeting its own requirements. In consequence, HRA has become a sparingly implemented practice in the corporate sector in India. The result of non-disclosure of human resources cost and value information in financial statements of business enterprises has been that financial statements do not reveal any quantitative information on human resources and the state of affairs is improperly reported to different authorities.

The dichotomy in accounting between human and non-human capital is rather fundamental in that, while the latter is recognised as an asset and recorded as such in the financial statements, the former is totally ignored. With the accelerated growth in science and technology, the value of human capital is gradually increasing and hence it is essential for a company to reflect the investment in human resources.

The application and usefulness of HRA depends on the future efforts and experiments to be made by practising managers, accountants and academicians. It also needs support from the professional bodies and government. In the absence of HRA the management may not realise the negative effects of certain programmes aimed at improving profits in the short run. Such programmes may result in decreased value of human assets due to fall in the productivity levels, high labour turnover, low morale, etc.

The success of an organisation very much depends on the build-up quality workforce at all levels. The success stories of BHEL, ITC, Hindustan Lever, Larsen & Toubro and several other enterprises are largely due to their emphasis on human resource development. To the extent this vital asset is not shown in the balance sheet, the public and investors are handicapped. Human resource accounting helps investors and the public by providing the necessary information.

References

THE DETECTION OF IRREGULARITIES BY AUDITORS: A ROUGH SET APPROACH

Philip Siegel*
Andre de Korvin*
Khursheed Omer*

The paper presents an approach to the detection of irregularities which takes into account the important fact that auditors have the arduous task of knowledge acquisition under uncertainty. We show how knowledge acquired through examples could serve as a basis of establishing rules for detecting irregularities. We also develop measures of how much trust could be placed on these rules. As the number of examples grow through experience, the rules become more reasonable and can be utilized in practice and in development of expert systems for the detection of irregularities.

I. Introduction

Auditors have historically been held responsible for client fraud and irregularities. Up until the late 1800s, the primary purpose of an audit was to detect fraud and to assess the stewardship of the managers for the owners (Chatfield 1977). As the needs of various users of financial reports became the focus of financial reporting, the emphasis of auditing shifted from detection of frauds to true and fair presentation of financial information. In the wake of landmark court decisions in Ultramares, McKesson & Robbins, Bar Chris, Westec, Yale Express, and Continental Vending, further changes were made in the process of audit examination and the wording of the auditor’s report to expand the scope of audit.

These changes were made in recognition of the fact that the responsibility for fraud and irregularities rested with management and that the auditors were only responsible for these acts if they failed to adhere to Generally Accepted Auditing Standards (GAAS) or knowingly misrepresented material facts with intent to mislead and reckless disregard of truth. The objective of these changes was to seek protection for the auditor from undue legal liability. However, societal interest in the responsibility of the auditors for frauds and irregularities has continued and has been on the rise in recent years due to highly publicized cases of business failures and questionable accounting practices (Guy et al. 1990).

In order to address the issues raised by these concerns, the US House

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of Representatives has had a series of hearings on the accounting profession which led to the formation of the National Commission on Fraudulent Financial Reporting in 1985. In its final report issued in October 1987, the Commission was especially critical of the accounting profession because of its inability to come up with an affirmative obligation to detect fraud in clear and non-defensive language. The Auditing Standards Board responded to the Commission's criticism by issuing SAS No. 53, *The Auditor's Responsibility to Detect and Report Errors and Irregularities*, and SAS No. 54, *Illegal Acts by Clients*.

SAS No. 53 (AU 316.05) requires the auditors to (1) assess the risk that errors and irregularities might cause the financial statements to contain material misstatements, and (2) to design the audit to provide reasonable assurance that errors and irregularities material to the financial statements will be detected. While the issuance of these standards purportedly addresses the public's concern about the perceived inaction of the profession on detecting frauds, the standards do little more than provide detailed procedural guidelines for the specific task of detecting fraud or irregularity.

SAS No. 54 (AU 316.07) states that an auditor is neither required nor trained to authenticate documents. Furthermore, it points out that even a properly designed and executed audit may not detect a material irregularity because of the complex interaction among different characteristics of the irregularity. As discussed in SAS No. 53 (AU 316.34), these characteristics are:

1) materiality - irregularities could be immaterial with little effect on financial statements, or could be large enough to affect the financial statements.
2) level of involvement - irregularities may be caused by employees, lower management, or senior management.
3) concealment - irregularities may be concealed skillfully, or clumsily and on a limited basis.
4) internal control structure - irregularities may occur repeatedly and may accumulate to a material amount due to a lack of control procedures, or due to weak controls that allow circumvention of the controls.
5) financial statement effects - irregularities may involve overstatement or understatement in financial statement amounts and may either be charged to the income statement or concealed in the balance sheet.

The foregoing characteristics represent symptoms upon which the auditors must base their final diagnosis of the situation and assess the audit risk of material misstatements in the financial statements. It should be noted that these symptoms are not defined in crisp or precise terms. In other words, these symptoms are 'fuzzy'. Fuzziness refers to a state where inexact knowledge about the state of the system is caused by the usage of imprecise terms such as "large", "material", "immaterial", etc. Any diagnosis based upon these fuzzy symptoms must be fuzzy as well. Detection of irregularities is, therefore, problematic.

* For the purpose of this paper the terms irregularity and fraud are used interchangeably.
The purpose of this paper is to present a methodology designed to extract fuzzy rules under uncertainty and to extract rules to measure the degree of belief in those fuzzy rules. Such a methodology will help auditors define their diagnosis of the situation in terms of the observed symptoms and would pave the way for development of an expert system in this crucial area of auditing. The next section outlines the background literature devoted to the study of knowledge acquisition under uncertainty. The following section develops a model for extracting rules from fuzzy symptoms and fuzzy diagnosis that will aid the auditor in the detection of irregularities. The final section presents a summary of the article.

2. Literature Review

The notion of uncertainty has been extensively studied in numerous disciplines such as psychology, economics, and the behavioral sciences. It may be caused by the ambiguity in the terms used to describe a specific situation; it may be caused by skepticism of the rule used to describe a situation, or by missing and/or erroneous data. The problem of ambiguity has been acknowledged in accounting literature since at least the early 1960s. Vatter (1963) attributed the complexity of an accountant's task to the vague specification of the demands placed on the position of his/her position. Ijiri and Jaedicke (1966) noted that the 'usefulness' criterion in accounting was highly ambiguous. Duvall (1967), Kaplan (1969), and Horngren (1982) have all indicated that due to imprecise data, precise judgment in the area of cost control is not possible. Demski (1980) points out that information possessed by others within an organization and about their probable actions is also a source of uncertainty and ambiguity.

Inasmuch as auditing involves the collection and interpretation of evidence and requires judgments or series of judgments by the auditor resulting in actions (e.g., communications to interested parties) it is particularly exposed to the problems posed by ambiguity. Maher (1981), Mock and Turner (1981), Biggs (1985), Ashton (1991), and Spires (1991) have pointed out the problems posed by ambiguity in different auditing contexts.

The Bayesian decision theory has been suggested in recent auditing literature as a possible basis for improving the auditor's effectiveness. However, as Akresh, et al. (1988) observe, Bayesian approaches do not seem to be formally practiced because the theory itself may not be valid under the complex auditing environment. Under the Bayesian approach to decision making, the auditor is forced to apply his judgment by further defining the symptoms to the point where the concepts become well defined. Cooley and Hicks (1983) have also criticized the traditional approaches of reliability modeling. They contend that the numbers generated by these models can be misleading because of the imprecision of the underlying variables.

Another problem with the statistical solutions to decision making is the need to estimate probabilities, sometimes even without recourse to relative frequencies (de Korvin, et al. 1991). These estimates are typically quite inaccurate. Other approaches have, therefore, been suggested in the literature that allow for situations where the decision maker, when faced with fuzzy (i.e. uncertain) symptoms, makes a decision which may be strongly
or weakly based upon these symptoms. Einhorn and Hogarth (1981), Cooley and Hicks (1983), Dacy and Ward (1984), Gibbins (1984), Larson and Chesley (1986), and Shafer and Srivastava (1986, 1988) provide examples of these alternative approaches.

Among these approaches, the Dempster-Shafer theory of evidence which is a natural extension of probability theory has gained popularity in the field of artificial intelligence due to the fact that it gives useful measures for the evaluation of subjective certainty. Works using the Dempster-Shafer theory include Kleye and de Korvin (1989), de Korvin, et. al (1990), and Strat (1990).

In dealing with the problems of ambiguity, a considerable amount of work has been based upon the fuzzy set theory proposed by Zadeh (1965, 1975, 1978). For example, see Gaines and Kohout (1977), Kandel and Yager (1978), and Zadeh (1979, 1981, 1983). More recently, the rough set theory has been used dealing with problems posed by ambiguity. Rough set theory deals with knowledge acquisition based on learning from examples and has found numerous applications in the fields of medicine and industrial manufacturing [for example, see Mrozek (1985), Arciszewski and Ziarko (1986) and Pawlak (1981, 1983)]. The methodology for inference under the rough set theory has been described in some detail by Grzymala-Busse (1988). In their work, the values of the attributes are crisp, as is the diagnosis of a particular condition.

However, as noted earlier, the detection of fraud and irregularities during an audit represents a situation in which the values of attributes is not crisp and require some judgment in their determination. When an auditor is faced with fuzzy (uncertain) symptoms, any diagnosis based upon these symptoms is also fuzzy. Thus, auditors may construct a rule such as "if internal control is somewhat weak, then the presence of irregularities is somewhat likely" rather than construct a rule which expresses the magnitude of fraud and a precise number expressing its probability. The auditor's diagnosis is likely to be in the form of $0.3D_{NF} + 0.6D_{F}$, which means that the auditor believes the fuzzy symptoms to reflect no fraud (NF) with the strength of 0.3 and fraud (F) with the strength of 0.6.

3. Extracting Fuzzy Rules under Uncertainty Using Rough Set Theory

In this section, a model for extracting rules from fuzzy symptoms and fuzzy diagnosis is developed. Two sets of rules are extracted. The first set of rules represents certain and possible rules and the second set represents rules to measure the degree of belief in the certain and possible rules. A related problem is defining the diagnosis in terms of the symptoms. For this purpose, it is important to understand the relationship between the prevailing symptoms observed during the course of an audit by the auditor and possible cases of fraud or irregularity. Some basic notations and concepts of rough set theory as discussed in de Korvin, et al. (1991) are reproduced in appendix 1. A
A simplified example is presented below to demonstrate extraction of certain and possible rules from raw data. Consider the following table:

<table>
<thead>
<tr>
<th>Situations</th>
<th>Materiality</th>
<th>Internal Control</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>x₁</td>
<td>.8/M + .4/N</td>
<td>.3/S + .7/W</td>
<td>.8/F + .3/NF</td>
</tr>
<tr>
<td>x₂</td>
<td>.7/M + .3/N</td>
<td>.2/S + .9/W</td>
<td>.8/F + .4/NF</td>
</tr>
<tr>
<td>x₃</td>
<td>.9/M + .2/N</td>
<td>.4/S + .8/W</td>
<td>.7/F + .2/NF</td>
</tr>
<tr>
<td>x₄</td>
<td>.3/M + .8/N</td>
<td>.9/S + .4/W</td>
<td>.3/F + .8/NF</td>
</tr>
<tr>
<td>x₅</td>
<td>.2/M + .7/N</td>
<td>.8/S + .3/W</td>
<td>.4/F + .7/NF</td>
</tr>
<tr>
<td>x₆</td>
<td>.7/M + .4/N</td>
<td>.9/S + .2/W</td>
<td>.8/F + .4/NF</td>
</tr>
<tr>
<td>x₇</td>
<td>.8/M + .2/N</td>
<td>.8/S + .4/W</td>
<td>.4/F + .7/NF</td>
</tr>
</tbody>
</table>

Cases x₁ - x₇ denote seven audit situations. For the sake of parsimony, only two characteristics symptoms of possible irregularity, materiality and internal control structure, with dichotomous value are considered in this example. The symbols M and N stand for material and not material and symbols S and W stand for strong and weak internal control structure. Situation x₁ is judged to be .8 material and .4 not material and the internal control structure in this situation is judged to be .3 strong and .7 weak. These numbers could represent relative frequencies if this was a situation where a number of auditors were examining the situation and some of the auditors judged the situation to be fraudulent while others judged it to be non-fraudulent. However, these numbers need not be generated as relative frequencies and could merely represent a fuzzy diagnosis by the auditor(s). The fuzzy diagnosis in case x₁ can be interpreted as follows. Situation x₁ is deemed to be fraudulent and the degree of belief in this diagnosis has a strength of 0.8. Also, situation x₁ is deemed to be non-fraudulent and the degree of belief in this diagnosis has a strength of 0.3.

These seven situations can be expressed in terms of fuzzy rules as to when the situation is fraudulent and when it is not. From the above data, F can be represented as a fuzzy set of situations which could be viewed as good or bad examples of F:

\[ F = .8/x₁ + .8/x₂ + .7/x₃ + .3/x₄ + .4/x₅ + .6/x₆ + .4/x₇ \]  \[ (1) \]

Obviously (1) shows that x₂ is a good example of F while x₄ is not such a good example of F. Similarly fuzzy sets for the characteristic symptoms can be defined as follows:

\[ M = .8/x₁ + .7/x₂ + .9/x₃ + .3/x₄ + .2/x₅ + .7/x₆ + .8/x₇ \]  \[ (2) \]

\[ N = .4/x₁ + .3/x₂ + .2/x₃ + .8/x₄ + .7/x₅ + .4/x₆ + .2/x₇ \]  \[ (3) \]

\[ S = .3/x₁ + .2/x₂ + .4/x₃ + .9/x₄ + .8/x₅ + .9/x₆ + .8/x₇ \]  \[ (4) \]

\[ W = .7/x₁ + .9/x₂ + .8/x₃ + .4/x₄ + .3/x₅ + .2/x₆ + .4/x₇ \]  \[ (5) \]

It needs to be made clear that the present method does not determine if the decisions are good or bad. It only determines how closely the decisions of an experienced auditor seem to follow the value of the chosen attribute.

* It should be noted that, unlike the probability theory, the rough set theory does not require the sum of the two numbers to be equal to one.
The rules will be reasonable if the attributes chosen are relevant to how the decisions are made.

The next step is to compute the measures $I(MCF)$, $I(NCF)$, $I(SCF)$, $I(WCF)$, $I(M\cap SCF)$, $I(M\cap WCF)$, $I(N\cap SCF)$, and $I(N\cap WCF)$. These quantities yield the minimum degree to which possible combinations imply diagnosis $F$. A threshold alpha level of 0.5 is picked so that if $I(XCY)$ is less than 0.5, any partial implication $X \rightarrow Y$ is ignored. The lower the level of alpha selected, the more partial implications are taken into account. The specified value of alpha is problem dependent. Computations of the function $I$ as shown in the appendix at the end of the paper are as follows:

$$
I(MCF) = 0.4 \quad [6] \quad I(M\cap SCF) = 0.4 \quad [10] \\
I(NCF) = 0.3 \quad [7] \quad I(M\cap WCF) = 0.6 \quad [11] \\
I(SCF) = 0.3 \quad [8] \quad I(N\cap SCF) = 0.3 \quad [12] \\
I(WCF) = 0.6 \quad [9] \quad I(N\cap WCF) = 0.6 \quad [13]
$$

The following rules are obtained from the above:

1. If irregularity is material, then fraud is present 0.4
2. If irregularity is not material, then fraud is present 0.3
3. If internal control is strong, then fraud is present 0.3
4. If internal control is weak, then fraud is present 0.6
5. If irregularity is material and internal control is strong, then fraud is present 0.4
6. If irregularity is material and internal control is weak, then fraud is present 0.3
7. If irregularity is not material and internal control is strong, then fraud is present 0.3
8. If irregularity is not material and internal control is weak, then fraud is present 0.6

In the above example, the degree of belief in rules (4), (6) and (8) is 0.6. However, only rule (4) needs to be extracted. Had the degree of belief in rules (6) and (8) exceeded 0.6, these rules would have been kept. Because, in that case, rules (6) and (8) would have added to the information obtained through rule (4). Rules (4), (6) and (8) have been generated by certainty in the sense that we look at the degree to which presence of materiality is a subset of the existence of fraud. It should, however, be noted that only partial belief (0.6 here) can be expressed in the degree to which these rules can be inferred.

Possible rules to infer presence of fraud will now be extracted through the computation of measures $J(M\wedge F)$, $J(N\wedge F)$, $J(S\wedge F)$, $J(W\wedge F)$, $J(M\cap S\wedge F)$, $J(M\cap W\wedge F)$, $J(N\cap S\wedge F)$, and $J(N\cap W\wedge F)$ as shown in the appendix. Again, a threshold level of alpha needs to be selected, such that if $J(X\wedge \neg Y)$ is less than the specified level, then the degree to which $X$ intersects $Y$ is ignored. In general, if $X$ intersects $Y$ and if $y$ is some element of $X$, it is possible that $y$

* The numbers in a real situation might be different and might lead to the extraction of a different set of rules.
is in $Y$ (although this is not a certainty). For the purposes of the example under discussion, an alpha level of 0.6 is selected. The computation of $J$ yields the following:

$$
J(M \neq F) = 0.8 \quad [14] \quad J(M^0S \neq F) = 0.6 \quad [18] \\
J(N \neq F) = 0.4 \quad [15] \quad J(M^0W \neq F) = 0.7 \quad [19] \\
J(S \neq F) = 0.6 \quad [16] \quad J(N^0S \neq F) = 0.4 \quad [20] \\
J(W \neq F) = 0.8 \quad [17] \quad J(N^0W \neq F) = 0.4 \quad [21]
$$

The above leads to the following rules:

9) If irregularity is material, then fraud is possible 0.8

10) If irregularity is not material, then fraud is possible 0.4

11) If internal control is strong, then fraud is possible 0.6

12) If internal control is weak, then fraud is possible 0.8

13) If irregularity is material and internal control is strong, then fraud is possible 0.6

14) If irregularity is material and internal control is weak, then fraud is possible 0.7

15) If irregularity is not material, and internal control is strong, then fraud is possible 0.4

16) If irregularity is not material and internal control is weak, then fraud is possible 0.4

In this instance, the degree of belief in all the rules except rules (10), (15) and (16) exceed 0.6. But only rules (9), (12), (13), and (14) need to be retained because these rules imply the possibility of other rules. For example, rule (13) implies the possibility of rule (11). If the degree of belief in rule (11) was small but the degree of belief in rule (13) was large, it would indicate that the degree of materiality of the irregularity plays a dominant role in generating the possibility of fraud. It should be evident that similar rules could be derived for any number of symptoms and diagnoses.

The next step is to define the fuzzy terms involved in the diagnosis as a function of the terms used in the symptoms. Let $(B_i)$ be a finite family of fuzzy sets (not necessarily forming a partition of the universal set). Also, let $A$ be a fuzzy set. Then, by a lower approximation of $A$ through $(B_i)$, we obtain the fuzzy set:

$$
\underleftarrow{R(A)} = U_{i} \{B_i \cap CA\}B_i \quad (22)
$$

In [22] the union stands for the union of fuzzy sets and $I(B_i \cap CA)B_i$ denotes the fuzzy set obtained by multiplying $B_i$ componentwise by $I(B_i \cap CA)B_i$. Thus, if $B_i$ is a subset of $A$, $I(B_i \cap CA)B_i$ is close to the whole set $B_i$. On the other hand, if $I(B_i \cap CA)B_i$ is low, so is the contribution of $B_i$ to $\underleftarrow{R(A)}$. If we take the special case where all the sets are crisp, then [22] defines $\underleftarrow{R(A)}$ as defined by Grzymala-Busse (1988), i.e.

$$
\underleftarrow{R(A)} = \{x/ [x \cap CA]\}
$$

At times it is advantageous to throw away all the sets $B_i$ if $I(B_i \cap A)B_i$ is less than some threshold alpha. In this case, we write:
Here, the right hand of [23] is taken over all \( B_i \) for which \( I(B_iCA) \leq \alpha \). Similarly, an upper approximation of \( A \) through \( (B_1) \) can be defined as:

\[
\overline{R}(A) = UJ(B_1 \neq A)B_i \tag{24}
\]

and

\[
\overline{R}(A)\alpha = UJ(B_1 \neq A)B_i \tag{25}
\]

where the right hand side of [25] is over all \( B_i \) for which \( J(B_i \neq A) \geq \alpha \).

In the case where all sets are crisp and \( (B_i) \) is a partition: \( R(A) = \{x/\{x\} \cap A \neq \emptyset \} \) as defined by Grzymala-Busse (1988).

Reverting to the initial example in this paper, if \( \alpha \) is picked to be \(.6\), \( B_1 = W, B_2 = M \cap W, \) and \( B_3 = N \cap W, \) then

\[
\overline{R}(F)_{.6} = .6W
\]

Thus, the (fuzzy) set \( W \) can be used to approximate fraud. Similarly, if \( \alpha \) is picked to be \(.6\) and \( B_1 = M, B_2 = S, B_3 = W, B_4 = M \cap S, B_5 = M \cap W, \) then a combination of the symptoms \( M, S, \) and \( W \) is used to describe the set of possibly fraudulent cases.

\[
\overline{R}(F)_{.6} = .6M \cup .6S \cup .8W
\]

4. Conclusion

In this paper, we presented an approach to the detection of irregularities by the auditor which takes into account the important fact that auditors have an arduous task of knowledge acquisition under uncertainty. We demonstrate how knowledge is acquired through examples and how rules are established for detection of irregularities. We also develop measures of how much trust could be placed on these rules. It should be stressed that the learning of rules is dependent upon the relevance of the value of selected attribute to the conclusion in the examples provided. For example, it may seem that rule (11) is not reasonable. However, case \( x_6 \) establishes that although internal control is strong \( (.9) \), the presence of fraud should not be completely ruled out \( (.8) \). Rule (11) reflects the experience picked up from case \( x_6 \). As the number of examples grows through experience, the rules should become more reasonable and could be utilized in practice provided that the following conditions are met:

1) The attributes picked are relevant.

2) The expert assigning values to the attributes is reliable.

The approach developed in this paper can easily be utilized in the development of an expert system for the detection of irregularities.

References


Larsson. S. and G. Chesley. An analysis of the auditor's uncertainty


Appendix 1

De Korvin, et al. (1991) have defined I(ACB) as a function that measures the degree to which A is included in B. The computational formula for this function is given by:

\[ I(ACB) = \min \max \{1-A(x), B(x)\} \]

This means that I(ACB) is obtained by (i) comparing the coefficients of \{1-A(x)\} and B(x), (ii) listing the maximum values for each (x) and (iii) selecting
the minimum of the maximum value in the list. For example, consider the degree to which materiality is included in the diagnosis of fraud. From equation [2], we know that:

\[
F = .8/x_1 + .8/x_2 + .7/x_3 + .3/x_4 + .4/x_5 + .6/x_6 + .4/x_7 \quad \text{and}
\]

\[
M = .8/x_1 + .7/x_2 + .9/x_3 + .3/x_4 + .2/x_5 + .7/x_6 + .8/x_7
\]

therefore, \(1 - M) = .2/x_1 + .3/x_2 + .1/x_3 + .7/x_4 + .8/x_5 + .3/x_6 + .2/x_7\)

According to steps (i) and (ii) above, we compare the \(x\) values of \(F\) and \(1 - M\) and list the maximum values of each \(x\) as follows:

\[
.8/x_1 + .8/x_2 + .7/x_3 + .7/x_4 + .8/x_5 + .3/x_6 + .2/x_7
\]

\((1 - M)\) is obtained by selecting the minimum of the maximum values of \(x\) listed above which yields:

\[
I(MCF) = .4
\]

The function \(J(A \cap B)\) measures the degree to which \(A\) intersects \(B\). The computational formula for this function is given by:

\[
J(A \cap B) = \max \min \{A(x), B(x)\}
\]

This means that \(J(A \cap B)\) is obtained by (i) comparing the coefficients of \(A(x)\) and \(B(x)\). (ii) listing the minimum values for each \(x\) and (iii) selecting the maximum of the maximum value in the list. In the above example, therefore, \(J(M \cap F)\) will be:

\[
\min\{F(x), M(x)\} = .8/x_1 + .7/x_2 + .7/x_3 + .3/x_4 + .2/x_5 + .6/x_6 + .4/x_7
\]

and \(J(A \cap B)\) is obtained by selecting the largest number. Thus, \(J(M \cap F)\) = .8.

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**XVIII Annual Conference of IAA**

The XVIII Annual Conference of the Indian Accounting Association will be held in Dharwad, Karnataka, some time during the summer vacation in 1994. Professor Bhagwati Prasad, Director, Kousali Institute of Management Studies, Karnataka University, Dharwad-508 003, has kindly agreed to organise the conference. The **topics** for the next conference are: (i) Liberalisation Policy and Indian Capital Market, and (ii) Corporate Disclosure Practices. The conference will be followed by a seminar on a contemporary issue in accounting. Further details regarding the conference and the seminar will be published in the December 1993 issue.
In this paper, the author at first offers an historical perspective of the evolution of standards in relation to Inflation Accounting in some industrially developed countries and then examines the role that research can play in offering guidelines for setting sound Inflation Accounting standards. Finally, the paper explores the need to conduct research for assessing the applicability of different inflation accounting techniques in Indian conditions.

Introduction

The purpose of this paper is to highlight the role of research in setting Accounting Standards (AS) in the context of Inflation Accounting (IA). Researchers and standard setters around the world have experimented with different techniques of IA. The period during which these activities are carried out prominently has been associated with consistently high rate of inflation.

In India, we are experiencing the evils of inflation throughout the last two decades. The annual rate of inflation during the period was within the range of 7% to 9%. During the last few years the rate has entered double digits, reaching 13% level. However, very few researchers have endeavoured to examine the IA techniques applicable to our conditions.

The paper is organised as follows: In the first section, recent developments in AS setting in some economically developed countries are assessed with special reference to IA. The second section emphasises the role of research in setting inflation accounting standard. Finally, the need and scope for these activities in India is explored.

Inflation Accounting Standards

The scope of this section is restricted to the highlights of the recent history of the AS set in Britain, America and Australia. Standards include all proposals either in the mandatory or recommendatory form irrespective of the power and position of the issuing body.

In Britain, in 1952 a statement by the Institute of Chartered Accountants in England and Wales (ICAEW) recognised the limitations of Historic Cost Accounting (HCA) but did not find the alternatives proposed at that time to be acceptable. The statement focused on the use to retain sufficient earnings to cover higher replacement costs. During 1970-73, the Accounting Standards Committee (ASC) worked on a standard for Current Purchasing Power (CPP) accounting. In January 1974, the Government set up the Sandilands Committee on Inflation Accounting and in May 1974 the ASC

* Dr. (Mrs.) Ranade is Dean of Commerce of SNDT University, Pune.
issued a provisional Standard (SSAP 7) on CPP accounting. In 1975 the Sandilands Committee proposed Current Cost Accounting (CCA) as complete replacement of HCA. The ASC issued ED 18 in 1976 based mainly on the Sandiland proposals. In 1977, the members of ICAEW passed a resolution and rejected ED 18. The ASC then brought out Hyde guidelines which required a Current Cost Profit Statement to be included with certain published accounts. In March 1980, SSAP 16 was adopted on a three year trial basis. It's mandatory status was suspended in June 1985. The current problems of both valuation and income measurement faced in the UK are partly due to the demise of SSAP 16. The pressure of changing prices and the need to report their consequences still exists. but as pointed out by Tweedie et al (1991), there is no systematic way of doing this and the current accounting practice in the UK is an hybrid of traditional historical cost and various methods of current valuation.

During the post-war period, interest in IA in both the USA and the UK proceeded continuously but changed with the intensity of the inflationary pressures (see Mumford, 1979 for his work on Inflation Accounting cycle). In 1974 professional and standard setting bodies favoured CPP adjustments to traditional historical cost data. However, the Securities and Exchange Commission (SEC) expressed their preference for replacement cost accounting. In August 1975, the SEC required large listed companies to publish certain replacement cost data as supplementary disclosures to the accounts. The standard-setting body in the USA, the Financial Accounting Standard Board (FASB) issued its Exposure Draft, Financial Reporting and Changing Prices in December 1978. Public enterprises were required to provide supplementary information about the effects of changing prices on income from continuing operations by using either a CPP basis or a current cost basis. The Exposure Draft was certainly of an innovative nature but failed to give sufficient exposure to either of the methods. In March 1979, the FASB issued its supplement on Constant Dollar Accounting. It advocated the use of Consumer Price Index in place of GNP implicit price deflator. It also proposed the classification of foreign currency, deferred income taxes as monetary items. The FASB published the Statement of Financial Accounting Standards No. 33 (FAS 33) in September 1979. This happened to be the first mandatory AS dealing with IA in the English-speaking world. It advocated the removal of the choice of basis for the supplementary statement i.e. both current cost and CPP data were required. Otherwise, the disclosure requirements were closer to those of 1978 Exposure Draft. This experiment was certainly a step forward to bring closer the preparers and users of accounts.

As is clear from the recent history of IA standards in the US, a form of Current Cost adjustment are used in the line with the developments in other countries. However, the distinctive feature of these developments in the US is that CPP is used either as an alternative or as a complement to CCA.

In Australia, the first Exposure Draft for price-level changes based on CPP basis was issued by the Australian Accounting Standards Committee (AASC) in 1974. The Committee advocated the use of the Gross Domestic Product implicit price deflator as the indicator of purchasing power. In 1975, AASC brought out the second Exposure Draft on Current Value Accounting. It was in favour of an income measure based on the maintenance of the operating capability of the entity. It proposed a form of deprival value for asset valuation. In October 1976, a Provisional Accounting Standard was issued by the Institute of Chartered Accountants in Australia (ICAA) and
the Australian Society of Accountants (ASA) which recommended the use of CCA for the preparation of financial statements.

The second phase in the development of CCA began with the Exposure Draft on the Recognition of Gains and Losses on Holding Monetary Resources in the context of CCA. This was brought out on behalf of ICAA in July 1978. The main concern of the ED was the effects of inflation on monetary items.

In March 1980 Australian Accounting Research Foundation (AARF) issued CCA - Omnibus Exposure Draft. With this, Australian CCA programme seems to have entered into the third phase. This ED proposed accounting treatments for non-monetary assets bought and sold on the same market, investments, decreases in current cost, foreign currency translation, goodwill and non-monetary liabilities. Some of these proposals were strong enough to provoke controversies in Australia in the course of development of accounting for price-level changes.

In 1983, the ASA and ICAA published a non-mandatory recommendation statement of Accounting Practice No. 1 on CCA. These recommendations combined the earlier exposure drafts and the proposals of the earlier Provisional Standard. The main changes introduced in SAP 1 cover the historical cost profit being adjusted by depreciation and cost of sales charges in current terms and by gains or losses on holding monetary items to arrive at CCA entity profit. In spite of these developments no mandatory AS was experimented with in Australia.

Taken together it seems that the standard-setting bodies in all the three countries considered here have gone through the cycle of initial preference for CPP, then Government intervention with CCA preference, followed by a period of debate in which the form of CCA was modified. However, the most important Australian contribution to the IA practices followed was the modification of the pure deprival value method of asset valuation. This approach uses the criterion of whether the asset is to be used in the business to determine its valuation basis and the concept of the 'recoverable amount' to assess value where neither replacement cost nor net realisable value is appropriate.

The similarities experienced in the development of IA Standards in these countries could be attributed mainly to two factors i.e. the presence of cultural and economic ties among them and the similarity of inflation rates experienced by these countries during 1974-80. During this period inflation adjustments were prominently considered by standard-setters, academics and professional accountants in these countries. Another factor influencing the similar IA developments in the countries considered here is self-interest. It is observed that the practising accountants favoured the proposals based on CPP while the support for CCA or replacement cost came from industry and commerce. This may be partially due to the tendencies to safeguard self-interest. CCA adjustments being more closer to the projection requirements of individual firms. Profit figures with current cost adjustments were considered as more useful by the firms for wage bargaining, dividend declarations and tax reduction.

The Role of Research in Inflation Accounting Standard-setting

While highlighting the role of research in setting Accounting Standards, Whittington has pointed out: 'research is important for the development of accounting standards ..... Whether such research should be directly

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sponsored by the standard-setting body or whether it should be a matter for individual enterprise, and whether standards themselves should be set by state or private bodies or should be allowed to evolve as a matter of custom are important issues. In whatever form standards develop, it seems likely that they will have greater internal consistency be more relevant to their objectives and better comprehended by those who apply and use them, if they are based upon sound logical principles and upon assumptions which have been openly discussed and where relevant empirically tested.' (Whittington, 1983, page 46).

Research certainly provides a sound base for the Inflation Accounting standards as well. It also enhances their applicability and usefulness. However, in this context, a wide time lag is experienced between the presentation of research outcome and its reflection in the standard-setting activity. This could be elaborated with the case of Sweeney's research work.

As an outcome of the First World War, many European countries notably the German economy experienced unusually high rate of inflation. The two major IA models i.e. CPP and CCA were formulated during this period by the German researchers. Sweeney synthesized this work and later in 1936 he produced the detailed CPP model in English. This served as a model for the CPP system proposed in the UK ED8 in 1973 and PSSAP 7 in 1974 and in the US for APB 3, 1969, and FASB Exposure Draft of 1974. His work was basically the work of his Ph.D thesis. But he was very much keen to maintain the practicability of his proposals. He advocated replacement cost and considered the 'CPP adjustment based on it as his ideal accounting model. This proposal was certainly ahead of certain practices in both the UK and the USA.

Academics have greatly contributed to the debate on IA, with a view to project business performance undistorted by the effects of changing prices. This issue has been looked into, notably, by Edwards and Bell (1961), Chambers (1966), Sterling (1970) and Revsine (1973). Although their proposals were mainly based on the theories developed by earlier writers, they contained advanced theoretical sophistication. This has influenced and created the need to make accounts use-oriented. The recent US standard (IAS 33) is consistent with this view of concentrating on profit figures.

In addition to the theoretical research, more recently, empirical research is carried out covering various aspects of IA. Some of the field studies are conducted by standard-setting bodies such as FASB (1977). Many utility studies have also been conducted in this area in the recent past e.g. for prediction of business failure Kartz (1978) and Norton et. al. (1979) examined general price level adjusted accounting rates while Mensah (1983) and Skogsvik (1990) tested CCA based ratios. Similarly, the association between various accounting numbers and security market prices or returns has also been investigated by a number of researchers. Beaver et. al. (1982), Schaefer (1984) and Ohlsen (1985) did not find any additional explanatory power of CCA on share price returns. However, Bublitz et. al. (1985) and Peasnell et. al. (1987) did find a significant additional effect. These type of utility studies have so far had no noticeable impact on the practical standard-setting process. However, such empirical studies should have theoretical base and at the same time the theoretical assumptions on which the standards are developed should be empirically tested. Some such studies have influenced the evolution of accounting standards e.g. Peasnell and Skerratt's study of the use of alternative price indices (1976). This study
was considered by the Inflation Accounting Study Group (1976) while preparing ED 18 in the UK.

Inflation Accounting in India

In India we are experiencing the evils of inflation throughout the last two decades. The annual rate of inflation during this period was within the range of 7% to 9%. Since 1983-84, the rate has entered double digits, presently reaching 13% level. However, very few researchers have endeavoured to examine the IA techniques applicable to our conditions here and to make our contribution to the debate on IA. Empirical research and the utility studies with the use of these techniques are conspicuous by their absence.

In addition to the published and unpublished Ph.D dissertations of some researchers Porwal et al (1983), Sen (1987), Murao (1975), Chattopadhyay (1975) have looked into various IA techniques in use elsewhere.

The Institute of Chartered Accountants of India (ICAI) is the premier institute which issues AS. Eight of the eleven accounting standards issued by it so far have come into force from financial years beginning on or after April 1, 1991. What is expected of this institute in this context is the support to theory based empirical research to assess the utility of different IA techniques in Indian conditions.

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BOOK REVIEW


Accounting for Human Assets is a new concept and the number of enterprises adopting this concept has been increasing in recent times. This book on "Accounting for Human Assets: Concepts, Systems and Practices", edited by D.Prabhakara Rao, consists of 18 chapters contributed by various academicians and an executive from different parts of the country. The sequential organisation of various articles of the book facilitates a smooth understanding of several dimensions of the subject matter.

The editor himself has contributed to approximately fifty per cent of the pages of the book, in his six papers, covering (i) Macro View of Human Resource Accounting; (ii) Design of Accounting Systems; (iii) Implementation of Human Resource Accounting at R.G. Barry (USA) and (iv) the Indian practices, with particular reference to the selected companies like BHEL, MMTC, SPIC, SAIL, ACC, NTPC, CANFINA etc. The editor, in one of his articles, has found a close relationship between the expenditure on human resources and economic development (p.26). India is one of the countries with a low ratio of Human Expenditure to Gross National Product, at below three per cent against the suggested ratio of five per cent, as per the Human development Report-1991 (p.40) of the United Nations Development Programme. The share of labour-force in the Indian population is 37.9 per cent while that of Japan is 97.8 per cent. However, the rate of increase in the educated unemployment is 14.71 times the rate of increase in the organised sector employment of human resources. The author suggested a system of human resource accounting for monitoring the changes that are taking place in the stock of India's human resources. The author claims that such an information system would help our planners with the relevant data and information to tackle some of the critical problems raised in pages 40-41 of the book.

Prof. B. Banerjee has presented the concepts of Human Resource Accounting (HRA) in a very lucid manner. Prof. A. Shankaraiah has advocated a new model of HRA for the Public sector enterprises. Prof. P. Chattopadhyay has synthesised the concepts of HRA, HRM and HRD. The papers of Prof. K. G. Desai and Prof. C. Suryanarayana are not directly related to HRA. Probably, the editor might have thought of supplementing HRA with HRD and Management Development areas, so that the readers will be better informed of the total concept.

Prof. G. C. Maheswari has presented a paper on HRA in the decision usefulness context. Prof. C. M. Muniramappa, Prof. K. Rajeswara Rao. Prof. G.Krishna Murthy and others have discussed some of the issues and problems in the adoption of HRA. Prof. Briz Mohan Lall Nigam has explained the need for development of standard guidelines in implementing HRA. This book will be of practical value to the new generation of researchers on Human Resource Accounting.

Dr. G. Subrahmanyam
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Andhra University

9th May, 1993
Financial Policy and Management Accounting by Dr. Bhabatosh Banerjee has blended Financial Policy with Management Accounting which are in fact inseparable. This addition has filled up an existing gap in accounting literature. The chapter on Sources of Finance contains, inter alia, a thorough discussion on various types of leases including accounting treatment of lease transactions.

The book contains in Chapter 2 and 3 Working Capital Management and also embodies in greater detail the implications of Tandon Committee and Chore Committee norms with numerical examples. The outstanding feature of the book is that it makes a pragmatic analysis of working capital management under different circumstances which is helpful for business policy planners and academics as well. It embodies the historical account in respect of developing conceptual framework of working capital from balance sheet approach and also from operating cycle approach. However, Marathe Committee's and A. Ghosh Committee's recommendations in respect of providing working capital by commercial banks, may also be included in future editions. Further, the discretion in interest rate structure allowed to the commercial banks within the prescribed ceiling limit of interest rate announced in 1992 for infusing liberalisation and competition in banking sector may also be added in future editions of the book.

In Chapter 2, Sources of Finance, a few lines on Commercial Paper (CP) as an instrument of finance may be added. Working capital management has been divided into six sections and thus it takes care of theoretical discussion supported by practical problems. The plus point of this book lies in that it would help the students to prepare themselves in the line of syllabi of various universities. Large number of exercises, illustrations have been provided on Changes in Financial Position : Funds Flow, Cash Flow, and on Accounting Ratios. These three chapters, 3, 4 and 5, are exhaustive and enable the student to prepare for the paper Financial Statement Analysis.

The discussion on Accounting Ratios has aptly incorporated certain issues which are unique and not to be found in conventional text books. namely, selection of standard accounting ratios along with composite ratio accounting and financial analysis. Besides, the chapter devotes adequate attention to the analysis, theories and techniques of inter-firm comparison which have enhanced the academic weight of the book.

Industrial sickness has been a topic of concern for finance managers and business policy planners. The author has spotlighted multi-cornered issues of industrial sickness. He has made a broad and intensive analysis of the tools of predicting and forewarning the industrial sickness in India, the USA and other countries, developed various authors and industrial financing agencies.

The next chapter, Inflation Accounting, has been a contemporary measure of concern for Accounting and Finance people. The change in price level has distorted the historical cost concept of accounting and thus contested the reliability of financial statement and reporting of the financial position. The author has very efficiently analysed the different phases of accounting for and reporting of price level changes. The chapter also highlights the application of inflation accounting methods suggested by various professional accounting institutes and academic associations of
different countries of the world. The chapter enhances the quality of the book by incorporating a number of practical problems pertaining to accounting for price level changes in financial statements. This satisfies the requirement of syllabi of B.Com. Major, M.Com and M.B.A. courses of universities as well as of other professional examinations. The subject matter has been ably dealt with in the book.

The finance function, inter alia, entails use of scarce resources in order to ensure higher return to the shareholders and in effecting favourable changes in sales resulting from large change in income. These factors have been lucidly analysed with suitable and relevant examples under the framework of operating and financial leverages. The intricacy of drawing a trade-off level between the risk of using certain mix or form of resources and their expected rate of return has been well manifested by Professor Banerjee. Theoretical discussion has been adequately supported by practical illustrations.

However, the nature of finance, conceptual framework of finance and various finance functions relating to business decisions are not clearly and adequately embodied in this book. The essence of finance and the functional areas of finance may be incorporated in the next edition of the book. Financial services, factoring services in management of receivables and other phases of finance functions have not been adequately covered.

Capital structure theory and planning along with dividend policy are well documented and presented. Some empirical results from selected studies over public sector units in India in respect of their capital structures and dividend policy have been well-structured and designed. Implication of dividend declaration on capital structure has been authoritatively demonstrated in Chapter 11 under Dividend Policy. This demonstrates the author's deep understanding, appreciation and application of dividend policy matters in a given business situation.

However, in the chapter on Management Control System and in the chapter on Cost Information two more items of contemporary significance may be incorporated in future editions. One is Value Engineering or Value Management and second one is Activity Based Cost (ABC) accounting. Although lots of empirical work have been done in the USA and in western nations on these two topics, not much has been done in this country. Addition of these two elements in relevant chapters would further enhance the quality of this outstanding book.

Cost Information System (CIS) as an aid to finance function may also be covered in a future edition. Certification of value engineering and cost information system have become more relevant for Indian business enterprises on account of globalisation of Indian economy.

By and large, the book would go a long way to serve as the nucleus of literature in this branch of study integrating finance function into the accounting system. This is the greatest quality of this book hardly found in other books available on the subject.

Dr. Sujit Sikidar
Professor of Commerce
Gauhati University

April 26, 1993.
INTERNATIONAL CONFERENCE NEWS

Fifth Asian-Pacific Conference on International Accounting Issues
November 3-6, 1993
Mexico City, Mexico

1. Background

The Fifth Asian-Pacific Conference on International Accounting Issues will be held from November 3 to 6, 1993, in Mexico City, Mexico. The main theme of the conference is *International Accounting Standards and Regional Economic Integration*. The Conference will provide an important forum for the interaction of different ideas and information between academicians and practitioners, in order to enhance the understanding of international accounting issues in various Asian-Pacific countries.

Research paper presentation and special workshops will be held by well-known international accounting scholars and practitioners to discuss issues on international accounting research, education, and practice, impact of advanced technology on international accounting, comparative ethics in international auditing and business, and related international accounting topics. Prominent scholars and practitioners from many countries the world over are expected to attend the conference.

2. Topics

Paper presentations, panel discussions, and workshops on international accounting and other related international business topics are invited. Major topics of interest include, but are not limited to:

- International accounting research, education, and practice.
- Accounting standards, auditing standards, and taxation issues among the North American Free Trade Agreement (NAFTA) countries.
- Comparative analysis of financial accounting, managerial accounting, public sector accounting, auditing and taxation among Asian-Pacific countries.
- Contemporary issues of advanced technology in international accounting.
- Information and control systems for multinational corporations.
- Interrelationship between accounting and other disciplines (such as management, marketing, finance, economics, human resource management and information management).
- Accounting in specific country or economy.
- Comparative ethics in international auditing and business.
- Cross cultural studies in international accounting.
- Accounting history in Asian-Pacific countries.
- Impact of international mergers and acquisitions on accounting practice.
- Other related international business topics.

[Last date for paper submission: May 15, 1993.]
3. Conference Registration Fee

   Early Registration (received by August 30, 1993)   US $ 200
   Late Registration (after August 30, 1993)         US $ 250

   Registration fee covers Reception, 2 Breakfasts, 2 Luncheons, 1 Dinner (Banquet and Entertainment), copy of Conference Proceedings and One-Day Tour.

   Send your draft along with your particulars, e.g. Name, Position, Organisation, Address, Telephone/Fax Number to: Professor Ali Peyvandi, Asian-Pacific Conference on International Accounting Issues, The Sid Craig School of Business & Administrative Sciences, California State University, Fresno, California—93740—0007, U.S.A. The draft should be drawn in favour of C.S.U.F. Foundation. [Fax (209) 278—4911]

4. Hotel Reservations Request

   Rooms in Hotel Camino Real, Mexico, at special rate is available for pre- and post-convention lodging subject to availability.

   Rates for Hotel Rooms: De Luxe Rooms: US $ 105 subject to 10% V.A.T. Tax.

   Reservations received after August 30, 1993, will be on a space available basis. Check-in-time is 3.00 p.m. Check-out time is 12 noon. Draft should be drawn in favour of Mexico Camino Real, S.A.D.F. C.V. For hotel reservation send one night’s deposit along with particulars of your journey to Professor Ali Peyvandi.
Report on 17th Annual Conference of IAA

The 17th Annual Conference of the Indian Accounting Association (IAA) was held at Udaipur, Rajasthan, during February 14 to 16, 1993 under the joint auspices of the Faculty of Commerce, M. L. Sukhadia University, Udaipur, and the Udaipur Branch of Indian Accounting Association.

The Conference commenced on Sunday, February 14, on a melodic note with the welcome song reverberating through the University's R. C. A. Auditorium. The inaugural session was graced by the presence of Prof. S. K. R. Bhandari, former Vice-Chancellor of APS University, Rewa and past President, IAA, as chief guest. Dr. R. K. Rai, Vice-Chancellor, M.L. Sukhadia University, inaugurated the Conference and Prof. K. R. Sharma, the Organising Secretary, delivered a warm welcome address. This was followed by the Presidential Address delivered by Dr Chhote Lal, outgoing President of the Association. Other highlights of the opening session included the Chief Guest's speech, the Chairman's speech and a hearty vote of thanks.

Prof. Bhabatosh Banerjee, former President of the IAA, was felicitated by Prof. S. K. R. Bhandari, Chief Guest, for being nominated as Vice-President of the International Association for Accounting Education and Research for a period of four years with effect from January, 1993.

The First Technical Session held in the afternoon of February 14, 1993, focused upon "Accounting and Financial Management of Small Business", with Prof. Bhabatosh Banerjee of Calcutta University and Prof. D. C. Sharma of Jiyaji University as Chair and Co-chair, respectively. Prof. N. M. Khandelwal, Senior Vice-President of IAA, was the main speaker and Prof. M. L. Dashora and Dr N. K. Pandya were the rapporteurs. Twenty three papers were presented during the session. The paper writers included Dr A. K. Thakre, Dr J. B. Sarker and Prof. P. Das, Dr C. K. Sonara, Dr M. L. Dashora and Prof. P. R. Somani, Sri P. S. Chauhan, Dr R. L. Tamboli, Dr D. C. Sharma, Sri Indrajeet Dhar, Dr Rajendra Singh Vaghela, Dr S. Bhanawat, Sri Uttam Kumar Datta, Dr G. Soral and Mrs Sudha Jain, Dr N. S. Rao, Sri S. K. Mangal and Dr B. L. Gupta. Prof. D. C. Sharma, Co-chairman, made his observations on the problems of small business. This was followed by a discussion where the following speakers participated: Dr V. K. Trivedi, Dr G. L. Shah, Sri Indrajeet Dhar, Prof. Bhagwati Prasad, Prof. G. C. Maheswari, Dr S. K. R. Bhandari and Dr C. M. Jain. Prof. B. Banerjee, Chairman of the session, summarised the proceedings and made observations on the issues raised during discussion.

Though the discussions were broad ranging, the conclusions for the most part revolved around simplification of accounting practices, expansion of the technical base of small businessmen and the inclusion of small business management courses and training programmes in the college/university curriculum. At the end, Dr. N. S. Rao, Head, Dept. of Accountancy and Statistics, M. L. Sukhadia University, Udaipur, offered a hearty vote of thanks.

The Second Technical Session held in the morning of February 15 dwelt on the theme of "Appraisal of Direct Taxes in India". Prof. Bhagwati Prasad of Karnatak University was in the Chair and Prof. K. R. Sharma of M. L. Sukhadia University was the Co-chairman. The keynote address was given by Prof. Bhairav H. Desai and the rapporteurs were Prof. S. Lalwani, Dr N. S. Rao and Dr S. Bhanawat. Expectedly, this session generated some active brainstorming with as many as twenty seven papers being presented by the following paper writers: Dr B. H. Desai, Dr. A.K. Sengupta, Prof. S.
The three major issues of debate that emerged from the presentations were abolition vs. simplification of income-tax, levying of agricultural income tax and necessity or otherwise of clubbing of income-tax. Prof. Sukumar Bhattacharya was invited to participate in the deliberations as a Guest Speaker. The other speakers, during discussions, were: Prof. N. M. Khandelwal, Dr. G. L. Dave, Sri Arup Choudhury, Prof. Mansoor Ali, Dr. N. D. Mathur, Dr. G. L. Dave, Dr. B. P. Bhattacharya, Dr. A. K. Sengupta and Dr. Lalit Gupta. After Prof. Bhagwati Prasad, Chairman of the session, made his observations on the discussions, Dr. I. V. Trivedi of M. L. Sukhadia University, Udaipur, moved a formal vote of thanks to all concerned.

The Conference was followed by a seminar on "Ethics in Accounting" on February 16, 1993. The session was chaired by Prof. N. L. Hingorani and co-chaired by Prof. G. C. Maheshwari. Prof. Sukumar Bhattacharya was the keynote speaker. The rapporteurs were Prof. Nageshwar Rao, Dr. R. L. Tamboli and Dr. G. Soral. In all, fourteen papers were presented by the following academics: Sri Amp Choudhuri, Prof. B. Banerjee, Prof. R. C. Sharma and Dr. M. B. Shukla, Prof. N. M. Khandelwal, Sri Radhanath Pyne, Dr. Lalit Gupta, Dr. M. L. Dashora & Sri M. G. Varsheneya, Sri P. K. Chakraborty, Prof. G. C. Maheswari, Dr. V. A. Pathak and Dr. B. H. Desai, Mrs. Kanika Mookerjee and Dr. Subhas Sharma.

The seminar concentrated upon four major contentious issues - conceptual dimensions of ethics, ethical relation of accounting with other disciplines, disclosure of moral conduct of business, and educational dimensions of ethics. In the end, the Chairman summed up the discussions nicely. Dr. G. Soral offered a vote of thanks.

After the seminar the Annual General Meeting of the Indian Accounting Association was held. It was chaired by Dr Chhote Lal. Prof. K. R. Sharma, Dean of Faculty of Commerce, M. L. Sukhadia University, was unanimously elected Junior Vice-President of the Indian Accounting Association. It was also decided that the next Conference of the Indian Accounting Association will be hosted by Karnatak University at Dharwad, with Prof. Bhagwati Prasad as the Conference Secretary, sometime during the summer vacation in 1994.

The itinerary also included local sight seeing in the afternoon of February 15 between 2.00 p.m. and 5.30 p.m. and a Cultural Programme at Shilpagram presented by the West Zone Cultural Centre. This was a golden opportunity for outstation delegates to have a fleeting glimpse of the natural, historical and cultural grandeur of Udaipur.
The Second Convocation of the Post-Graduate Diploma in Accounting Software, offered by the Academy of Applied Accountants (AAA), sponsored by IAA Visakha Branch and Sankar Foundation, Visakhapatnam, was held on 18th March 1993 at 5.00 p.m. at Andhra University. The Diploma was designed and started by the Indian Accounting Association, Visakha Branch on 29th March 1991, under the leadership of Prof. M. Gopalakrishna Reddy, the Vice-Chancellor of Andhra University.

The Chief Guest for the Second Convocation, —Prof. P.V.S. Rama Rao, Registrar, Andhra University, while delivering the Convocation address, advised the accounting academicians and practitioners, that they should be equipped with computer software knowledge to keep pace with the global developments in information technology. He congratulated the diploma-holders and directed them to keep themselves abreast of the latest developments in accounting software. While releasing a book entitled “Accounting for Human Assets: Concepts, Systems and Practices”, edited by Dr. D. Prabhakara Rao, Secretary of the Academy, and containing a Foreword by the Chairman of the Academy, sri K. Parvathi Kumar, Prof. P.V.S. Rama Rao, highlighted the importance of such research volumes comprising articles from distinguished academics from different parts of the country, for the cause of Research in Accounting and Finance.

Sri Kambhampati Parvathi Kumar, Academy’s Chairman, while delivering the presidential address, explained the basic mission of the academy as well as the jobopportunities to the diploma-holders. He commended the patience and skills of Dr. D. Prabhakara Rao, the Course Director for the successful organisation of the second batch, in spite of several constraints. He also appealed to the members of the Board of Management, for strengthening the programme to suit the increasing demand for accounting software.

Dr. D. Prabhakara Rao, the Course Director of the Academy, presented a brief report about the organisation and management of the Post-Graduate Diploma in Accounting Software, besides highlighting the activities of the Academy. He acknowledged the support received from Sankar Foundation, Dept. of Commerce & Management Studies, Rao & Kumar Chartered Accountants, and other organisations in conducting the programme. He also explained the association of the Dept. of Accounting of Hongkong Polytechnic, British Accounting Association, Institute of Chartered Financial Analysts, Indian Accounting Association and other agencies in improving the course content and outline of the Programme.

Later, the Chief Guest, Prof. P.V.S. Rama Rao, Registrar of Andhra University, presented the Diplomas and Prizes to the successful candidates. The convocation was well attended by executives from industry, practising chartered accountants, academicians, parents of the diploma-holders and guests. The Convocation ended with a hearty vote of thanks, formally proposed by Shri V.V. Ram Mohan, one of the members of the Academy of Applied Accountants.
Pune Branch

The members of the Indian Accounting Association residing in Pune have formed IAA Pune Branch very recently. The group consists of teachers in commerce, practising chartered accountants and investment consultants.

Dr. (Mrs.) Prabhat J. Ranade, Dean, Commerce Faculty, SNDT University, Pune, took the initiative in forming the Pune Branch of Indian Accounting Association.

Our heartiest congratulations to the members of the newly-born Branch.

Calcutta Branch

A Seminar on "Securities Scam" will be held on Saturday the 7th August, 1993, in the auditorium of the Indian Institute of Social Welfare and Business Management, Calcutta. Shri Chiranjit Banerjee, Managing Director, Market Share, will be the main speaker. The seminar will be presided over by Professor Sukumar Bhattacharya, the Chairman of the IAA Calcutta Branch.

The Seminar will be preceded by a small function to felicitate Professor Bhabatosh Banerjee for his nomination as the Vice-President of the International Association for Accounting Education and Research (IAAER).

The Annual General Meeting of the Branch will be held after the seminar.

Good Wishes to:

INDIAN ACCOUNTING ASSOCIATION

— A Well-wisher
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<th>No.</th>
<th>Title</th>
<th>Authors</th>
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<tr>
<td>2.</td>
<td>Industrial Relations</td>
<td>Dr. B. S. Mathur &amp; R. L. Novlakha</td>
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<td>3.</td>
<td>Industrial Law</td>
<td>Prof. K. B. Saxena, G. N. Sharma &amp; B. L. Porwal</td>
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<td>Advanced Accountancy</td>
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About the Association

The Research Development Association is an Organisation of Academicians, Industrialists, Administrators & Professionals. It is a non-profit organisation dedicated to the promotion and development of research in general and in the fields of Accounting, Business Management, Taxation and Finance in particular. The Association publishes research studies and books in the above mentioned fields. The Journal of Accounting & Finance is a bi-annual academic and research journal published by the Association.

Membership of the Association is available at the following subscriptions:

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The member of the association is entitled to get (a) free copy of the journal published by the Association, and (b) other publications at a discount of 60 per cent.

Enquiries concerning membership, subscription and other matters relating to the Association should be sent to the Hony. General Secretary, Research Development Association, 4-Ma-22, Jawahar Nagar, Jaipur 302004 (India). Phone: 566107.
Conference News

International Conference on Contemporary Issues in Accounting and Finance (September 10-12, 1994)

The sub-themes of the Conference are:

2. Inventory Management
3. Changing Phases of Inflation and Recession
4. Liberalisation of Economic Policy and Foreign Investment
5. Accounting Education and Research

Prominent Scholars, Distinguished Accounting Academicians and Professionals from India and abroad are expected to participate in the Conference in various capacities.

Conference Papers:

Papers on Conference topics are invited. The text neatly typed in double space, along with an abstract not exceeding 300 words should be submitted in duplicate latest by 31st January, 1994. All papers will be subject to review by a Technical Programme Committee and information about their acceptance or otherwise will be sent latest by 31st March, 1994.

Delegate Fee

Indian Delegates:
- Members of the Association: Rs. 500/- each
- Non-members: Rs. 700/- each
- Spot-Registration: Rs. 1000/- each
- Corporate Delegate: Rs. 1500/- each

Foreign Delegates:
- Members of the Association: U.S. $ 400 each
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THE INDIAN ACCOUNTING ASSOCIATION

The Indian Accounting Association is an organisation of persons willing to assist in the advancement of accounting education and research. The registered office of the Association is at the Department of Management Studies, Banaras Hindu University, Varanasi-221005, India. Membership of the Association is open to academics and professionals who are willing to assist in achieving the objectives of the Association.

The membership fees for individuals are as under:

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Members are entitled to participate in the activities of the Association and receive a free copy of the Indian Journal of Accounting and selected research publications.

INDIAN JOURNAL OF ACCOUNTING

Indian Journal of Accounting is an official publication of the Indian Accounting Association. It is published twice a year, in June and December.

The subscription rates are:

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<td>Individual</td>
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<tr>
<td>Annual</td>
<td>50</td>
<td>25</td>
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<tr>
<td>Life</td>
<td>400</td>
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| Institutional  |             |               |
| Annual         | 300         | 100           |
| Permanent      | 1,000       | 250           |

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