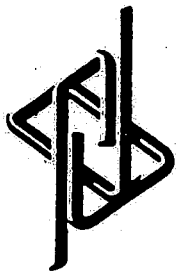
L'Association Canadienne des Professeurs de Comptabilité
The Canadian Academic Accounting Association

COMPTE RENDU
PROCEEDINGS

CONGRÈS ANNUEL DE 1988
1988 ANNUAL CONFERENCE



Juin 1988 / June 1988

University of Windsor

PROCEEDINGS OF THE CAAA 1988 CONFERENCE

COMPTE RENDU DU CONGRÈS ANNUEL DE 1988

The Canadian Academic Accounting Association

Toronto

1988

The Canadian Acacemic Accounting Association would like to express its appreciation to Prentice-Hall Canada, Inc., who has given financial support to this project.

Table of Contents/Table des Matières

L'Association Canadienne des Professeurs de Comptabilité
The Canadian Academic Accounting Association

January 10, 1989

To the Members of the
Canadian Academic Accounting Association:

I am pleased to present to you in this book the proceedings of the 1988 Conference held June 1-2 at the University of Windsor.

All speakers listed on the conference program were invited to submit their paper. Some authors decided to allow their papers to be published in this volume.

The program included a plenary session, twenty refereed concurrent papers (selected from a total of twenty-six papers which were submitted), three invited education committee sessions and two other invited sessions.

Thank you to:

1. Reviewers (see the attached list of 42 colleagues). I could never have prepared a program without their assistance.

2. Daniel Thronton and Farhad Simyar for their efforts in helping me select the best paper for the conference.

3. Chairpeople for sessions,

Jean Bédard	Laval
Milou Erickson	SMAC
Samuel Jopling	St. Mary's
Andrée Lafortune	H.E.C.
John Parkinson	York
Daniel Thornton	Toronto
Michael Zin	Windsor

4. CAAA Education Committee,

Derek Acland (Chairman)	Concordia
Jean Bédard	Laval
Joel Amernic	Toronto
Eldon Gardner	Lethbridge

5. Organizers of the Invited Education Committee Sessions,

Howard Armitage and Efrim Boritz	Waterloo
Eldon Gardner	Lethbridge
Becky Reuber	Toronto

6. Organizers of the sessions I invited,

Murrary Bryant	Toronto
Alan Macnaughton	Waterloo

7. The Honorary Accounting Society, Accounting Area, Faculty of Business Administration, University of Windsor, for providing musicians Peter Hodgson and Henry Janzen.

8. Publishers,

   Irwin Dorsey of Canada
   John Wiley & Sons of Canada Ltd.
   Prentice Hall of Canada Inc.
   Richard de Boo

9. Accounting Profession,

   Canadian Institute of Chartered Accountants
   Certified General Accoutants Association of Canada
   Society of Management Accountants of Canada

Finally, I am indebted to a very hard working and supportive executive under the leadership of Yvon Houle, supported very ably by Barbara Jaeger. And of course without the administrative support given by the Faculty of Business Administration, University of Windsor in the form of arrangements, without Christine Rauket-Liddell and the very able secretarial support of Sandy Berlasty and Sue Patterson, this conference would clearly not have taken place.

I am confident that there will continue to be an increase in the quantity and quality of academic accounting activity in Canada.

Sincerely,

Jeffrey Kantor
Associate Professor/Chairman of Accounting
University of Windsor
1988 CAAA Conference Chairperson

L'Association Canadienne des Professeurs de Comptabilité
The Canadian Academic Accounting Association

Le 10 janvier 1989

A l'intention des membres de
l'Association canadienne des professeurs de comptabilité:

Je suis heureux de vous faire parvenir le compte-rendu du congrès de 1988 ayant eu lieu les 1er et 2 juin à l'University of Windsor.

Les personnes dont les noms ont été mentionnés sur le programme du congrès ont été invitées à présenter leur mémoire. Vous trouverez dans le volume ci-joint les textes des mémoires que les auteurs nous ont permis de publier.

Le programme comprenait une séance plenière, la présentation de vingt mémoires (sur un total de vingt-six) sélectionnés par un jury, cinq séances où les participants avaient été invités dont trois du Comité de l'enseignement.

Je tiens à remercier:

1. Les réviseurs (voir la liste de quarante-deux collègues ci-jointe). Sans leur aide, ce programme n'aurait jamais pu être mis au point.

2. Daniel Thornton et Farhad Simyar qui m'ont aidé à choisir le meilleur mémoire du congrès.

3. Les présidents des séances,

Jean Bédard	Laval
Milou Erickson	S.C.M.C.
Samuel Jopling	St. Mary's
Andrée Lafortune	H.E.C.
John Parkinson	York
Daniel Thornton	Toronto
Michael Zin	Windsor

4. Le Comité d'enseignement de l'A.C.P.C.,

Derek Acland (président)	Concordia
Jean Bédard	Laval
Joel Amernic	Toronto
Eldon Gardner	Lethbridge

5. Les organisateurs des séances du Comité d'enseignement,

Howard Armitage et Efrim Boritz	Waterloo
Eldon Gardner	Lethbridge
Becky Reuber	Toronto

6. Les organisateurs des autres séances,

Murray Bryant	Toronto
Alan Macnaughton	Waterloo

7. L'Honorary Accounting Society, Accounting Area, Faculty of Business Administration, University of Windsor pour avoir retenu les services des musiciens Peter Hodgson et Henry Janzen.

8. Les éditeurs,

Irwin Dorsey of Canada
John Wiley & Sons of Canada Ltd.
Prentice Hall of Canada Inc.
Richard de Boo

9. La profession comptable,

L'Institut canadien des comptables agréés
L'Association des comptables généraux agréés
La Société des comptables en management du Canada

Je voudrais finalement remercier le Comité exécutif présidé par Yvon Houle, secondé par Barbara Jaeger, pour son aide et son travail considérables. Je suis également reconnaissant à la Faculty of Business Administration de l'University of Windsor, à Christine Rauket-Liddell,et à Sandy Berlasty de même qu'à Sue Patterson pour leur excellent travail de secrétariat. Sans leur concours, le congrès n'aurait pu avoir lieu.

Je suis persuadé que le travail accompli en comptabilité universitaire au Canada va continuer à croître en qualité comme en quantité.

Croyez, chers collègues, à l'expression de mes sentiments les meilleurs.

Jeffrey Kantor
Professeur agrégé/Président de la section comptable
University of Windsor
Président du congrès de l'A.C.P.C. 1988

Referees of conference papers
Arbitres des mémoires soumis

Name	University
Joel Amernic	Toronto
Terry Anderson	Ottawa
George Baxter	Saskatchewan
Jean Bédard	Laval
Tom Beechy	York
Stanley Beiner	Concordia
Len Brooks	Toronto
Murray Bryant	Toronto
Ramesh Chandra	Windsor
Joan Conrod	Toronto
Ross Denham	Alberta
Teviah Estrin	Windsor
Louis Etherington	Simon Fraser
Anne Fortin	U.Q.A.M.
Jacques Fortin	H.E.C.
Jack Freeman	Windsor
Eldon Gardner	Lethbridge
Mike Gibbins	Alberta
Samuel Jopling	Saint Mary's
Claude Lanfranconi	Western Ontario
Morley Lemon	Waterloo
John Macintosh	Windsor
Norm Macintosh	Queen's
Harvey Mann	Brock
Dan McDonald	Simon Fraser
Ahmed Naciri	U.Q.A.M.
Morton Nelson	Windsor
George Neal	Windsor
John Parkinson	York
Eileen Pike	New Brunswick
Al Prentice	Calgary
Rick Robertson	Western Ontario
Chris Robinson	York
Grant Russell	Waterloo
Juan Segovia	Concordia
Dan Simunic	British Columbia
Wally Smieliauskas	Toronto
Roger Tang	Calgary
Howard Teall	Wilfrid Laurier
John Waterhouse	Alberta
Louis Zanibbi	Laurentian
Daniel Zéghal	Ottawa

L'Association Canadienne des Professeurs de Comptabilité
The Canadian Academic Accounting Association

1988 Conference Program
University of Windsor

Tuesday May 31

8:00am-4:00pm	**REGISTRATION** **Location:** University Centre
7:00pm-10:00pm	**CAAA WELCOME RECEPTION** Sponsored by Canadian Institute of Chartered Accountants **Location:** Vanier East Dining Room, Vanier Hall

Wednesday June 1

7:15am-8:15am	**BREAKFAST** Sponsored by Irwin Dorsey of Canada **Location:** Oak Room, Vanier Hall
8:00am-4:00pm	**REGISTRATION** **Location:** University Centre
9:00am-9:15am	**WELCOME*** . Jeffrey Kantor, Chairman of Conference . Yvon Houle, President of CAAA . Eric West, Dean of Faculty of Business Administration, University of Windsor **Location:** Room 1101 Business Building
9:15am.-10:30am	**PLENARY SESSION*** Chairperson: Alex Milburn, Past President of CAAA Speaker: Gerhard Mueller, Washington University, President-Elect, American Accounting Association "Accounting Education and Scholarship in Developing Countries: What are our responsibilities?" Discussant: Dan McDonald, Simon Fraser University **Location:** Room 1101 Business Building

10:30am-10:45am **BREAK**

10:45am-12:15pm **CONCURRENT SESSIONS Ia and Ib**

****

SESSION Ia)* Refereed Papers

Chairperson: Andrée Lafortune, École des Hautes Études de Montréal

Anne Fortin, Université du Québec à Montréal

"French Accounting Thought As Reflected In The 1982 Accounting Plan"

Joel H. Amernic, University of Toronto

"Accounting As An Excuse For Interaction: Cases From Collective Bargaining"

Léo-Paul Lauzon, Université du Québec à Montréal

"Social Accounting In Canada"

Location: Room 1101 Business Building

****

SESSION Ib) Refereed Papers

Chairperson: Milou Erickson, Society of Management Accountants of Canada

Frank Dougherty and David Bateman, Saint Mary's University

"Avoiding The Trend Towards All Multiple-Choice Examinations In Accounting"

Robert Bloom, John Carroll University and M. Ahmed Naciri, Université du Québec à Montréal

"An Examination Of The Master's Degree Program In Accountancy"

M. Rai Kapoor, Concordia University

"C.A. Candidates: Their Attributes And Performance"

Location: Room 1123 Business Building

12:30pm-2:30pm **CAAA AWARDS LUNCHEON**
Sponsored by Certified General Accountants Association of Canada

Chairperson: Yvon Houle, President of CAAA

Speaker: Charles James, Executive Assistant to the President, University of Windsor

"Legal Issues Facing Academics"

Location: Vanier East Dining Room, Vanier Hall

2:45pm-4:15pm **CONCURRENT SESSIONS IIa) and IIb)**

****

SESSION IIa)* Refereed Papers

Chairperson: Harvey Mann, Brock University

Bruce A. La Rochelle and Farhad Simyar, Concordia University

"Power And Authority Relationships: Implications For Standard Setting In The Canadian Public Sector"

Andrée Lafortune, École des Hautes Études Commerciales de Montréal

"Le Développement des Systemes D'Information et la Participation des Vérificateurs"

T. L. Estrin, University of Windsor

"Roles Of The Information Preparer/Provider: Another Dimension Of AIS/MIS - Theory A"

Location: Room 1101 Business Building

****

SESSION IIb) Invited Education Committee Session

Chairperson: Derek Acland, Concordia University

Speakers: Howard Armitage, University of Waterloo
Efrim Boritz, University of Waterloo

"Creative Thinking and Problem Solving in Accounting Curricula"

Location: Room 1123 Business Building

****

4:15pm-4:30pm **BREAK**

4:30pm-5:45pm **CAAA ANNUAL MEETING***

Chairperson: Yvon Houle, President of CAAA

Location: Room 1101 Business Building

6:00pm-9:00pm **CAAA MEMBERS RECEPTION**
Sponsored by John Wiley & Sons

Location: Vanier East Dining Room, Vanier Hall

****

* These sessions will be conducted partially in English and partially in French. Accordingly simultaneous translation will be provided.

Thursday, June 2

9:00am-10:30am **CONCURRENT SESSIONS IIIa) and IIIb)**

****

SESSION IIIa) Refereed Papers

Chairperson: Alister K. Mason, Deloitte Haskins and Sells

Wally Smieliauskas and Lloyd Smith, University of Toronto

"Auditing And Evidence"

Howard D. Teall, Wilfrid Laurier University

"Canadian Evidence Of The Hotelling Valuation Principle"

George K. Kanaan, Concordia University, Thomas J. Linsmeier, University of Iowa and Gerald G. Lobo, University of Wisconsin - Madison

"Dispersion In Price Indices And The Relative Association Between SFAS 33 Income Measures And Security Returns"

Location: Room 1121 Business Building

****

SESSION IIIb) Invited Session

Chairperson: Murray Bryant, University of Toronto

Panel: Jerry Dermer, York University
George Gorelik, Certified General Accountants Association of Canada
William Langdon, Society of Management Accountants of Canada
Ralph Sykes, Doane Raymond

"Accounting Crises: Educational Implications"

Location: Room 1123 Business Building

****

10:30am-10:45am **BREAK**

10:45am-12:15pm **CONCURRENT SESSIONS IVa) and IVb)**

****

SESSION IVa) Refereed Papers

Chairperson: Sam Jopling, St. Mary's University

J. Fisher, Wilfrid Laurier University and R. McIntyre, University of Strathclyde

"The Impact Of Information Technology On The Accounting Profession: Some Preliminary Findings"

Paul V. Dunmore and Kelly F. Gheyara, Concordia University

"The Impact On Student Performance Of Using Computer Augmented Instructional Strategies In Selected Topics From Accounting Principles"

S. C. Beiner, Concordia University

"Transfer Pricing For Computer Services"

Location: Room 1121 Business Building

****

SESSION IVb) Invited Education Committee Session

Chairperson: Eldon Gardner, University of Lethbridge

Panel: Ross Archibald, University of Western Ontario
Dan McDonald, Simon Fraser University

"Accounting Case Writing Competition"

Location: Room 1123 Business Building

****

12:30pm-2:00pm **CAAA MEMBERS LUNCHEON**
Sponsored by the Society of Management Accountants of Canada

Chairperson: Irene Gordon, President-Elect of CAAA

Special Guest: Ron Ianni, President, University of Windsor

Location: Vanier East Dining Room, Vanier Hall

2:15pm-3:45pm **CONCURRENT SESSIONS Va) and Vb)**

****

SESSION Va) Refereed Papers

Chairperson: Michael Zin, University of Windsor

T. Ross Archibald and Darroch A. Robertson, The University of Western Ontario

"Financial Accounting Standards And The Indexing Of Pensions"

Morton Nelson, Wilfrid Laurier University

"Accounting For Investment Gains/Losses By Life Insurance Companies"

Location: Room 1121 Business Building

****

SESSION Vb) Invited Education Committee Session

Chairperson: Becky Reuber, University of Toronto

Panel: Len Fertuck, University of Toronto
William McCarthy, Michigan State University
Daniel Blake Rubenstein, Office of the Auditor General of Canada

"Information Systems and the Accounting Curriculum"

Location: Room 1123 Business Building

****

3:45pm-4:00pm **BREAK**

4:00pm-5:30pm **CONCURRENT SESSIONS VIa) and VIb)**

****

SESSION VIa) Refereed Papers

Chairperson: Daniel B. Thornton, University of Toronto

Richard Mattessich, University of British Columbia

"Counting, Accounting, And The Input-Output Principle: Recent Archeological Evidence Revising Our View On The Evolution Of Early Record Keeping"

Claude P. Lanfranconi and Darroch A. Robertson, The University of Western Ontario

"The Disclosure Of Tax Loss Carryforwards And Their Subsequent Realization"

Andreas Charitou, University of Toronto

"Valuation Of The Components Of Earnings And Cash Flows: A Cross-Sectional Investigation"

Location: Room 1121 Business Building

****

SESSION VIb) Invited Session

Chairperson: Alan Macnaughton, University of Waterloo

Panel: Charles W. Swenson, University of Southern California
Michael Wolfson, Statistics Canada

"New Methodologies in Tax Research"

Location: Room 1123 Business Building

****

L'Association Canadienne des Professeurs de Comptabilité
The Canadian Academic Accounting Association

PROGRAMME DU CONGRES 1988
UNIVERSITY OF WINDSOR

Mardi, 31 mai

8h.00-16h.00	**INSCRIPTION** **Endroit:** University Centre
19h.00-22h.00	**RÉCEPTION DE BIENVENUE DE L'A.C.P.C.** Patronnée par l'Institut canadien des comptables agréés **Endroit:** Vanier East Dining Room, Vanier Hall

Mercredi, 1er juin

7h.15-8h.15	**PETIT DÉJEUNER** Patronné par Irwin Dorsey of Canada **Endroit:** Oak Room, Vanier Hall
8h.00-16h.00	**INSCRIPTION** **Endroit:** University Centre
9h.00-9h.15	**BIENVENUE*** . Jeffrey Kantor, président du congrès . Yvon Houle, président de l'A.C.P.C. . Eric West, Doyen, Faculty of Business Administration, University of Windsor **Endroit:** salle 1101, Business Building
9h.15-10h.30	**SÉANCE PLÉNIERE*** Président: Alex Milburn, président sortant de l'A.C.P.C. Conférencier: Gerhard Mueller, Washington University, président désigné, American Accounting Association "Accounting Education and Scholarship in Developing Countries: What are our Responsibilities?" Participant: Dan McDonald, Simon Fraser University **Endroit:** salle 1101, Business Building

10h.30-10h.45 **PAUSE**

10h.45-12h.15 **SÉANCES CONCOMITANTES Ia) ET Ib)**

****

SÉANCE Ia)*

Président: Andrée Lafortune, École des Hautes Études Commerciales de Montréal

Anne Fortin, Université du Québec à Montréal

"French Accounting Thought As Reflected in the 1982 Accounting Plan"

Joel H. Amernic, University of Toronto

"Accounting as an Excuse for Interaction: Cases from Collective Bargaining"

Léo-Paul Lauzon, Université du Québec à Montréal

"Social Accounting in Canada"

Endroit: salle 1101, Business Building

****

SÉANCE Ib)

Président: Milou Erickson, Society of Management Accountants of Canada

Frank Dougherty et David Bateman, Saint Mary's University

"Avoiding the Trend Towards All Multiple-Choice Examinations in Accounting"

Robert Bloom, John Carroll University et Ahmed Naciri, Université du Québec à Montréal

"An Examination of the Master's Degree Program in Accountancy"

M. Rai Kapoor, Concordia University

"C.A. Candidates: Their Attributes and Performance"

Endroit: salle 1123, Business Building

12h.30-14h.30 **DÉJEUNER DES PRIX DE L'A.C.P.C.**
Patronné par The Certified General Accountants Association of Canada

Président: Yvon Houle, président de 1'A.C.P.C.

Conférencier: Charles James, adjoint exécutif au président, University of Windsor

"Legal Issues Facing Academics"

Endroit: Vanier East Dining Room, Vanier Hall

14h.45-16h.15 **SÉANCES CONCOMITANTES IIa) ET IIb)**

****

SÉANCE IIa)*

Président: Harvey Mann, Brock University

Bruce A. La Rochelle et Farhad Simyar, Concordia University

"Power and Authority Relationships: Implications for Standard Setting in the Canadian Public Sector"

Andrée Lafortune, École des Hautes Études Commerciales de Montréal

"Le développement des systèmes d'information et la participation des vérificateurs"

T.L. Estrin, University of Windsor

"Roles of the Information: Preparer/Provider Another Dimension of AIS/MIS: -Theory A"

Endroit: salle 1101, Business Building

****

SÉANCE IIb)

Président: Derek Acland, Concordia University

Conférenciers: Howard Armitage, University of Waterloo
Efrim Boritz, University of Waterloo

"Creative Thinking and Problem Solving in Accounting Curricula"

Endroit: salle 1123, Business Building

****

16h.15-16h.30 **PAUSE**

16h.30-17h.45 **ASSEMBLÉE ANNUELLE DE L'A.C.P.C.***

Président: Yvon HOULE, président de 1'A.C.P.C.

Endroit: salle 1101, Business Building

18h.00-21h.00 **RÉCEPTION DES MEMBRES DE L'A.C.P.C.**
Patronnée par John Wiley & Sons

Endroit: Vanier East Dining Room, Vanier Hall

****

---

* Ces séances bénéficient du service de traduction simultanée.

Jeudi, 2 juin

9h.00-10h.30 **SÉANCES CONCOMITANTES IIIa) ET IIIb)**

****

SÉANCE IIIa)

Président: Alister K. Mason, Deloitte Haskins & Sells

Wally Smieliauskas et Lloyd Smith, University of Toronto

"Auditing and Evidence"

Howard D. Teall, Wilfrid Laurier University

"Canadian Evidence of the Hotelling Valuation Principle"

George K. Kanaan, Concordia University, Thomas J. Linsmeier, University of Iowa et Gerald G. Lobo, University of Wisconsin - Madison

"Dispersion in Price Indices and the Relative Association Between SFAS 33 Income Measures and Security Returns"

Endroit: salle 1121, Business Building

****

SÉANCE IIIb)

Président: Murray Bryant, University of Toronto

Participants: Jerry Dermer, York University
George Gorelik, The Certified General Accountants Association of Canada
William Langdon, Société des comptables en management du Canada
Ralph Sykes, Doane Raymond

"Accounting Crises: Educational Implications"

Endroit: salle 1123, Business Building

****

10h.30-10h.45 **PAUSE**

10h.45-12h.15 **SÉANCES CONCOMITANTES IVa) ET IVb)**

****

SÉANCE IVa)

Président: Sam Joplin, St. Mary's University

J. Fisher, Wilfrid Laurier University et R. McIntyre, University of Strathclyde

"The Impact of Information Technology on the Accounting Profession: Some Preliminary Findings"

Paul V. Dunmore et Kelly F. Gheyara, Concordia University

"The Impact on Student Performance of Using Computer Augmented Instructional Strategies in Selected Topics from Accounting Principles"

S.C. Beiner, Concordia University

"Transfer Pricing for Computer Services"

Endroit: salle 1121, Business Building

****

SÉANCE IVb)

Président: Eldon Gardner, University of Lethbridge

Participants: Ross Archibald, University of Western Ontario
Dan McDonald, Simon Fraser University

"Accounting Case Writing Competition"

Endroit: salle 1123, Business Building

****

12h.30-14h.00 **DÉJEUNER DES MEMBRES DE L'A.C.P.C.**
Patronné par la Société des comptables en management du Canada

Présidente: Irene Gordon, présidente désignée de 1'A.C.P.C.

Invité spécial: Ron Ianni, président, University Windsor

Endroit: Vanier East Dining Room, Vanier Hall

14h.15-15h.45 **SÉANCES CONCOMITANTES Va) ET Vb)**

****

SÉANCE Va)

Président: Michael Zin, University of Windsor

T. Ross Archibald et Darroch A. Robertson, University of Western Ontario

"Financial Accounting Standards and the Indexing of Pensions"

Morton Nelson, Wilfrid Laurier University

"Accounting for Investment Gains/Losses by Life Insurance Companies"

Endroit: salle 1121, Business Building

****

SÉANCE Vb)

Présidente: Becky Reuber, University of Toronto

Participants: Len Fertuck, University of Toronto
William McCarthy, Michigan State University
Daniel Blake Rubenstein, Bureau du Vérificateur Général du Canada

"Information Systems and the Accounting Curriculum"

Endroit: salle 1123, Business Building

****

15h.45-16h.00 **PAUSE**

16h.00-17h.30 **SÉANCES CONCOMITANTES VIa) ET VIb)**

****

SÉANCE VIa)

Président: Daniel B. Thornton, University of Toronto

Richard Mattessich, University of British Columbia

"Counting, Accounting, and the Input-Output Principle: Recent Archeological Evidence Revising Our View on the Evolution of Early Record Keeping"

Claude P. Lanfranconi et Darroch A. Robertson, University of Western Ontario

"The Disclosure of Tax Loss Carryforwards and their Subsequent Realization"

Andreas Charitou, University of Toronto

"Valuation of the Components of Earnings and Cash Flows: A Cross-Sectional Investigation"

Endroit: salle 1121, Business Building

****

SÉANCE VIb)

Président: Alan Macnaughton, University of Waterloo

Participants: Charles W. Swenson, University of Southern California
Michael Wolfson, Statistique Canada

"New Methodologies in Tax Research"

Endroit: salle 1123, Business Building

****

L'Association Canadienne des Professeurs de Comptabilité
The Canadian Academic Accounting Association

ABSTRACTS/RESUMES

1988 CAAA ANNUAL CONFERENCE/CONGRÈS 1988 DE L'A.C.P.C.

THE UNIVERSITY OF WINDSOR/L'UNIVERSITÉ DE WINDSOR

ACPC Secrétariat / CAAA Secretariat (416) 978-4273
Faculty of Management, University of Toronto, 246 Bloor Street West, Toronto, Ontario, Canada M5S 1V4

S E S S I O N

I A

R O O M

1 1 0 1

R E F E R E E D

P A P E R S

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Anne Fortin
Université du Québec à Montréal

French Accounting Thought As Reflected in the 1982 Accounting Plan

En France, les principes et pratiques comptables sont codifiés dans le plan comptable de 1982. Le plan élabore les modalités comptables contenues dans la loi comptable du 30 avril 1983. Cette loi fut adoptée en vue d'harmoniser les états financiers français avec ceux des autres pays de la communauté économique européenne.

Le premier plan comptable français date de 1942 et la version 1957 du plan a eu une influence marquée au niveau international. Au cours des années 1970, le plan 1957 fut révisé. Cette révision s'effectua en deux étapes. La première, de 1970 à février 1975, permit l'élaboration d'un cadre conceptuel autour duquel s'articulaient les états financiers. Durant la deuxième étape, de 1977 à 1979, les résultats du processus européen d'harmonisation des états financiers durent être pris en considération suite à l'adoption de la quatrième directive en 1978, et le produit de la première phase de la révision fut modifié conformément aux exigences européennes.

La conférence inclura une présentation des influences majeures sur le développement de la comptabilité française jusqu'en 1970, ainsi qu'une description du processus et du résultat de la révision du Plan 1957, c'est-à-dire, le Plan 1982 et son cadre conceptuel.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Anne Fortin
Université du Québec à Montréal

French Accounting Thought as Reflected in the 1982 Accounting Plan

French accounting is codified in the 1982 Accounting Plan. The plan details the provision of the April 30, 1983 accounting law that was adopted to harmonize French accounting with that of other European Economic Community countries. France's first accounting plan dates back to 1942 and its 1957 version had quite an influence internationally. In the 1970's, the 1957 version of the accounting plan was revised. The two-step revision of the Plan lasted nearly ten years. Major conceptual innovations emerged from the first period of the revision, from 1970 to February 1975. In the second period, from 1977 to 1979, the results of the European harmonization process were taken into consideration, and the Accounting Plan produced in the first part of the revision was adapted to incorporate the European fourth directive whose final version had been adopted in 1978. The presentation will provide an overview of the main influences on the development of French Accounting up to the 1970's together with a description of the process and outcome of the revision of 1957 Plan (namely, the 1982 Accounting Plan and its conceptual framework).

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Joel H. Amernic
University of Toronto

Accounting as an Excuse for Interaction: Cases from Collective Bargaining

L'on explore dans cet exposé les façons dont l'information et les processus comptables interagissent avec la négociation collective, dans le cadre d'études de cas provenant du secteur des organismes sans but lucratif. L'on définit dans l'introduction les résultats prévus, tandis que l'on décrit dans la section suivante les divers mécanismes qui ont servi à la collecte des données. La troisième section de l'exposé contient une description détaillée des quatre études de cas et porte plus particulièrement sur les rôles de la comptabilité à mesure qu'évolue la relation entre les parties adverses. Dans la dernière section, les études de cas servent de fondement à l'élaboration d'une théorie préliminaire centrée sur la notion voulant que la comptabilité puisse en partie servir d'« excuse » grâce à laquelle des groupes qui ont essentiellement des relations d'opposants les uns avec les autres peuvent en arriver à s'engager dans des négociations. Pareil point de vue tranche avec les écrits plus normatifs qui ont tendance à insister sur le rôle que pourrait jouer l'information comptable dans l'amélioration des décisions des participants à la négociation collective.

Bien qu'elle ne fasse pas partie du document officiel, une dernière section de l'exposé porte sur la question des travaux de recherche portant sur des cas en tant que tels. L'on y trouve une brève description et une courte analyse des réactions des divers lecteurs d'une version précédente du document qui fait l'objet de cet exposé.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Joel H. Amernic
University of Toronto

Accounting as an Excuse for Interaction:

Cases from Collective Bargaining

In this paper, the ways that accounting information and processes interact with collective bargaining is explored by means of case studies drawn from the not-for-profit sector. An introductory section sets out tentative expectations, and the next section describes the various means by which data was collected. The third section of the paper provides a detailed description of the four case studies, focusing on the roles of accounting as the relationship between the competing sides unfolds. A final section builds upon the cases by developing a preliminary theory which centres on the notion that accounting may partly serve as an "excuse" by means of which groups in essentially adversarial relationships with one another, might enable themselves to engage in negotiations. Such a view stands in contrast to the more normative literature, which tends to emphasize the role which accounting information could have in improving the decisions of participants in collective bargaining.

Although not part of the formal paper, a final part of the presentation focuses on the issue of "case" research itself. A brief description and analysis of the reactions of various readers of an earlier version of the above paper is presented and discussed.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Leo-Paul Lauzon
Université du Québec à Montréal

Social Accounting in Canada

La présente étude fait état des résultats d'une analyse comparative (1980 et 1985) du contenu en information sociale de 548 rapports annuels des plus grandes sociétés canadiennes ouvertes et étatiques. L'auteur décrit la méthodologie de recherche utilisée et la grille d'évaluation élaborée.

Pour les fins de cette étude, l'auteur a analysé et évalué 163 types d'information sociale différents. En dernier lieu, les résultats obtenus par les différentes firmes canadiennes au niveau de la publication d'information sociale dans leur rapport annuel, seront corrélés avec onze variables différentes telles que la taille de l'enterprise, son coefficient d'endettement, son taux de rentabilité, son contrôle juridique, l'emplacement de son siège social, etc.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Leo-Paul Lauzon
Université du Québec à Montréal

Social Accounting in Canada

This study presents the results of a comparative analysis (1980 to 1985) of the social data contained in 548 annual reports of the largest Canadian corporations, both public and state-owned. The author describes the research methodology and the assessment scale used.

The study consisted of the analysis and assessment of 163 types of social data. This social data, gathered from the annual reports of the corporations under study, was correlated with eleven different independent variables such as size of the firm, its indebtedness ratio, its profitability rate, type of legal control, location of the head office, etc.

S E S S I O N

I B

R O O M

1 1 2 3

R E F E R E E D

P A P E R S

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Frank Dougherty
David Bateman
Saint Mary's University

Avoiding the Trend Towards All Multiple-Choice Examinations in Accounting

L'on traite dans cet exposé de la question délicate et controversée du mode d'examen (choix multiples par opposition aux questions à développement) le plus approprié pour contrôler le niveau de connaissances des étudiants en comptabilité (tant professionnels qu'universitaires). Après avoir passé en revue les écrits portant sur cette question, les auteurs en viennent à la conclusion que les travaux de recherche n'ont pas clairement démontré qu'un mode de contrôle était préférable à l'autre. Les auteurs affirment qu'une grande part de la controverse qui entoure cette question découle de l'imprécision des objectifs du processus d'examen sur lesquels il convient de se pencher de façon appropriée. Des études récentes des *Professional Accounting Examinations* des États-Unis (C.P.A.) ont mené à la conclusion que l'on pouvait administrer des examens entièrement composés de questions à choix multiples. Les auteurs font cependant une mise en garde : la fiabilité des examens à choix multiples n'est pas un substitut à leur pertinence par rapport aux objectifs du processus d'enseignement, c'est-à-dire produire des comptables bien formés qui ont la capacité d'analyser et de scruter les problèmes et de communiquer de façon efficace leurs solutions à un public intéressé.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Frank Dougherty
David Bateman
Saint Mary's University

Avoiding the Trend Towards All Multiple-Choice Examinations in Accounting

This paper discusses the delicate and controversial issue of which method of examination (multiple-choice versus essay problems) is most appropriate for testing the knowledge level of accounting students (both professional and university). The authors' review of the literature indicates that research has not clearly indicated any one testing method as being superior. The authors argue that much of the controversy around this issue stems from unclear objectives of the examination process which must be properly addressed. Recent studies of U.S. Professional Accounting Examinations (C.P.A.) have concluded that 100% multiple-choice examinations should be conducted. The authors caution that the reliability of multiple-choice examinations is not a substitute for relevance to the objectives of the education process, i.e., to produce educated accountants who have the ability to analyze and research problems and to effectively communicate their solutions to an interested public.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Robert Bloom
John Carroll University
M. Ahmed Naciri
University of Quebec in Montreal

An Examination of the Master's Degree Program in Accountancy

Depuis quelques années, l'on s'intéresse beaucoup à la création de programmes de maîtrise en sciences comptables (M.Sc.) dans deux universités montréalaises - l'Université du Québec à Montréal (UQAM) et l'université Concordia. En fait, ce programme a déjà été établi à l'UQAM. C'est pourquoi, l'on examine dans le présent exposé l'évolution récente des programmes de maîtrise en sciences comptables et de maîtrise en comptabilité (M.compt.) en Amérique du Nord. L'on présente les données de base relatives à plusieurs de ces programmes aux États-Unis et au Canada, et l'on examine la raison d'être de ces programmes et les attentes qui s'y rattachent. L'on met en outre en opposition la nature et les objectifs des programmes de ce genre qui existent actuellement et ceux des programmes de MBA et des programmes menant à l'obtention du diplôme de comptable agréé. De nombreux programmes de maîtrise en comptabilité sont mis en parallèle et les problèmes liés à l'élaboration et à la mise en place de ces programmes sont étudiés.

Il semble y avoir de nombreux programmes de MBA en Amérique du Nord, y compris des programmes d'études allégés, non accrédités. Depuis quelques années, les programmes de MBA, compte tenu de l'importance qu'ils attachent à la formation générale en management, ont perdu beaucoup de leur prestige. Quoi qu'il en soit, peu de programmes de MBA débouchent sur des concentrations ou des majeures en comptabilité.

La raison d'être du programme de maîtrise en comptabilité (quel que soit le nom qu'on lui donne - maîtrise en sciences comptables ou maîtrise en comptabilité) est le besoin croissant d'une spécialisation intensive en comptabilité au niveau des programmes d'études supérieures. Les études de premier cycle, les baccalauréats en comptabilité sont invariablement axés sur l'obtention de titres professionnels, celui de C.A. ou d'autres. Les programmes menant au diplôme de C.A. sont axés sur la préparation des candidats à l'examen des C.A., mettant en relief la pratique existante par rapport à la pratique future, et ne mènent pas à des diplômes universitaires. En outre, alors que les programmes de MBA et de C.A. ont une orientation nettement professionnelle, bon nombre de programmes de maîtrise en comptabilité comportent une dimension recherche, visant à former les étudiants à réaliser des travaux de recherche dans le vaste domaine de la comptabilité. De plus, un programme de maîtrise en comptabilité peut servir de canal d'alimentation ou de prélude aux programmes de doctorat. Dans une autre perspective, le programme de maîtrise en comptabilité peut être conçu de façon à s'articuler aux programmes de doctorat existants en gestion, et peut être adapté aux besoins de chaque étudiant.

Les objectifs d'un tel programme de maîtrise devraient à notre avis comprendre les éléments suivants:

1) prévoir un programme d'études détaillé, principalement axé sur les notions, les théories, les techniques d'analyse, la méthodologie de recherche et les applications;
2) permettre à l'étudiante de se spécialiser dans un domaine particulier de la comptabilité - finance, gestion, vérification, organismes sans but lucratif;
3) combler la pénurie aiguë de professeurs compétents en sciences comptables aux niveaux universitaire et collégial;
4) former des comptables à l'intention des départements de recherche et des conseillers en comptabilité à l'intention des services de conseil-gestion des principaux cabinets d'experts-comptables.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Robert Bloom
John Carroll University
M. Ahmed Naciri
University of Quebec in Montreal

An Examination of the Master's Degree Program in Accountancy

In recent years, there has been much consideration about instituting Master of Science (M.Sc.) programs in Accountancy at two Montreal universities--the University of Quebec at Montreal (UQAM) and Concordia University. Indeed, such a program has already been established at UQAM. Accordingly, in this paper, we examine the recent development of Master of Science in Accountancy and Master of Accountancy (M.Acc.) programs in North America. Background information on several of these programs in the United States and Canada is furnished. The rationale and expectations for these programs are examined. Additionally, the nature and objectives of such existing programs are contrasted with MBA programs and Chartered Accountancy diploma programs. We compare a number of masters programs in accountancy and examine the problems of developing and introducing such programs.

There appear to be many MBA programs in North America, including diluted, unaccredited courses of study. In recent years, MBA programs, in view of their emphasis on generalized management education, have been losing much of their lustre. Be that as it may, few MBA programs are producing accounting concentrators or majors.

The rationale for master's program in accountancy (call it what you will: Master of Science in Accountancy, Master of Accountancy) is the increasing need for intensive accounting specialization at the graduate level. Undergraduate, Bachelor of Commerce, degrees in Accountancy invariably have a professional, CA (or other) examination orientation. CA diploma programs are concerned with the preparation of candidates for the CA examination, stressing existing as opposed to future practice, and do not grant graduate degrees. Additionally, while MBA and CA programs have a decidedly professional focus, a number of masters in accountancy programs have a research dimension, endeavoring to educate students to do research in the broad realm of accountancy. Moreover, a master's program in Accountancy can serve as a feeder or prelude to university Ph.D. programs. Put another way, a masters in accountancy can be developed so as to articulate with existing doctoral programs in business, and can be tailor-made to fit the needs of each student.

The objectives of such a master's program in our view should include the following:

(1) to provide an in-depth course study, emphasizing concepts, theories, analytical techniques, research methodology, and applications.

(2) to enable the student to specialize in a particular area of accountancy--e.g., financial, managerial, auditing, not-for-profit.

(3) to alleviate the acute shortage of qualified accountancy professors at the university and college levels.

(4) to educate "technical" accountants for research departments and accounting consultants for management advisory service departments in major accountancy firms.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

M. Rai Kapoor
Concordia University

C.A. Candidates: Their Attributes and Performance

L'on fait état dans cet exposé des résultats d'une analyse de la formation et du rendement de 633 candidats, qui ont subi pour la première fois l'examen final uniforme des comptables agréés dans la province de Québec en septembre 1984. Ces résultats révèlent que les notes moyennes obtenues pour les cours de formation générale, de gestion générale, de comptabilité, les cours du programme menant à l'obtention d'un diplôme et les cours du programme de C.A. sont celles qui révèlent la relation la plus marquée avec le rendement global à l'examen. La proportion élevée d'échecs à l'examen pourrait donc s'expliquer par la qualité plutôt faible des étudiants; le candidat moyen qui a subi l'examen final uniforme au Québec avait une note moyenne de B-. L'élément formation générale de leurs programmes de premier cycle était également largement inférieur aux niveaux recommandés par la plupart des études sur l'enseignement de la comptabilité.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

M. Rai Kapoor
Concordia University

C.A. Candidates: Their Attributes and Performance

This study reports the results of an analysis of the backgrounds and performances of 633 candidates, who took the Uniform Final Examination for chartered accountants for the first time in the Province of Quebec in September 1984. Findings indicate that the Grade Point Averages (GPA) for general education, general business, accounting, the degree program and the CA diploma courses are most related to the overall examination performance. The high failure rate in the examination could thus be traced to the rather low quality of students; the average candidate writing the Uniform Final Examination in Quebec had a B- standing. The general education component of their undergraduate degree programs was also much below the levels recommended by most studies on accounting education.

S E S S I O N

II A

R O O M

1 1 0 1

R E F E R E E D

P A P E R S

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Bruce A. La Rochelle
Farhad Simyar
Concordia University

Power and Authority Relationships: Implications for Standard Setting in the Canadian Public Sector

Depuis quelques années, le Comité sur la comptabilité et la vérification des organismes du secteur public de l'Institut Canadi n des Comptables Agréés a émis plusieurs prises de position en « publi[ant], de sa propre autorité, les prises de position qu'il juge être dans le meilleur intérêt du public » (Préface des recommandations concernant la comptabilité et la vérification des organismes du secteur public, 1986). Le présent exposé a pour but d'examiner le rôle de ce comité et la mesure dans laquelle il pourrait influencer les normes de comptabilité dans le secteur public. Les relations de pouvoir et d'autorité sont mises en toile de fond, et l'on insiste sur l'évolution du cadre conceptuel dans le secteur privé et sur ses conséquences pour une évolution comparable dans le secteur public. L'évolution dans le secteur public aux États-Unis est en outre comparée à celle du Canada.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Bruce A. La Rochelle
Farhad Simyar
Concordia University

Power and Authority Relationships: Implications for Standard Setting in the Canadian Public Sector

In recent years, the Public Sector Accounting and Auditing Committee of the Canadian Institute of Chartered Accountants has issued several pronouncements, "render(ing) on its own authority such pronouncements as it considers in the best interest of the community as a whole" (Introduction to Public Sector Accounting and Auditing Recommendations, 1986). The purpose of this paper is to examine the role of the Committee and its potential for influencing accounting standards in the public sector. Power and authority relationships are canvassed, with emphasis on the conceptual framework developments in the private sector and the implications for comparable developments in the public sector. In addition, public sector developments in the United States are compared with those of Canada.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Andréé Lafortune
Ecole des Hautes Etudes Commerciales

Le Développement des Systèmes D'information et la Participation des Vérificateurs

Les gestionnaires sont inquiets face au phénomène d'informatisation de leur entreprise, phénomène dont ils se sentent souvent spectateurs. L'une de leurs préoccupations premières est que cette informatisation n'augmente les risques et les éventualités de perte pour l'organisation, que ce soit lors du développement du système ou lors de son utilisation. Le système doit donc être contrôlé et doit comporter des contrôles. Il semble plus efficace et moins coûteux de concevoir ces divers contrôles en même temps que le système plutôt qu'après son implantation. De ce raisonnement découle la participation de vérificateurs au développement de systèmes puisqu'ils assument souvent le rôle d'experts en contrôle pour les organisations.

Que pensent les dirigeants d'entreprises de la participation des vérificateurs au développement de systèmes d'information? Il nous paraît important de connaître leur opinion puisque ce sont eux qui décident des priorités de l'organisation selon leurs objectifs et préoccupations et qui approuveront ou non la participation de vérificateurs. Le gestionnaire pourra envisager de faire participer au développement de systèmes le vérificateur interne, et/ou un vérificateur externe, et/ou un vérificateur externe non impliqué dans la vérification des livres de l'entreprise.

Notre modèle permet de formuler les hypothèses suivantes:
H1: Selon que le système développé soit un système d'information comptable ou un système d'information de gestion, les dirigeants d'entreprise prôneront une participation différente des vérificateurs au développement de systèmes
H2: Selon que la fonction des gestionnaires soit reliée à la comptabilité, à l'informatique ou à l'administration générale, ceux-ci prôneront une participation différente des vérificateurs au développement de systèmes
H3: Selon que l'entreprise à laquelle sont rattachés les gestionnaires soit une PME ou une grande entreprise, ceux-ci prôneront une participation différente des vérificateurs au développement de systèmes.

Le questionnaire qui fut élaboré présente divers risques que la littérature associe au développement de systèmes d'information. Le répondant est invité à juger de l'importance du risque et à indiquer s'il ferait ou non participer des vérificateurs dans l'équipe de développement d'un système d'information, selon qu'il s'agisse d'un système d'information comptable ou d'un système d'information de gestion. Le questionnaire a été transmis par la poste à 300 gestionnaires de haut niveau et le taux de réponse s'établit à 23%.

Les résultats obtenus indiquent que les gestionnaires prônent une participation différente selon le système développé: ils sont assez favorables à la participation des vérificateurs et ils le sont davantage pour un système d'information comptable; pour chacun des risques, le vérificateur interne est impliqué dans plus de 50% des réponses, la participation du vérificateur externe recueillant moins d'adhèsion. Les résultats révèlent aussi des différences significatives liées à la fonction de gestionnaire et à la taille de l'entreprise.

Cette recherche à caractère exploratoire laisse entrevoir de nombreuses interrogations et implications.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Andrée Lafortune
Ecole des Hautes Etudes Commerciales

Le Développement des Systèmes D'information et la Participation des Vérificateurs

Managers are worried by the computerization of their companies and often feel purely like spectators to its occurrence. One of their primary concerns is that computerization increases the risks and future losses to which the organization is exposed, during both system development and implementation. Thus, the system must be monitored and provide for controls. It seems more effective and less expensive to set up these controls while designing the system rather than wait until after its implementation. Therefore auditors should be involved in system development, as they often act as control experts for organizations.

What do business managers think about auditors being involved in information system development? It is important to know their opinion, because they are the ones who make decisions about an organization's priorities, according to their objectives and concerns, as well as being the ones who will agree or disagree with the involvement of auditors. The manager may consider the participation of the internal auditor, and/or an external auditor, and/or an external auditor who does not take part in the auditing of the company's books.

Our model suggests the following hypotheses:
H1: Depending on whether the system development is an accounting information system, business managers will recommend a different level of involvement by the auditors in system development.
H2: Depending on whether the managers' tasks are related to accounting, data processing or administration in general, they will recommend a different level of involvement by the auditors in system development.
H3: Depending on whether the entity to which belong the managers is small or big, they will recommend a different level of involvement by the auditors in system development.

The questionnaire that was prepared deals with various risks that the literature suggests are closely linked to information system development. Respondents are encouraged to judge risk magnitude and to indicate if they think auditors should be members of the group responsible for information system development, depending on whether accounting or management information systems are concerned. The questionnaire was mailed to 300 senior managers and the rate of response stands at 23 %.

Findings indicate that managers recommend involvement in different forms according to the system being developed: managers are rather favorable to the involvement of auditors and even more favorable to their involvement in an accounting information system. For each of the risks, the internal auditor is welcomed in more than 50 % of the responses, but the involvement of external auditor earns less support. Findings also show significant differences according to the manager's task and the size of the enterprise.

This exploratory research suggests that there are many questions and implications for the future.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Tev Estrin
University of Windsor

Roles of the Information Preparer/Provider

Another Dimension of AIS/MIS

Cet exposé commence par une analyse de l'affirmation selon laquelle l'information comptable est le fondement des décisions de gestion. Compte tenu de cet objectif, l'on peut mesurer la valeur fondamentale de la comptabilité à sa capacité d'influer sur les décisions. Les tendances du chiffre d'affaires, les coûts et les tendances des coûts que l'on recueille de façon systématique et que l'on analyse grâce au système d'information comptable révèlent des possibilités ou fournissent les paramètres des problèmes de gestion et mettent sur la voie de leur solution. Pourtant, l'on déplore souvent dans la pratique que ni la définition du problème ni la solution indiquée par l'information comptable n'est acceptée ou utilisée par les gestionnaires à qui incombe la prise de décisions d'importance majeure.

Ce qui pourrait expliquer cette indifférence, suggère-t-on, c'est que l'information comptable est tenue par les comptables pour être le véritable reflet de la réalité. Dans cette optique, si le chiffre attribué au coût d'un produit est inexact, loin d'être ignoré, il devrait être corrigé et utilisé ensuite dans la prise de décisions. Par opposition, dans la pratique, le décideur se trouve devant de nombreux éléments d'information différents et contradictoires provenant de diverses sources dont l'acceptation est conditionnelle. Mais avant d'utiliser l'information disponible, l'une des principales tâches qui lui incombe est de mesurer la valeur de chaque source et de déterminer quelle est la meilleure façon de l'utiliser. Cette pratique, qui constitue le fondement de la mise au point des systèmes experts, est en général ignorée dans l'enseignement de la comptabilité et dans la recherche en comptabilité.

Il est depuis longtemps reconnu dans les études en communication que la source d'une communication est un facteur déterminant dans l'influence qu'elle exerce sur celui à qui elle s'adresse. C'est là le sujet de nombreux travaux de recherche dans ce domaine. De la même façon, les analyses de l'incidence des diverses sources d'information de gestion comptable et numérique devraient permettre de comprendre les principes de l'utilisation et de la valeur de cette information. Les travaux de recherche comptable dans ce domaine sont cependant très peu nombreux et, à toutes fins utiles, rien n'apparaît sur le sujet dans les manuels d'usage courant. C'est pourquoi cet exposé a pour but de repousser les limites de cette importante avenue de la recherche comptable.

Après avoir examiné le contexte et l'importance du problème, l'on pose un modèle du rôle de l'information dans les décisions de gestion, en indiquant quels sont les rôles respectifs de l'auteur et de l'utilisateur de l'information. On note dans ce modèle un facteur capital : celui des structures de rétribution de l'auteur et de l'utilisateur qui font également l'objet d'un diagramme et d'une analyse. On classe ensuite les auteurs de l'information en dix catégories, différenciées en fonction des dimensions de la rétribution, ainsi que des relations avec l'utilisateur, l'entreprise et les organismes externes.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Tev Estrin
University of Windsor

Roles of the Information Preparer/Provider

Another Dimension of AIS/MIS

The paper begins by examining the claim that accounting information is the basis of business decisions. Given this objective, the fundamental worth of accounting can be measured by its ability to influence decisions. Sales trends, costs and cost trends gathered systematically and analyzed by the accounting information system indicate opportunities or frame business problems and point to their solutions. Yet it is often a complaint in practice that neither the problem definition nor the solution indicated by the accounting information is accepted or used by the managers who are responsible for making higher level decisions.

The suggestion is made that a reason for this disregard is that accounting information is held by accountants to be a true reflection of reality, independent and without regard to its source. In this view, if the figure given for the costs of a product is wrong, it should be corrected and then used for a decision but not disregarded. By contrast, in practice, a decision-maker is faced with many diverse and conflicting pieces of information from various sources which are conditionally accepted. But before using information provided, one of the major tasks is to weight the worth of each source and determine how best it can be used. Such a practice, a basis of expert systems development, is generally ignored in accounting teaching and research.

It has long been accepted in Communications Studies that the source of a communication is a major factor in the influence of that information on the recipient. It is the subject of a great deal of research in this area. Similarly, analyses of the effect of the various sources of accounting and numerical, management information should be key to understanding the use and value of such information. However, there is very little accounting research in this field and virtually nothing about the subject in standard textbooks. Therefore, this paper is aimed at expanding this important area of accounting research.

After examining the background and importance of the problem, the paper posits a model of the role of information in managerial decisions, indicating the roles of information preparer and information user. A critical factor in this model is the reward structures of the provider and the user which are also diagrammed and discussed. Next, ten classifications of information provider, are given, differentiated along the dimensions of reward, as well as relations with the user, the business entity and external organizations.

S E S S I O N

III A

R O O M

1 1 2 1

R E F E R E E D

P A P E R S

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Wally Smieliauskas
Lloyd Smith
University of Toronto

Auditing and Evidence

Cet exposé porte sur une branche de la recherche qui a pris naissance au cours des années 60 et 70 et qui a trait à l'élaboration d'une théorie de la vérification. L'on s'intéresse plus précisément au raffinement d'une théorie de l'information probante en vérification, à la lumière des récents travaux de recherche en philosophie de la science. Le résultat principal de cette étude est l'amélioration de la définition de la preuve du type confirmation et l'établissement d'une relation entre ce résultat et les diverses opinions des vérificateurs. Ces travaux ont, entre autres, une conséquence : la recherche sur les systèmes experts en vérification, fondée sur les travaux antérieurs relatifs à l'information probante en vérification, risque de ne pas mener à des aides appropriées à la décision dans l'optique de la philosophie de la science. Une autre de leurs conséquences est que les responsables de l'établissement de normes professionnelles de vérification devraient s'intéresser davantage à l'explication sous-jacente aux évaluations en vérification plutôt qu'au type d'évaluations qui doivent être effectuées.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Wally Smieliauskas
Lloyd Smith
University of Toronto

Auditing and Evidence

This paper resumes a line of research begun in the 60's and 70's concerning the development of a theory of auditing. Specifically we focus on refining a theory of audit evidence in light of recent research in philosophy of science. Our major finding is to improve the definition of confirming evidence and relate this to various audit opinions. An implication of our work is that expert systems research in auditing based on previous research on audit evidence may not lead to appropriate decision aids from a philosophy of science perspective. Another implication is that audit professional standard setting should focus more on explanation underlying audit assessments rather than on the type of assessments that need to be made.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Howard D. Teall
Wilfrid Laurier University

Canadian Evidence of the Hotelling Valuation Principle

Cet exposé a pour but de fournir d'autres preuves à l'appui du principe d'évaluation de hotelling [HVP] à partir de l'information présentée dans les rapports annuels des sociétés pétrolières et gazières canadiennes d'exploration et de développement. Selon le [HVP], la valeur d'une unité de réserves pétrolières et gazières est égale à son prix courant, diminué des coûts d'extraction. L'on examine dans quelle mesure l'information comptable présentée, nommément les coûts capitalisés et les flux monétaires actualisés, soutient le [HVP].

Le [HVP] peut être utile à toute personne qui évalue les réserves épuisables d'une entreprise, que ce soit dans le but d'établir un prix réglementé ou d'acquérir l'entreprise. Le [HVP] est donc susceptible de servir à un large éventail d'utilisateurs. Si l'information comptable présentée fournit, de fait, un appui important au [HVP], les utilisateurs pourront alors en faire usage de façon efficiente, étant donné le coût relativement faible de l'obtention de données comptables à même les rapports annuels des sociétés.

Les résultats de cette étude sont conformes à la conclusion selon laquelle les coûts d'origine capitalisés ont bien une relation significative avec les valeurs marchandes des sociétés pétrolières et gazières canadiennes. Ils viennent donc appuyer le principe d'évaluation de hotelling et soutenir la conclusion voulant que les données comptables relatives aux réserves soient une variable explicative significative sur le plan statistique de la valeur marchande des réserves d'une société pétrolière et gazière.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Howard D. Teall
Wilfrid Laurier University

Canadian Evidence of the Hotelling Valuation Principle

The purpose of this paper is to provide further evidence of the Hotelling Valuation Principle (HVP) based upon the annual report disclosures of Canadian oil and gas exploration and development corporations. The HVP states that the value of a unit of oil and gas reserves is equal to its current price net of extraction costs. This paper examines the ability of accounting disclosures, namely the capitalized costs and the discounted cash flows, to support the HVP.

The HVP is potentially relevant to any person who is valuing the exhaustible reserves of a entity, whether it be for the purposes of establishing a regulated price or the acquisition of the entity. Thus the HVP has the potential to be useful to a wide range of users. If accounting disclosures do provide significant support for the HVP then users can efficiently employ the HVP due to the relatively low cost of obtaining accounting data from a company's annual report.

The results of this paper are consistent with the conclusion that the historic capitalized costs do exhibit a significant relationship with the market values of Canadian oil and gas companies. Thus this research provides support for the Hotelling Valuation Principle, and provides support for the conclusion that accounting data for the reserves is a statistically significant explanatory variable for the market value of an oil and gas company's reserves.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

George Kanaan
Concordia University
Thomas J. Linsmeier
University of Iowa
Gerald G. Lobo
University of Wisconsin-Madison

Dispersion in Price Indices and the Relative Association Between SFAS 33 Income Measures and Security Returns

Le *Statement of Financial Accounting Standards* n° 33 (SFAS 33) exigeait que les renseignements relatifs aux conséquences de la fluctuation des prix soient livrés dans l'information supplémentaire afférente aux états financiers traditionnels dressés à la valeur d'origine. L'on s'était demandé, dans les études précédentes, si les mesures du bénéfice prévues par le SFAS 33 offraient un contenu marginal d'information, au-delà de l'information livrée par le bénéfice calculé à la valeur d'origine. Le contenu marginal d'information a été associé à une mesure particulière du bénéfice seulement lorsque le coefficient de régression relié à cette mesure du bénéfice affiche une relation constante avec le rendement des titres dans le temps, aussi bien en termes d'indices que de signification statistique. Jusqu'à maintenant, ces travaux de recherche n'ont fourni que des preuves très minces de la signification marginale des mesures du bénéfice proposées dans le SFAS 33.

La présente étude puise à une ligne de pensée différente, fondée sur la théorie économétrique de l'évaluation de l'actif exposée par Sunder (1978). Selon cette théorie, les systèmes de comptabilité à la valeur d'origine, en dollars constants et au coût actuel représentent trois façons différentes de mesurer la même valeur d'échange d'un bien. Le choix de l'une de ces trois méthodes suppose la sélection d'un certain nombre d'indices de prix qui serviraient à ajuster le bénéfice en valeur d'origine pour tenir compte des conséquences des fluctuations de prix sur les activités de l'entreprise. Dans le cadre de cette méthode, le procédé de la valeur d'origine est considéré comme un procédé d'indice « zéro » ,puisque aucun ajustement n'est apporté pour tenir compte de l'inflation dans le calcul du bénéfice de l'entreprise. De façon correspondante, la méthode des dollars constants est un procédé à indice simple, puisqu'elle a recours à un indice économique global dans le calcul du bénéfice de l'entreprise. Et enfin, la méthode du coût actuel est qualifiée de procédé multi-indices, puisqu'elle a recours à plusieurs indices pour ajuster le bénéfice à la valeur d'origine dans le calcul du bénéfice de l'entreprise. Selon les travaux subséquents menés par Lim et Sunder (1987), le bénéfice au coût actuel serait la mesure du bénéfice à privilégier, dans une période donnée, s'il existe d'importants écarts intersectoriels dans les conséquences des fluctuations de prix sur l'entreprise. Par opposition, le bénéfice en dollars constants serait à privilégier si les écarts intersectoriels dans les conséquences des fluctuations de prix sont minimes, étant donné que l'on peut démontrer que cette mesure du bénéfice est moins touchée par les erreurs de mesure que la mesure du bénéfice au coût actuel.

Les prévisions théoriques ont été mises à l'épreuve à l'aide d'un échantillon d'entreprises, pour les années 1980-1982. En 1980, les écarts intersectoriels dans les conséquences des fluctuations de prix n'ont pas été d'une importance significative. L'on s'attendait donc à ce que le bénéfice en dollars constants ait préséance sur le bénéfice au coût actuel en termes de contenu d'information. Par opposition, en 1981 et 1982, l'on s'attendait à ce que le bénéfice au coût actuel ait préséance sur le bénéfice en dollars constants puisque les écarts intersectoriels dans les conséquences des fluctuations de prix avaient une importance significative.

En résumé, les résultats de l'analyse empirique ont en général confirmé les prévisions théoriques.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

George Kanaan
Concordia University
Thomas J. Linsmeier
University of Iowa
Gerald G. Lobo
University of Wisconsin-Madison

Dispersion in Price Indices and the Relative Association Between SFAS 33 Income Measures and Security Returns

Statement of Financial Accounting Standards No.33 (SFAS 33) required that the effects of changing prices be disclosed as supplemental information to the traditional historical cost financial statements. Prior studies examined whether the SFAS 33 income measures provide incremental information content beyond that provided by historical cost income. Incremental information content has been ascribed to an individual income measure only when the regression coefficient for that income measure demonstrates a consistent relationship with security returns over time in terms of both its sign and statistical significance. To date, this research has provided only very limited evidence of incremental significance for SFAS 33 income measures.

This study uses a different line of reasoning based no the econometric theory of asset valuation expounded by Sunder (1978). According to this theory, the historical cost (HC), constant dollar (CD), and current cost (CC) accounting systems are three different means of measuring the same exchange value of an asset. The choice among the three procedures involves the selection of the number of price indices one would use to adjust HC income for the effects of price changes on the activities of the firm. Within this approach, the HC procedure is viewed as a 'zero' index procedure since no inflationary adjustment is employed when calculating the income of the firm. Correspondingly, the CD procedure is a single-index procedure since it employs a economy-wide index to calculate firm income. And finally, the CC procedure is said to be a multi-index procedure since it employs multiple indices to adjust HC income when calculating the income of the firm. Subsequent work by Lim and Sunder (1987) suggests that CC income will be the preferable income measure, in a given period, if there are large interindustry differences in the effects of changing prices on the firm. In contrast, CD income will be preferred if the interindustry difference in price change effects are minimal because that income measure can be shown to suffer less from errors in measurement than does the CC income measure.

The theoretical predictions were tested by using a sample of firms for the years 1980-1982. In 1980, the interindustry differences in the effects of changing prices were not significantly large. Hence, it is expected that CD income prevail over CC income in terms of information content. In contrast, in 1981 and 1982, CC income is expected to prevail over CD income since the interindustry differences in price change effects are significantly large.

In brief, the results of the empirical analysis are generally consistent with the predictions of the theory.

S E S S I O N

IV A

R O O M

1 1 2 3

R E F E R E E D

P A P E R S

1988 CAAA Conference
University of Windsor
Windsor, Ontario

J. Fisher
Wilfrid Laurier University
R. McIntyre
University of Strathclyde

The Impact of Information Technology on the Accounting Profession: Some Preliminary Findings

Bien que l'expression «technologie de l'information» (T.I.) décrive le phénomène créé par la convergence des technologies associées à l'informatique, à la communication et aux systèmes de bureautique, ses conséquences ne se confinent pas essentiellement au travail de bureau. La technologie de l'information a également une incidence sur les activités professionnelles et managériales, et les comptables à titre de «travailleurs intellectuels» n'ont pas plus échappé à l'expansion de la T.I. que les autres secteurs de l'économie.

C'est dans ce contexte qu'une enquête a été entreprise avec l'aide d'une subvention du C.R.S.H.. L'enquête a été effectuée auprès de 1 050 comptables à travers le Canada, provenant en proportion égale des trois principales associations comptables. Elle visait à recueillir de l'information au sujet de certaines des utilisations des systèmes et des applications de la T.I. ainsi qu'à examiner les avenues possibles de leur évolution future.

L'on s'intéresse seulement, dans cet exposé, aux réponses des secteurs de l'expertise comptable et de l'entreprise. Les résultats sont destinés à être en partie prescriptifs dans l'établissement des réponses de la profession, en partie descriptifs en ce qui a trait au scénario actuel et en partie prédictifs dans la mesure où ils portent sur l'évolution future.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

J. Fisher
Wilfrid Laurier University
R. McIntyre
University of Strathclyde

The Impact of Information Technology on the Accounting Profession: Some Preliminary Findings

Although the term "information technology" (I.T.) describes the phenomenon created by the convergence of technologies associated with computing, communication, and office systems, its effects are not confined primarily to clerical work. They also have an impact on professional and managerial activities, and accountants as "knowledge workers" have been no more immune to the spread of I.T. than any other sector of the economy.

It was against this background that we undertook a survey with the assistance of a Seed Grant in Management from the S.S.H.R.C. The survey was directed at 1050 accountants across Canada, drawn equally from the three major accounting bodies. It aimed to document some of the uses of I.T. systems and applications as well as examine possible future developments.

This paper considers only the responses from the Public Accounting and Corporate Sectors. The results are intended to be partly prescriptive in setting out responses from the profession; partly descriptive as regards the current scene; and partly predictive when dealing with future developments.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Paul V. Dunmore
Kelly F. Gheyara
Concordia University

The Impact on Student Performance Of Using Computer Augmented Instructional Strategies in Selected Topics from Accounting Principles

L'idée s'est largement répandue que les méthodes traditionnelles d'enseignement devraient être complétées par des stratégies d'enseignement enrichies par ordinateur (S.E.E.O.), suivant l'hypothèse selon laquelle ce genre de méthodes complémentaires améliorent le rendement des étudiants. On a évalué dans cette étude l'incidence de l'utilisation sélective des S.E.E.O. sur le rendement des étudiants à qui l'on enseigne les principes comptables. Les différences attribuables aux professeurs ont également été vérifiées, par suite d'informations probantes antérieures. La méthodologie utilisée se situe dans le prolongement du modèle linéaire de Dunn et Hall (1984). Les résultats n'ont permis de relever aucune différence entre le rendement des étudiants qui ont été soumis aux S.E.E.O. et ceux qui ne l'ont pas été. Des différences importantes attribuables aux professeurs ont toutefois été observées.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Paul V. Dunmore
Kelly F. Gheyara
Concordia University

The Impact on Student Performance of Using Computer Augmented Instructional Strategies in Selected Topics from Accounting Principles

It has been widely suggested that conventional teaching methods should be supplemented with computer augmented instructional strategies (CAIS) on the premise that such additional methods improve student performance. This study evaluated the effect on student performance in accounting principles by a selective use of CAIS. It also tested for instructor differences pursuant to prior evidence. The methodology used extensions of the Dunn and Hall (1984) linear model. The results did not detect any differences between the performance of those students using CAIS and those not using CAIS. However, significant instructor differences were observed.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

S. C. Beiner
Concordia University

Transfer Pricing for Computer Services

Cet exposé porte sur la question du prix de cession interne appliqué par les services informatiques. La détermination d'un prix de cession s'impose dans le cas où il y a cessions internes de biens ou de services et où il faut évaluer de façon distincte le rendement des entités en cause. L'on développe dans cet exposé les notions et les principes liés au prix de cession tels qu'ils s'appliquent aux services informatiques dans une entreprise. Les considérations pratiques qui interviennent dans la ventilation et la facturation des services offerts par le service informatique aux divers autres services d'un organisme décentralisé sont mises en relief. L'on présente deux modèles visant à déterminer les méthodes appropriées de prix de cession en fonction de l'environnement dans lequel évolue l'organisme. L'auteur soutient que les organismes dont la stratégie du système informatique suppose l'existence d'une base de données utilisent une méthode d'établissement du prix de cession comportant deux étapes, méthode en vertu de laquelle les frais fixes (conception et système de base de données, expansion du matériel, et entretien récurrent et exploitation) sont imputés à titre de coûts de l'exercice à chacun des services; les frais de traitement des données sont facturés aux services tels qu'ils sont engagés; et en ce qui a trait aux coûts des systèmes d'aide à la décision et de support micro-informatique, il est suggéré que le service informatique central soit traité comme un centre de profit. À ce titre, donc, on applique l'idée traditionnelle des deux étapes d'établissement du prix de cession aux services informatiques et à la stratégie du système d'information de base de données.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

S. C. Beiner
Concordia University

Transfer Pricing for Computer Services

This paper addresses the issue of internal transfer pricing for computer services. Transfer pricing becomes necessary when there are internal transfers of goods or services and it is required to appraise the separate performance of the divisions involved. In this paper the concepts and principles of transfer pricing as they apply to the computer services in an organization are developed. The practical considerations involved in the allocation and charging of services offered by the computer department to various departments of a decentralized organization are highlighted. Two models are presented for determining the appropriate methods of transfer pricing depending on the environment in which an organization operates. The researcher argues that organizations with an information systems strategy involving a data base environment utilize a two-step pricing (TSP) method whereby fixed costs (data base design and system, hardware expansion, and recurrent maintenance and operations) are allocated as period costs to the individual departments; routine data processing (DP) costs charged to departments as incurred; and as far as decision support systems (DSS) and micro support costs are concerned, it is suggested the central computer department is treated as a profit centre. As such, then, the paper applies the conventional two-step idea of transfer pricing to computer departments and to the data base information system (IS) strategy.

S E S S I O N

V A

R O O M

1 1 2 1

R E F E R E E D

P A P E R S

1988 CAAA Conference
University of Windsor
Windsor, Ontario

T. Ross Archibald
Darroch A. Robertson
The University of Western Ontario

Financial Accounting Standards and the Indexing of Pensions

Cet exposé a été préparé dans le but de décrire l'incidence sur les états financiers de la législation visant à protéger contre l'inflation les régimes de retraite d'entreprises. Il commence par une rétrospective de la comptabilisation des régimes de retraite au Canada pour étudier ensuite, de façon assez approfondie, la norme comptable récemment révisée s'appliquant au coût des régimes de retraite et aux obligations qui s'y rattachent, que l'on retrouve au chapitre 3460 du *Manuel de l'I.C.C.A.*

Après avoir ainsi dressé la toile de fond, l'on passe à l'analyse de l'incidence de la législation sur les états financiers, dans une optique tant prospective que rétroactive. L'analyse révèle que peu importe la forme que revêt la législation, il y a augmentation des charges liées aux régimes de retraite. Si la législation est rétroactive, l'on assistera également à une augmentation des obligations au titre des régimes de retraite qui sont présentées dans les notes afférentes aux états financiers. Principale conclusion : la profession comptable sera en mesure d'évaluer l'incidence économique de la législation sans difficulté. La réaction du marché des capitaux à ces modifications fait également l'objet d'une brève analyse, qui mène à la conclusion que les marchés s'ajusteront pour tenir compte de l'incidence de la législation.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

T. Ross Archibald
Darroch A. Robertson
The University of Western Ontario

Financial Accounting Standards and the Indexing of Pensions

This paper was written to describe the financial statement impact of legislation designed to provide inflation protection for employment pension plans. The paper begins with an historical overview of pension accounting in Canada and then considers, in some detail, the recently revised accounting standard for pension costs and obligations contained in Section 3460 of the CICA Handbook.

Following this background discussion, the paper investigates the financial statement impact of legislation on both a prospective and retroactive basis. The analysis reveals that no matter what form the legislation takes, there will be an increase in the pension expense. If the legislation is retroactive there will also be an increase in the pension obligation which is disclosed in the notes. The primary conclusion is that the accounting profession will be able to reflect the economic impact of the legislation without difficulty. The capital market reaction to these changes are also briefly considered, with the conclusion that the markets will adjust to reflect the impact of the legislation.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Mort Nelson
Wilfrid Laurier University

Accounting for Investment Gains/Losses by Life Insurance Companies

Cet exposé porte sur l'examen de la méthode selon laquelle les compagnies d'assurance-vie comptabilisent les gains et les pertes d'exploitation dans leur portefeuille de placements à terme et de titres de participation. L'on compare la valeur matérialisée, la valeur marchande et la valeur comptabilisée des gains et des pertes d'exploitation enregistrés entre 1981 et 1986 inclusivement pour un échantillon de quatorze compagnies canadiennes d'assurance-vie, pour en venir à la conclusion que la méthode courante de comptabilisation nivelle de façon excessive le bénéfice présenté et pour proposer une solution de rechange.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Mort Nelson
Wilfrid Laurier University

Accounting for Investment Gains/Losses by Life Insurance Companies

This paper examines the method by which life insurance companies recognize trading gains/losses in their fixed-term and equity portfolio investments. It compares the realized, market value and recognized trading gains/losses for the years 1981 to 1986 inclusive of a sample of fourteen Canadian life insurance companies. The paper suggests that the current method of recognition excessively smooths reported income and proposes an alternative.

S E S S I O N

VI A

R O O M

1 1 2 1

R E F E R E E D

P A P E R S

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Richard Mattessich
University of British Columbia

"Counting, Accounting, and the Input-Output Principle: Recent Archeological Evidence Revising Our View on the Evolution of Early Record Keeping"

Cet exposé offre principalement une interprétation des recherches archéologiques du professeur Schmandt-Besserat du point de vue comptable. Sa principale conclusion est que *ces peuples anciens ont été les premiers à appliquer le principe d'entrée-sortie* (inhérent à tout transfert réel de biens) *à un système de tenue des livres « représentationnel » quasi-numérique* (et plus tard numérique). Il démontre par dessus tout que cette manifestation représentationnelle du principe d'entrée-sortie puise à *une structure logique identique à celle de la comptabilité en partie double* (c'est-à-dire que le transfert d'objets symboliques d'un « endroit » à un autre, à l'intérieur d'une même zone, correspond à une écriture moderne de débit et de crédit). Mais il démontre également que le fait de disposer un objet symbolique dans une enveloppe d'argile après avoir apposé son empreinte sur la surface plus malléable de l'enveloppe, constitue une sorte de double entrée. Non pas simplement parce qu'une écriture réelle et son empreinte inversée ont été effectuées, mais *parce que les fonctions* que remplissent cette « écriture » et son « empreinte inversée » sont essentiellement les mêmes que celles remplies par les écritures de débit et de crédit d'un système comptable moderne.

Un deuxième aspect de cet exposé révèle que tant la comptabilité par symboles du Moyen-Orient ancien que la comptabilité moderne portent sur deux formes distinctes mais reliées de dualité. La première forme de dualité suppose des opérations concrètes et appartient à la *réalité matérielle*, tandis que la seconde forme de dualité tire son origine des relations entre la propriété et la dette qui appartiennent à la *réalité sociale*. L'on démontre dans cet exposé comment ces deux formes de dualité sont reliées et de quelle façon la seconde peut être réduite à la première.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Richard Mattessich
University of British Columbia

"Counting, Accounting, and the Input-Output Principle: Recent Archeological Evidence Revising Our View on the Evolution of Early Record Keeping"

The paper offers mainly an interpretation of Professor Schmandt-Besserat's archeological research from an accountant's point of view. Its major conclusion is that those ancient people were the first to apply the input-output principle (inherent in every actual commodity transfer) to a representational, quasi-numerical (and later numerical) system of record keeping. Above all, it demonstrates that this representational manifestation of the input-output principle reflects the same logical structure as double entry bookkeeping (i.e., the transfer of tokens from one "place" to another, within the same precinct, corresponds to a modern debit and credit entry). But it also shows that the placing of a token into a clay envelope after having impressed it on the softer surface of the clay envelope, constitutes a kind of double entry. Not merely because an actual entry and its negative imprint occurred, but because the functions, which this "entry" and its "negative imprint" fulfill, are basically the same as those accomplished by the debit and credit entries of a modern bookkeeping system.

A second aspect of this paper reveals that both the token-accounting of the ancient Middle East as well as modern accounting deal with two distinct but related duality aspects. The first kind of duality involves concrete transactions and belongs to physical reality while the second kind of duality arises out of ownership and debt relations which belong to social reality. The paper demonstrates how these two types of duality are related and in which way the second type can be reduced to the first type.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Claude Lanfranconi
Darroch A. Robertson
The University of Western Ontario

The Disclosure of Tax Loss Carryforwards and Their Subsequent Realization

Cet exposé, dans lequel sont utilisées des données empiriques provenant de 80 sociétés ouvertes, consiste en un examen de la nature des reports prospectifs de pertes fiscales et de l'étendue de l'information présentée à leur sujet. L'on y évalue si la pratique actuelle, en ce qui a trait à l'information présentée dans les états financiers, est suffisante pour permettre à l'utilisateur de déterminer si les conséquences futures d'un report de perte prospectif toucheront le revenu, l'encaisse ou les deux. L'on se penche également sur la fréquence de la réalisation de reports de perte prospectifs non constatés antérieurement.

Par suite de cette analyse, l'on suggère des modifications aux normes actuelles de comptabilité financière s'appliquant aux impôts sur le revenu, qui font actuellement l'objet d'une révision. Ces recommandations, espère-t-on, contribueront à résoudre les problèmes actuels du manque de clarté et du caractère inadéquat de l'information présentée.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Claude Lanfranconi
Darroch A. Robertson
The University of Western Ontario

The Disclosure of Tax Loss Carryforwards and Their Subsequent Realization

This paper, utilizing empirical data from 80 public companies, examines the nature and extent of disclosure of tax loss carryforwards. It assesses if current disclosure practice, found in the financial statements, is sufficient to permit a user to interpret whether the future impact of a loss carry-forward will be on income, cash or both. The paper also considers the frequency of realization of previously unrecognized loss carryforwards.

As a result of our analysis, we suggest modifications to current financial accounting standards for income taxes, which are under review at this time. We believe our recommendations will help resolve the current lack of clarity and inadequate disclosure.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Andreas Charitou
University of Toronto

Valuation of The Components of Earnings and Cash Flows: A Cross-sectional Investigation

L'évaluation des titres a occupé une place prépondérante dans les écrits pendant de nombreuses années. Bien que la théorie suggère que le cours des actions est relié aux flux monétaires futurs prévus, l'utilité des mesures a posteriori des flux de bénéfices et des flux monétaires comme indicateurs du cours des actions a fait l'objet de controverses. Depuis peu se manifeste un intérêt croissant pour les rapports relatifs aux flux monétaires et un renforcement de la conviction selon laquelle les flux monétaires sont évalués dans le marché. Peu de travaux de recherche ont cependant été consacrés à cette question. L'on a recours dans la présente étude à un modèle intersectoriel d'évaluation des parti ipations pour analyser la relation entre, d'une part, les flux monétaires d'exploitation, les impôts reportés, les produits à recevoir et les charges à payer et, d'autre part, le cours des actions. L'étude a été menée auprès d'un échantillon de 403 entreprises des États-Unis pour la période de dix ans s'échelonnant de 1976 à 1985. Les principaux résultats sont les suivants: 1) il existe un lien entre les flux monétaires d'exploitation et le cours des actions, b) les impôts reportés et les produits à recevoir et les charges à payer expliquent les écarts entre les entreprises au chapitre de la valeur marchande des actions ordinaires, étant donné les flux monétaires d'exploitation, et c) il existe un lien plus fort entre les flux monétaires d'exploitation et le cours des actions qu'entre les impôts reportés ou les produits à recevoir et les charges à payer et le cours des actions. Ces résultats pourraient également susciter l'intérêt des responsables de l'établissement des normes et des sociétés au Canada, en raison des similarités observées entre le Canada et les États-Unis au chapitre de l'établissement des normes, de l'information financière et du fonctionnement des marchés de capitaux.

1988 CAAA Conference
University of Windsor
Windsor, Ontario

Andreas Charitou
University of Toronto

Valuation of The Components of Earnings and Cash Flows: A Cross-sectional Investigation

Security valuation has been prominent in the literature for many years. Although theory suggests that stock prices are related to future expected cash flows, there has been controversy about the usefulness of the ex post accrual and cash flow measures in signaling stock prices. Recently, there has been an increasing interest in cash flow reporting and a strengthening belief that cash flows are valued in the marketplace. However, not much research has been devoted to that issue. This study employs a cross-sectional equity valuation model to examine the association of operating cash flows, deferred taxes and accruals with security prices. A sample of 403 US firms is used for the ten-year period of 1976-1985. The principal findings are as follows: a) there exists an association between operating cash flows and stock prices, b) deferred taxes and accruals explain differences across firms in the market value of common equity, given operating cash flows, and c) there exists a stronger association between operating cash flows and stock prices than between deferred taxes or accruals with stock prices. These results may also be of interest to standard setters and companies in Canada, due to the similarities between Canada and US in standard setting, financial reporting and the functioning of capital markets.

ACCOUNTING EDUCATION AND SCHOLARSHIP IN DEVELOPING COUNTRIES: WHAT ARE OUR RESPONSIBILITIES?

Gerhard G. Mueller, University of Washington

During the 1960s and 1970s there was a great deal of highly emotional rhetoric about the various issues assisting and afflicting economic development. While the problems are as severe as ever, today's debate about them is less shrill. More of the industrialized countries participate in continuing economic assistance to the developing countries. Also several industrialized nations turned out to be more vulnerable economically than was thought earlier. It is difficult to find much support for a substantial North-South wealth redistribution scheme when there is major poverty, homelessness among some citizen groups, and both unemployment and underemployment at home! As the 1980s draw to a close, it appears that a growing number of leaders in the Third World recognize that effective self-help is probably the golden rule of development.

Of particular note, are changes in attitude both toward and from multinational corporations (MNCs). In a survey study conducted on behalf of the Committee for Economic Development (CED) and published in 1980, Isaiah Frank reports (p. 145),

> It is apparent from the interviews that an important evolution has taken place in the attitudes of transnationals toward the growth process in the developing countries and toward their relationship to that process. To a much greater extent than in the fifties and sixties, the corporations recognize both the diversity of circumstances in the Third World and their own need for flexibility in their approach to individual countries. There is also less of a tendency to regard the historical process of transformation now taking place in much of the Third World as a replica of the industrialization process that occurred in the now-developed countries during the eighteenth and nineteenth centuries. As latecomers to development, the nations of the Third World are in a profoundly different position, and many are confronted with problems of poverty and population pressure on a scale that exceeds anything experienced by the Western world during the period of its industrialization.

Another leading authority on developing nations, Professor Albert O. Hirschman, who served on the faculties of Yale, Columbia and Harvard, and is presently affiliated with the Institute for Advanced Study at Princeton, writes about the "significant turnabout" which some developing countries have recently

experienced. He headlined a recent article "Business Should Bet on the Third World". (Business Month, July 1987, pp. 25-26).

Without belaboring the point some winds of change are blowing across the Third World. Hence it is a good time to revisit the academic accounting dimensions involved.

Synopsis of Prior Work

Samuels and Piper (1985) provide one of the more cogent reviews of the "accounting and economic development" subject matter. They discern that the existing literature divides itself into two categories: (1) What type of accounting systems are needed in developing countries, and (2) what education and other means should be employed in developing countries to increase their pools of trained accountants? This two-way classification is employed in the present paper as well. Three separate elements of each of the two questions are identified and briefly reviewed.

1.1 Benefits to be Delivered by an Accounting System. In the quest to identify appropriate accounting systems for developing countries, early writers approached the topic from the perspective of an accounting system's utility to the developing economy. One pioneer author (Scott, 1970) posited an "economic evaluation accounting" framework. Enterprise accounting in a developing nation, he argued, should be carefully structured to provide adequate information to facilitate the economic evaluation of companies' activities by management, investors and government.

Enthoven (1965, 1967, 1969, 1970), another pioneer writer in this field, also stresses the utility aspect of accounting by arguing that accounting systems appropriate to developing countries must not only be responsive to business enterprise needs, but also to the needs of governmental activities and national planning activities. To him, Third World accounting systems must necessarily fuse financial accounting, managerial accounting, governmental accounting, national income accounting, and auditing of all types. Various cases of accounting system inadequacy were discussed at the 1976 Society for International Development (SID) seminar, entitled "Accounting in Economic Growth and Development," held at the University of North Carolina at Chapel Hill. Indirectly related to accounting but still of considerable interest is the same Society's Prospectus 1984--a series of papers presented at Duke University in honor of SID's twenty-fifth anniversary.

1.2 Environmental Variables as Determinants of Accounting Systems. No analytical or rigorous empirical studies are available on the topic of linking environmental factors and accounting systems. However, the topic has received considerable attention in a priori fashion. Choi and Mueller (An Introduction to Multinational Accounting, 1978) list "a number of the environmental circumstances that apparently affect accounting development directly."

1. Type of economy involved
2. Legal system
3. Political system
4. Nature of business ownership
5. Differences in size and complexity of business firms
6. Social climate
7. Relative stability of the currency of account
8. Level of sophistication of business management and the financial community.
9. Degree of legislative business interference
10. Presence of specific accounting legislation
11. Speed of business innovations
12. Stage of economic development
13. Growth pattern of an economy
14. Status of professional education and organization
15. General levels of education and facilitating processes

Reporting at approximately the same time, an American Accounting Association Committee on International Accounting came up with a morphology for comparative accounting systems. They produced eight parameters of differentiation, namely:

1. Political system
2. Economic system
3. Stages of economic development
4. Objectives of financial reporting
5. Source of or authority for standards
6. Education, training and licensing
7. Enforcement of ethics and standards
8. Client

Nobes, in a more recent effort(reprinted in Choi and Mueller, Frontiers of International Accounting, 1985) explains his endeavor as follows:

> An attempt has been made to isolate those features of a country's accounting which may constitute long-run fundamental differences between countries. The exercise was made possible by having reduced the scope to 14 countries with public companies. A programme of visits, interviews and reading relating to these countries was carried out. The result was a selection of nine factors which, unlike the factors of most of the researchers above, are overt and thus available for inspection, criticism and amendment.

Nobes' factor list is as follows:

1. Type of users of the published accounts of the listed companies
2. Degree to which law or standards prescribe in detail, and exclude judgment
3. Importance of tax rules in measurement
4. Conservatism/prudence (e.g. valuation of buildings, stocks, debtors)
5. Strictness of application of historic cost (in the historic cost accounts)
6. Susceptibility to replacement cost adjustments in main or supplementary accounts.
7. Consolidation
8. Ability to be generous with provisions (as opposed to reserves) and to smooth income
9. Uniformity between companies in application of rules

Since Nobes deals only with industrialized countries, his differentiating factors exclude economic development variables.

In another recent effort, Amenkhienan (1986) employs multidimensional scaling methodology to identify "environmental characteristics" of given accounting systems. His hypothesis is (p. 49) "that international accounting systems can be determined on the basis of their underlying environmental characteristics." The following environmental variables are included in Amenkhienan's work:

1. Official Language(s)
2. Political System
3. Legal System
4. Type of Economy
5. Savings as a percentage of gross capital formation
6. Gross capital formation as a percentage of GNP
7. Income per capita
8. Balance of trade (percentage)

9. Private consumption expenditure as a percentage of GNP
10. Agricultural output as a percentage of GNP
11. Change in foreign exchange rate
12. Change in consumer price index

The accounting principles and reporting practices on which system similarities/dissimilarities are based include the following:

1. Historical Cost Convention
2. Going Concern Concept
3. Consistency Concept
4. Accrual Concept
5. Realization Concept
6. Matching Concept
7. Fair Presentation
8. Materiality
9. Disclosure of Departures from Historical Cost
10. Disclosure of Departures from Going Concern
11. Disclosure of Departures from Consistency
12. Disclosure of Departures from Accrual
13. Disclosure of Departures from Realization
14. Disclosure of Departures from Matching
15. Accounting Policies
16. Balance Sheet Items
17. Income Statement
18. Statement of Changes in Financial Position
19. Consolidation and Business Combinations
20. Foreign Currencies
21. Diverse Activities

Amenkhienan then proposes the following "model" for accounting standard-setting in a given developing nation:

1. Collect data on important environmental variables (official language, legal systems, etc.).
2. Analyze data collected in (1) above comparatively with similar data on the developed nations, using some multivariate classification technique(s).
3. On the basis of the environmental analysis determine with which group of developed nations the given developing nation clusters.

4. For the cluster determined in (3) above analyze the accounting principles and reporting practices to determine 'commonalities.'
5. Develop own accounting and reporting standards within the general framework of the commonalities resulting from step 4.

Many other attempts have been made to associate environmental factors and accounting characteristics. One study used "welfare of the common man" as the salient variable.

1.3 Technology Transfer Dilemma. The third school of thought on accounting development basically defines the problem as one of accounting technology transfer. Oversimplified, the transfer advocates sought to compile a giant world-wide classified inventory of all accounting standards and practices and then transfer appropriate bits and pieces to a given developing country as prescribed or somehow voluntarily selected. In practice, however, the transfer mechanism is much like yesterday's colonialism--major elements of the Dutch accounting system were transferred to Indonesia, the French system to former French colonies in Africa and the South Pacific, the British System to most Commonwealth member countries, etc.

Increasingly, accounting academics are taking issue with such "colonial" type transfers. Nobes (1987) takes the International Federation of Accountants (IFAC) to task for pushing its international accounting standards and its international auditing guidelines (both "a slightly permissive amalgam of US and UK standards") upon developing countries. Specifically:

> In developing countries it is ludicrous to gear the whole country to judgmental 'fair' accounting with its emphasis on financial reporting and external auditing. If there are few shareholders and few accountants, Anglo-American accounting leads to an appalling waste of resources.....
>
> In conclusion, it may appear to serve the purposes of the Anglo-American profession to push our commercial accounting further into non-commercial and non-Anglo-American areas. But there must be severe doubts about whether this leads to meaningful information or effective use of resources. IFAC, IASC and other harmonizers should think through the purposes, relevance and effects of their activities.

Hove, Chairman, Department of Accounting, University of Zimbabwe, makes the point even more forcefully (1986). He "recommends that the accounting objectives of each developing nation, not those of all developing nations, should be determined. In addition, these objectives should not be determined by

the International Accounting Standards Committee, the American Accounting Association, or the United Nations, for example; they should be determined by the natives of those developing countries on the basis of the legal, economic, and social conditions there in accordance with the understanding within each country of the basic economic facts underlying business transactions."

Hove concludes "Those who advocate the standardization of accounting practice internationally will not solve the problem; only the nationals of the LDCs themselves can and should find ways to correct the situation. Developed countries can, however, assist in providing consultancy services and financial assistance for whatever accounting research projects must be conducted as part of the process of adapting existing accounting practice to suit the needs of developing countries."

Belkaoui (1974), Briston (1978), Puxty, Oliga and Chua (1981), as well as Qureshi (1975), have all written in the same vein. Accounting standards and practices simply transferred from the developed countries in unmodified form are inappropriate in developing country situations.

2.1 Education and Training Development. Shifting now to the second part of the Samuels and Piper categorization, we recognize a rather substantial literature that is primarily individual country descriptive or judgmentally prescriptive. Individual country descriptions of local accounting training and education systems are available for a great many developing countries. They are often written by visitors from industrialized countries and therefore "filtered." These descriptions are a significant information source.

Expert opinion has suggested a full range of approaches from free-standing accounting training centers in the Third World to the creation of an "International Association for Accounting Development." Special case studies have been suggested as well as direct economic assistance earmarked for accounting training. Special-purpose textbooks have appeared on lists of recommendations as have the training courses offered by private professional societies like the Institute of Chartered Accountants in England and Wales and the Association of Certified Accountants.

Again, the appropriateness of a particular approach to training and education for a given country is the big question throughout all of this literature. Your author, in an address to the Sixth International Conference on Accounting Education in Kyoto (1987) identified four distinctly separate approaches to academic accounting worldwide.

1. Professional technology approach (France and Mediterranean countries)
2. Independent professional approach (mostly members of The Commonwealth--Association of Independent Nations)
3. Subdiscipline approach (Germany, Holland, Scandinavian countries, USSR)
4. Full discipline approach (USA)

So long as there exist major variations worldwide in the approach to the academics of accounting, it seems impossible to derive a unique prescription for a developing country. If one follows the thoughts of Hove and like-minded scholars, specifically developed indigenous education and training systems are the only hope for development success.

2.2 Global Standardization with Adaptation to Local Circumstances. This is essentially the philosophy behind the work of the IFAC and the ISAC. Earlier quotes in this paper have established that experts like Nobes and Hove are critical of this pattern. The same argument can be made with respect to education and training. It is questionable, at best, that even the most effective accounting textbook from Canada or the United States can be adapted to serve well in Afghanistan, Indonesia or Zambia. Recent literature suggests that broad standards or baselines may be useful on a regional basis (e.g., the European Economic Community) or for defined groups of industrialized countries (e.g., the OECD nations). But to include the entire Third World within the scope of global standards and norms is overambitious.

2.3 Cooperative Networking. This is the theme which experts like Enthoven have sounded throughout a great many articles and books. It is also the theme of much association activity. For example: In its monograph entitled Accounting Education and the Third World, the 1976-1978 American Accounting Association Committee on International Accounting Operations and Education made "regional and international coordination and cooperation" one of its three overall conclusions. World Bank and IMF efforts have pointed in the same direction as have the various regional development banks. It is clearly a part of faculty and student exchanges, cooperative agreements between universities, and governmental programs like the West German Marshall scholars or the US Fulbright scholars.

Much of the literature in this track can be described as idealistic, judgmental and often emotional. Your author has not encountered any analytical models or hard data here. The claims made for individual proposals seem to have no limits. It is surprising that university scholars let themselves be drawn into syndromes of impossible expectations.

Brief Descriptions of Third World Accounting Systems.

The foregoing synopsis warrants three generalizations: First, the literature on accounting in developing countries is "all over"--fractionated, varied in quality, and inconclusive. Second, only a limited amount of serious scholarly research has been applied to the field of accounting in relation to the Third World. Third, probably in part due to the preceding two points, accounting in developing countries is recognized as one of the more important accounting problems of our day.

As a way to stimulate some interest in the topic at hand and working from a scholarly perspective at the lowest level of abstraction, namely pure observation, your author grouped the accounting activities in developing countries into eight patterns or "systems." Whether anywhere from three to fifteen such groupings can be uniquely defined is of little importance. But if any definition clearly differentiates between accounting in industrialized versus developing countries, initial scope for analysis is established. Research might then seek to analyze the effects, positive and negative, from the transfer of accounting technology between two systems that have been defined as "different".

Here are some possible groupings:

A. Anglophone

Countries in this group have British colonist roots. They include Hong Kong and Singapore, India and Pakistan and extend to Africa as far as Nigeria and Ghana, as well as Kenya and Zambia. In this group institutes or societies of qualified accountants generate and enforce their own "qualifications." Universities are only partly responsible for higher education in accounting while professional bodies supply technical tuitions, set and administer examinations, and finally admit professional aspirants to membership. Through political accommodation, governments recognize the privately developed "qualifications" of professional accountants. Where local professional bodies do not yet exist or are in early developmental stages, professional qualifications from other countries within the Anglophone system are accepted.

Membership in a U.K. institute of chartered accountants is accorded superior recognition. A schism typically exists between academic and practicing professional accountants. A "common law" approach to accounting standards is utilized, i.e. different companies (like different cases) require different accounting and reporting solutions. There is widespread acceptance of the "true and fair" concept of financial reporting.

B. ASEAN (Association of Southeast Asian Nations)

The five countries in this group are Indonesia, Malaysia, The Philippines, Singapore and Thailand (note the overlap for Singapore with the Anglophone group). The ASEAN countries formed their own Federation of Accountants, mainly to foster indigenous accounting development. Among the major objectives of the Federation are (1) to establish an ASEAN philosophy for the accounting profession and (2) to establish a medium for closer relations, regional cooperation and assistance among ASEAN accountants. Aside from former colonial influences, ASEAN is using IASC standards as points of departure for their own work. Accounting is a popular field in these countries. More local citizens receive professional qualifications from local institutes than the local economies can absorb. There appears to be broad recognition that accounting is a key factor in economic development.

C. ASIAN (Pacific Rim) Countries

The leading nations in this group appear to be the Republic of Korea and Taiwan. Both of these countries have achieved economic development breakthroughs in the last two decades. They appear to be well on their respective ways toward industrialization. In financial accounting terms this group appears to be patterning itself after the U.S model--much like the Anglophone group is influenced by the U.K. model. Naturally there are strong local cultural and sociopolitical factors which mark and constrain this system but its overall development direction appears to have been set. Eventually an "Asian-American" system might evolve just like a "British-American" system exists today.

D. Chinese

The PRC's history, cultural strength and absolute size make it unlikely that she will ever be dominated from the outside. Accounting is no exception. One of former Chairman Mao's dicta was that accounting must be made simple enough so that every citizen can fully understand it. This turned out to be a "mission impossible." Extant accounting procedures and systems in the PRC are

simplistic and procedural. But with the new world view of the PRC's leadership has also come a large thrust to modernize accounting. Many Chinese graduate students are presently studying accounting in the industrialized countries. Professional firms from the West are conducting seminars and training schools within the PRC. What will emerge from this is still unclear. While it is likely to be a system whose procedures and outputs are understandable and usable in world commerce and international financial markets, chances are that it will be a system unique to its native country.

E. Francophone

Most former French/Belgian colonies fall into this group--mainly in Polynesia and throughout Africa. All follow the long-standing French tradition of centering all accounting thinking around a giant national chart of accounts. The chart is essentially a classification device which serves not only private enterprise but also tax and national income accounting.

In this type of system accounting is not perceived as a university discipline. At the university students study in the liberal arts and humanities and upon graduation gain accounting knowledge through courses at technical institutes. National accounting councils are typically more influential than professional commissions or boards. The control potential of a "national chart" system is significant. Fair financial reporting to financial market participants is peripheral here. The Francophone developing countries are now the strongest adherents to this traditional system since French accounting itself is increasingly adapting to European Common Market requirements and developments.

F. Mediterranean

For accounting purposes this group of countries comprises the northern Mediterranean from Spain and Italy to Malta, Greece, Turkey and Lebanon. These countries share rich histories in our field but are suffering currently from an acute state of underdevelopment. They spend little or no resources on accounting research, give almost no university attention to the subject matter, and their practicing professions have only limited national and social presence. Cost and sometimes language constraints limit their participation in international committees and conferences. Governmental bureaucracies heavily influence the modest scope of accounting practices and the limited dimensions of the organization of the field. There are not enough independent characteristics

for this "accounting sphere" to describe it as a system. It has few salient features.

G. Middle Eastern

Under the leadership of Egypt and the Gulf states, a new world accounting pattern is breaking which is oil economy dependent and oriented toward making outward investments. Most notable about this pattern or system however, is its overt linkage to Islamic religion. At present relatively little occurs in the Middle Eastern region that is independent of Islamic religious considerations. Accounting is no exception.

While the evolving Middle Eastern accounting system draws heavily on existing British-American (Anglo) patterns, it contains a number of unique features. An example is the treatment of interest. Since Islamic religious tenets prohibit charging or accepting interest, the time value of money must receive entirely different accounting recognition.

In Zaria (northern Nigeria) your author became aware of a local university conference on "Islamic economics." There is every reason to believe that in due course something labeled "Islamic accounting" will be identified and propagated.

H. South America

Over the last three decades South American countries have experienced the most persistent inflationary pressures worldwide. This has marked their financial accounting standards and practices to the extent that the recognition of inflation effects has become routine. Moreover, this recognition is based on general purchasing power adjustments throughout South America. Somehow the current cost or current market value measurement alternatives (so widely discussed in the industrialized countries) never got very far in the southern regions of the Western Hemisphere. Thus a unique financial accounting and reporting system has established itself throughout South America. It is interesting that all the countries in this region have opted for the same accounting pattern. The pattern has clearly transcended political boundaries and ideologies.

State-of-the-Art Assessment

Review of the existing literature on our topic and the variety of accounting systems now existing in developing countries turns out to be a humbling experience. While a few writers have created a strong presence for themselves in this literature (e.g., Professors Briston, Enthoven and Scott)

there is little beyond description and expert opinion. In other words, rigorous academic research methods have not been applied to this topic.

By making some judgements of our own the following picture emerges.

3.1 Use of the "Stew-Pot" Approach. Nearly all of the literature treats accounting in relation to the Third World in a single dimension--as though all the individual countries of the Third World were somehow highly similar. Cross-national cultural research (Hofstede, 1984) forcefully laid to rest the notion that cross-cultural differences in management (including accounting) are trivial. Cultural differences are just as prevalent in the Third World as they are in the Second and First Worlds. To make prescriptions and policy suggestions assuming homogeneity among all developing countries is untenable. Accounting issues in the Third World have to be dealt with on a country-by-country basis.

3.2 The Factor/Modeling Paradigm. In Section 1.2 of this paper we took a somewhat detailed look at the literature seeking to model national accounting systems on various measurements of environmental factors or variables. There are at least three problems here. The first is that while most accountants agree that some relationship between the environment and the national accounting system exists, this relationship has not been reliably specified and/or tested. Second, even if clear linkages could be evolved under this paradigm there are no decision rules by which a national accounting system could be judged optimal or at least satisfying. Third, again relying on earlier discussion in this paper, it appears improbable that the variables influencing accounting development in industrialized countries are the same as those likely to be significant in developing countries. The recognized technology transfer dilemma comes to bear.

3.3 Accounting Education Research Worldwide. Following the line of thought laid out immediately above, education and research systems are subject to the same technology transfer syndrome. On the one hand we noted in Section 2.1 of this paper that there are distinctly separate approaches to academic accounting now in use around the world. Which of these might be appropriate for the rather amorphous Third World? On the other hand the existing literature clearly recognizes that textbooks, teaching styles, pedagogic methods and research endeavors effective in industrialized countries are broadly inappropriate for

developing countries. This casts a shadow over some international academic exchanges now taking place.

3.4 Existence of a British-American Bias in World-Wide Financial Accounting Developments. We have already quoted Nobes (1987) to the effect that "Anglo-American" financial accounting may not be appropriate for non-Anglo-American areas. Yet financial accounting and reporting in the British-American style is making major inroads in Europe (via the EEC directives) and in Asia (e.g., Japan, Singapore, South Korea and Taiwan.) Also there is little question that the international accounting agencies (e.g., IASC and IFAC) work from a British-American base line. The IASC's recent "Framework for the Preparation and Presentation of Financial Statements" is yet another case in point. While the growth of the British-American financial accounting "model" may be beneficial from a world-wide harmonization point of view, its usefulness in developing countries situations is an open question. Expert opinion as sampled in Section 1.3 above rejects such usefulness.

3.5 Unadjusted Transfer of Professional Paraphernalia. Along with the four immediately preceding points we also reject the unconditional export of professional accounting paraphernalia from the industrialized to the developing countries. In this category we include organizational structures of professional accountancy bodies, professional regulation, codes of conduct, professional examination procedures, conditions for professional qualification, continuing education requirements and the like. These are all heavily culture-bound and thus likely to suffer decreasing utility upon straight transfer. The problem becomes especially acute when a given domestic training and examination system, geared to produce a domestic professional qualification, is administered in developing countries to enhance the local supply of qualified accountants. These people are "qualifying" on someone else's terms and conditions! We earlier called this a form of accounting colonialism.

3.6 Decoupling From Outside Experts. The economic development literature is replete with recommendations, proposals, strategic goals, and even outright threats from a plethora of outside experts. Most of these experts seem to have political backgrounds and employment with international political agencies. Many of their panacea are couched in economic terms--again often simply transposing assumptions and relationships from industrial countries to

developing countries. Highly visible fora for outside expert groups are institutions like the World Bank or working groups like the Brand Commission.

Your author's view is that the high imperatives typically emanating from outside expert groups are not particularly helpful to accounting development. Better results seem to have come about where accountants have helped other accountants or would-be accountants. Thus a self-help principle is preferred.

3.7 Local Government Involvement. Some available evidence suggests that Third World accounting development will not go very far without active involvement and support from local governments. This may well be a self-evident proposition, but it apparently has not been followed widely. Local governments, of course, have huge demands on what are typically very scarce resources. Accounting development is typically not one of their well-established priorities, thus finding ways of convincing local government officials of the contributions accounting can make to development is most critical. In the author's opinion, for example, the UN would have achieved far better results had it conducted workshops on the usefulness of accounting in Third World countries for their finance and economics ministers than it did by establishing working groups to propose accounting and reporting standards for MNCs. The available evidence leaves little doubt that accounting development will not get far without top level local government understanding and encouragement--if not some form of direct assistance.

What Are Our Responsibilities?

First and foremost, as academic/professional accountants in the First and Second Worlds, we have to bring ourselves to recognize a substantive responsibility toward accounting development in the Third World. This is not a scientific argument. Some will consider it a matter of morality and ethics. Others see it as a matter of equity and fairness among the humans populating the planet. Still others would use economic arguments such as adequate standards of living for all. Interdependence--the global village idea--may motivate yet another group of accountants. Without express recognition of a clear responsibility we are likely to remain at the status quo.

Turning now specifically to accounting academics, we have to opt out of the current opinion expression mode into a serious research and writing mode. Three avenues appear promising. First is education research in specific country environments. In developing countries qualified accountants must be produced

from non-traditional accounting environments. This involves researchable problems from attracting students to higher education, attracting them to accounting, helping them to master accounting subjects and finally, having them succeed on professional examinations. One prototype study was presented at the Sixth International Conference on Accounting Education (Kyoto, 1987). The authors are M.C. Mehl and S.H. Weil of the University of the Western Cape, Bellville, South Africa. The working paper is entitled, "Accounting Education in a Disadvantaged Socio-Economic Environment: A South African Case Study."

Specific country case studies are a second likely vehicle for effective scholarship in this area. In Section 1.3 above we mentioned the study by Hove (1986) concerning Zimbabwe. Tang and Tse (1986) entitled their study, "Accounting Technology Transfer to Less Developed Countries and the Singapore Experience." While some earlier specific country case studies are less analytical they still serve important descriptive purposes. Once enough comprehensive case studies are on hand, comparative work will emerge which in turn should facilitate analytical efforts.

Still within the realm of academic thrust there exists a real need for useable databases on accountants and accounting in developing countries. Today's world of accounting research is dominated by empirical data. Data availability is often instrumental in creating and guiding new research. There is every reason to believe that similar effects would occur if readily useable data were available on developing countries.

The third suggestion takes its cue from the recent political thaw between the two super powers. The new motto seems to be fairly simply "increase traffic." Why not do the same in accounting between industrialized and developing countries? Joint textbook writing efforts come to mind as do reciprocal participation in economic seminars, conferences and colloquia. Academic professional organizations might be created in the Third World and affiliations created with corresponding associations in the industrialized world (the Affiliate Organizations Program of the American Accounting Association is a start in this direction). Unstructured exchanges between students and faculty are further avenues of increased traffic. Eventually even professional institutes might develop "sister" or "brother" relationships with counterpart institutes elsewhere. The general lack of funds has kept present traffic volumes to a minimum. It would not take much to double or triple present accounting traffic between the developing and the industrialized countries.

BIBLIOGRAPHY

Felix E. Amenkhienan, Accounting in Developing Countries: A Framework for Standard Setting. Ann Arbor, MI: UMI Research Press, 1986, 101 pp.

American Accounting Association, Accounting Education and the Third World (Report of the Committee on International Accounting Operations and Education, 1976-1978). Sarasota, FL: Author, 1978, 109 pp.

L.A. Bace, E.H. Schwallie and G.W. Silverman, Coping With Inflation--Experiences of Financial Executives in the U.K., West Germany and Brazil. New York, NY: Research Foundation of Financial Executives Institute, 1981, 103 pp.

Richard J. Briston, "The Evolution of Accounting in Developing Countries", International Journal of Accounting, Fall 1978, pp. 105-120.

Adolf J. H. Enthoven, "U.S. Accounting and the Third World", Journal of Accountancy, June, 1983, pp. 110-112, 115, 116, 118.

_____, Accounting Education in Economic Development Management. Amsterdam, NL: North-Holland Publishing Co., 1981, 448 pp.

_____, Accountancy and Economic Development Policy. Amsterdam, NL: North-Holland Publishing Co., 1973, 380 pp.

Isaiah Frank, Foreign Enterprise in Developing Countries. Baltimore, MD: Johns Hopkins University Press, 1980, 199 pp. (A Supplementary Paper of the Committee for Economic Development.)

J. B. Ghartey, "Accountability, the Threshold of Political Instability, Underdevelopment, and Misery: The Case of Africa", International Journal of Accounting, Fall 1985, pp. 143-158.

H. Peter Holzer (Editor), International Accounting. New York, NY: Harper & Row, 1984, 524 pp. (Chapter 19, "Accounting in the Third World").

Mfandaidza R. Hove, "Accounting Practices in Developing Countries: Colonialism's Legacy of Inappropriate Technologies", International Journal of Accounting, Fall 1986, p. 81-100.

B. L. Jaggi, "Accounting Studies of Developing Countries: An Assessment", International Journal of Accounting, Fall 1973, pp. 159-170.

Gardner Jones, "Birth of an Accounting Profession--the Ethiopian Experience", International Journal of Accounting, Fall 1971, pp. 89-98.

Roger Juchau, "Accounting Practice Problems in Papua, New Guinea and Fiji", Australian Accountant, March 1978, pp. 110-113.

Marc Levinson, "Business Should Bet on the Third World", Business Month, July, 1987, pp. 25-26.

William Markell, "Development of Accounting Education and the Accounting Profession in Third World Countries: Botswana", International Journal of Accounting, Fall 1985, pp. 99-105.

Ann Mattis, (Editor), A Society for International Development: Prospectus 1984. Durham, NC: Duke University Press, 1983, 248 pp. (Papers of the Twenty-Fifth Anniversary World Conference of the Society for International Development.)

Robin McPhail, "Developing Countries--What Role for the International Accounting Profession?", Accountant's Magazine, July, 1982, pp. 242-245.

M. C. Mehl and S. H. Weil, "Accounting Education in a Disadvantaged Socio-Economic Environment: A South African Case Study", Sixth International Conference on Accounting Education, Kyoto, 1987, (unpublished).

Gerhard G. Mueller, "Emergence of Accounting as a World Discipline", Sixth International Conference on Accounting Education, Kyoto, 1987, (unpublished).

Belverd E. Needles, Jr., "Implementing a Framework for International Transfer of Accounting Technology", International Journal of Accounting, Fall 1976, pp. 45-63.

Christopher Nobes, "Is Anglo-American Accounting Right for Developing Countries?", International Accounting Bulletin, May 1987, p. 13.

C.W. Nobes and R.H. Parker, Comparative International Accounting, 2nd Ed. Deddington, UK: Philip Alan Publishers, Ltd., 1985, 383 pp. (Chapter 9, "Accounting in Developing Countries".)

J. M. Samuels and J. C. Oliga, "Accounting Standards in Developing Countries", International Journal of Accounting, Fall 1982, pp. 68-88.

J.M. Samuels and A.G. Piper, International Accounting: A Survey. New York, NY: St. Martin's Press, 1985, 197 pp. (Chapter 6, "Accounting and Economic Development".)

George M. Scott, Accounting and Developing Nations. Seattle, WA: Graduate School of Business Administration, University of Washington, 1970, 168 pp.

Shanghai University of Finance and Economics & The University of Texas at Dallas (Professors A.J.H. Enthoven and Lou Er-Ying, Eds.), Accounting and Auditing in the People's Republic of China. Richardson, TX: Author, 1987, 226 pp.

Society for International Development, The Role of Accounting in Economic Development. Washington, D.C.: Author 1976, 103 pp. (mimeographed).

Roger Y. W. Tang and Esther Tse, "Accounting Technology Transfer to Less Developed Countries and the Singapore Experience", Columbia Journal of World Business, Summer 1986.

University of Washington, Graduate School of Business Administration, International Accounting Seminar. Unpublished papers by James Boyd, Lillian W. McKay, Brian Stevens, Kim-Hock Teh, and Cristian Wulf.

Vernon K. Zimmerman (Editor), Recent Accounting and Economic Developments in the Far East. Urbana, IL: University of Illinois, Center for International Education and Research in Accounting, 1988, 234 pp.

Note. These comments are prepared for the Canadian Academic Accounting Association 1988 convention in Windsor, June 1,2. They are discussion comments arising from and directed to the plenary paper "Accounting Education and Scholarship in Developing Countries: What Are Our Responsibilities?" by Gerhard G. Mueller.

ASSISTING DEVELOPING COUNTRIES WITH ACCOUNTING.

Daniel McDonald, Simon Fraser University

INTRODUCTION

Thank you very much Professor Mueller. As a discussant I always feel caught between commenting on the aspects the speaker chose to cover (which seems repetitive) or on the aspects the speaker chose not to cover (which seems presumptuous). If I err, it is in dealing somewhat more with the foreign aid aspects of the topic.

DOMESTIC AND OVERSEAS RESPONSIBILITIES

One cannot avoid the interaction between overseas and domestic responsibilities.

Proposition 1: It is unlikely that overseas responsibilities can be well served if domestic ones remain unmet.

Thus we all participate in meeting overseas responsibilities even if we appear to be concerned only with domestic matters. As accounting education and scholarship are improved domestically we are first improving on the substance of what is potentially available to developing countries <u>if they want it</u>. At the same time we increase our capacity to provide it <u>if we want to</u>.

So our first role is that of a role model and in this we must do the best job domestically that we can. To the extent that this is done by all "developed" countries the developing countries will have a range of models to choose from and the choice is likely to be more appropriate if all the "display models" are good quality representations of what is available. If mechanisms exist for the developing countries to "mix and match" selecting models, methods, and institutions which fit their requirement then the "technology transfer dilemma" which Prof. Mueller describes may be minimized.

Another aspect of domestic responsibilities relates to the role of accounting in monitoring the use of foreign aid in general. If foreign aid in other fields, e.g. agricultural

development, require monitoring to ensure the aid contributes directly to goal accomplishment, then accounting is needed. Either the aid supplier will have to supply the accounting services as well, or have assurance that the recipient country has in place an accounting infrastructure that provides the level of information and control which is required.

FOREIGN AID AS AN EXPORT

Whether it be in goods, services, or outright money grants foreign assistance is best viewed as an export. And if there is an export then the other party view of it is as an import. Even gifts are a transaction and there must be a willing recipient as well as a willing donor and the deal must be acceptable to both. However foreign aid usually involves a mixture of "product or service" and "financing" as a package deal. A developing country may prefer a fleet of Boeing commercial aircraft on technical grounds but may end up with a fleet of Soviet aircraft because of the financing aspect of the alternative "package".

Proposition 2: Be clear on what is being exported (imported) and on the components within the package.

If the appearance or the reality of imperialism in connection with aid is to be avoided both parties must be clear on what the aid is. If the recipient country wants the aid it is because the package is acceptable. It is fair enough for the recipient country to attempt to obtain the best and largest package possible. At the same time the donor country or organization has its own goals which may or may not be clearly on the table. In most instances the donor is in the stronger bargaining position and so we must recognize that the charge of imperialism can always be leveled.

Much of the accounting education which exists in developing countries emerged as a by-product or minor aspect of larger packages. The larger packages were the foreign industrial and commercial investments. Along with the investments came expatriate staff, including accountants and their training of local staff. The training necessarily included the systems and procedures dictated by head office and the financial reporting models which governed the financial reports back to the investors. Thus we find that the sometimes encountered charge of accounting imperialism is probably more a reaction to the larger package which surrounded the development of accounting within a particular country.

SOME SPECIFICS FOR CANADA

As a polite visitor, Professor Mueller has avoided telling us the specifics of our responsibilities here in Canada. If there is time in the question period, I hope he can be a little more specific with respect to the responsibilities he feels personally or the responsibilities he feels are appropriate for academics in the U.S. Let me suggest a few specific responsibilities that I think are appropriate to Canada

1. It is our responsibility to make some spaces in our university accounting programs available to foreign students. I am thinking primarily of graduate level study unless there is no undergraduate level program available to them domestically. I am referring to foreign students who by contractual arrangement or otherwise will be returning to their home country on the completion of their studies. As enrollment limits become common in business programs across the country this position may be politically difficult to sustain.

2. In Canada, with education a provincial responsibility, the Universities are largely provincially funded. Foreign aid is a federal responsibility. We badly need a bridge that will connect the federal funds for foreign aid, with the university programs which can provide some of the assistance. In recent years the Canadian Federation of Deans of Management and Administrative Studies has been working more closely with The Canadian International Development Agency (CIDA). Still there is a role for the CAAA to lobby CIDA for graduate level scholarships in accounting as part of our foreign aid. The primary rationale is that a healthy accounting infrastructure is a corequisite if foreign aid in other fields, as diverse as medicine and agriculture for example, are to prove effective.

3. In British Columbia, two of the professional accounting bodies have recently launched overseas ventures. The CMA's and the CGA's are offering their programs in Hong Kong. Such initiatives have the potential to be a significantly important mechanism for strengthening the accounting infrastructure in other countries. As a minimum we should applaud these efforts. Further we should be of whatever assistance we can to these and other private sector organizations which undertake similar initiatives.

4. Last, and most puzzling to me personally, is the effectiveness of participation in the development of accounting programs in overseas universities. I have participated in two such ventures. Sometimes they seem to

work and sometimes not. I make three suggestions.
1) the program must be of a relatively long term--probably 10 years.
2) the local university and the government which supports it must be thoroughly committed to the program.
3) there must be a component of graduate study for nationals of the developing countries to study in the donor country.

Even if all these "ideal" conditions are not met, and an overseas program is going ahead, and you are asked to participate. Give it some serious thought. It can be an exceptionally rewarding experience.

CONCLUSION

Let me close with two final points. First a hearty thanks to Prof. Mueller for sharing his extensive expertise in international accounting and its relationship to accounting education and scholarship. The second is to challenge you to identify for yourself and for our association your role and our role in assisting the developing countries.

Here let me suggest a specific foreign aid model. It is that we supply education and training in North American in our North American model. The foreign nationals return to their country and are the ones responsible for the adoption or adaptation of that model in their own country. They write the texts books, they prepare the courses and the training manuals and they assume the responsibility for justifying to their countrymen the model they adopt and the route of implementation they advocate.

PROCESS VS SUBSTANCE
If the "educate them here and send them home" view suggested above is adopted then the emphasis on process as distinct from substance is of considerable importance.

Let me give you one example of what I mean. In the North American Model accounting is introduced via financial accounting with an emphasis on rules and conventions. We could choose to introduce the subject via management accounting with an emphasis on usefulness with little in the way of rules.
VALUES
North America values efficiency and privacy highly.
EFFICIENCY
PRIVACY AND DISCLOSURE
EDUCATION AND TRAINING
UNIVERSITIES AND BUSINESS PROGRAMS
We must be careful not to think of accounting education, training, and research in isolation from management. At the same time we must be conscious of our model which tends to link them via a business school environment.

SUBJECT MATTER

SEQUENCING
LINKS WITH PROFESSION
OTHER ASPECTS
-Need for greater emphasis on internal control.
-Need for a value for money approach in both the public and private sector.
-Develop disclosure as a control mechanism and search for other control mechanisms.
-CMA in Malaysia, CGA in Hong Kong.

CAAA 1988 Conference
University of Windsor

Frank Dougherty
David Bateman
Faculty of Commerce
Saint Mary's University

AVOIDING THE TREND TOWARDS ALL MULTIPLE-CHOICE EXAMINATIONS IN ACCOUNTING

Abstract

This paper discusses the delicate and controversial issue of which method of examination (multiple-choice versus essay problems) is most appropriate for testing the knowledge level of accounting students (both professional and university). The authors' review of the literature indicates that research has not clearly indicated any one testing method as being superior. The authors argue that much of the conroversy around this issue stems from unclear objectives of the examination process which must be properly addressed. Recent studies of U.S. Professional Accounting Examinations (C.P.A.) have concluded that 100% multiple-choice examinations should be conducted. The authors caution that the reliability of multiple-choice examinations is not a substitute for relevance to the objectives of the education process, i.e., to produce educated accountants who have the ability to analyze and research problems and to effectively communicate their solutions to an interested public.

Introduction

The last decade has seen a period of continuous change in the accounting education arena. With an ever increasing body of knowledge developing in accounting, much debate has surrounded the issue of the most appropriate means by which to test accounting students' (both at the university and the professional level) comprehension of accounting knowledge and skills. The major impetus for this paper is fourfold; one, to identify the changing educational environment of today's accountant and its impact on the educational process; two, to address the issues raised in Mitchell Rothkoft's [1987] paper on "No More Essay Questions on the Uniform CPA Examination"; three, to examine the the hypothesis that the cognitive, philosophical and attitudinal approach of accounting students to learning and studying for the Essay-Problem examination (EP) versus the Multiple-Choice item examination (MC) differs considerably; and four, to attempt to deter the possible increased usage of MC examinations at both the university and the professional level by arguing the negative consequences identified in point three above.

The Educational Process in a Changing Environment

The rapid growth of information and technology is a factor which must be dealt with by the contemporary accountant. In order to do so, a more sophisticated type of education will be required to enable accounting students to

cope with the new demands that will be placed on them in the future. If as Naisbett [1982] predicts, the accelerated rate of knowledge growth continues (doubling every 20 months), educators must find new ways to deal with this knowledge explosion. Re-examination of some of the basic premises of our educational system must be performed. Certainly the goal of obtaining knowledge as a requisite for the higher order skills of comprehension, application, analysis, evaluation and synthesis is still of value. However, in lieu of the inherent limitations of the human brain and the exponential growth of knowledge in all areas of society, the question raised is: are educational strategies, which focus on the acquisition of knowledge, not ill suited for the information society of the 1990's?

As Bushby [1986] points out, the volume of information generated in any profession exceeds cerebral capacity for storage. Cerebral evolution has not kept pace with information evolution. This discrepancy has led to a very controversial issue which is prevalent in our profession and our educational systems; namely, that of depth versus breadth (generalist versus specialist). Although these directions represent extremities, providing either educational route to our students in their university education could prove to be an inefficient and/or ineffective allocation of educational resources. The knowledge explosion which is occurring in our society (our profession and the subject of accounting is not exempt, witness the complexity of accounting standards and tax laws, as well as the burden of increased expectations from the public), should force educational bodies to redefine the goals of education. As Bushby concludes: "Our goals as educators can no longer be to eliminate ignorance, it must be to teach our students how to deal with their ignorance..." p.16.

If knowledge is viewed as the purpose of higher learning, we are all too often directing our students through an educational experience filled with too much memorization. A better educational objective would be to develop our students skills and abilities to process, analyze and interpret information. An acceptance of this proposition implies that we must also choose the most appropriate means of testing the acquisition of these higher level skills, as well as attempting to use information tools as a means of effectively accomplishing our educational objectives. Through the use of the computer (primarily micros because of their friendly interface and accessability), we should be able to extend the power of the human mind. With the correct set of skills, our graduates should be able to use the computer as an "ignorance reducer" or as a window to directed knowledge acquisition. As Bushby emphasizes, "by providing an efficient means to store, retrieve and reorganize information, computer technology gives educators the ability to redirect educational emphasis to create a balance between knowledge acquisition, knowledge utilization, behavioral characteristics and practical applications." It should no longer be necessary for students or members of society to have to know information before they can attemp to use it, rather it will only be necessary to know what information is available.

To set a goal for the education process, it is important to understand contemporary accounting and the role of the accountant. The contemporary accountant is not a storer of facts. With the proliferation and increased use of information technology, increased complexity of the business environment and the tremendous increase in the body of accounting knowledge he/she must have cognitive, research and communicative skills. Communication skills and the ability to analyze problems and research solutions are important tools in the accountant's repertoire. We believe that Gibbins [1987] is correct in his

assessment that such skills (JADE - judgment, analysis, decision-making, and evaluation) cannot be addressed too early in a student's educational process, (i.e., in introductory accounting courses). The challenge which we now face as accounting educators is to develop the most appropriate means of testing the knowledge levels and skills of our accounting students. It would be somewhat negligent on our part if we were to accept the changing educational objectives within our educational process but fail to follow its effect through to the measurement step of that same process, the examination.

The Education and Training of the Professional Accountant

The professional accountant acquires the necessary education and training via a combined process of formal academic education, practical experience, and personal post-professional qualification study. Implicit in this educational delivery system is the proper placing of each phase of the process, i.e., the conceptual, fundamental education should take place at the university, with the practical and specialized on-the-job training being acquired in the work place. The success of the on-the-job training is dependent on the cognitive and communication skills acquired in his/her university education.

A university education is defined by Ferguson & Ferguson [1983] as "a mind-broadening experience that exposes the students to a variety of knowledge much of which may have no direct application in his life, but will increase understanding and appreciation of the world around him." This education is an essential requirement for a professional career. An American study by Bedford [1987] on college curriculum reported to the American Accounting Association that universities should adopt "a minimum required curriculum of nine basic intellectual, aesthetic and philosophical experiences". These basic skills were described as:

1) The ability to think abstractly and perform critical analysis,

2) Literacy in writing, reading, speaking and listening,

3) Understanding numerical data,

4) Historical consciousness,

5) Being "intellectually at ease with science",

6) Values, or "the capacity to make informed and responsible moral choices",

7) Appreciation of the arts,

8) International and multicultural experiences, and

9) Study in depth.

Following upon a broad, fundamental and conceptual university education, the professional accountant must hone his/her skills by acquiring the necessary practical on-the-job experience and training. Although accounting is both an academic and a practical discipline, one furthers his/her accounting knowledge by working in the field. Practical experience is enhanced by attendance

at topical seminars and conferences, as well as by a life-long program of reading and study in the professional's area(s) of interest and experience. This continued life-long education of a professional accountant presupposes an excellent education.

Examinations: An Imperfect Measurement Process

The question of which testing method, essay, essay-problem, short answer, multiple-choice, true-false etc., is the most appropriate to examine students' knowledge has been with us for years. A review of the literature since as early as the 1920's does not support any particular type of testing as being the "best". The literature, particularly educational journals, abounds with papers and articles indicating that generally the results of the various methods used in examinations are highly correlated when measuring or grading students. Patterson, as far back as [1926] found, "that relative rank is essentially the same for student performance on tests regardless of mode".

The education of an individual is not an examination, but a process of learning; one can learn without being examined. This education includes the capacity to think, to mentally store facts and ideas and to be able to, through thought processes, communicate intelligently what has been learned. Although an advocate of MC, Triebler [1980] states that "tests should provide a stimulus for learning.... The essay test can be valuable because it allows the trainees freedom to express their ideas in their own words." We believe that MC examinations fail to provide a stimulating learning environment for the student, research by Grzelkowski [1987] found that:

> "The pedagogical merits of the multiple-choice exam has been debated for some time....Some of the debate has focussed on whether the multiple-choice exam meets its intent as a test of a student's knowledge, or whether it is a test of a student's skills in how to take a test.... A further criticism of the multiple-choice exam is that it does not assist the student in transmitting more complex ideas and knowledge which s/he has learned. Rather it is a measure of the student's ability to memorize and to 'regurgitate'."

In the past, colleges and universities operated under a tutorial system, and presently in the United Kingdom this system is practiced in many graduate programs, where no written examinations are given. Examinations are required in colleges and universities today because of mass education, requiring large classes. The authors realize the measuring and grading problems brought on by large class sizes, but even under such circumstances economics and convenience of testing are not part of a "good education".

It is well to repeat that the research, Dougherty [1972] and Frakes and Lathen [1985], does support the fact that grades produced by a well constructed MC examination correlate highly with those produced by an EP examination and that MC grades are more objective, economical in time and in some cases, monetary. However, it is accepted [Rath 1983] that "students generally do not see subjective grading as ipso facto unfair." To the contrary we agree with Grzelkowski [1987] that there "seemed to be an understanding that ...objective measurable standards demeans the evaluative process in some respects." In MC

exams students "do not experience the kinds of free intellectual exchange which they anticipated ....instead, they communicate through exams which do not test their learning, but rather knowledge and ability to take tests."

Frederiksen [1984] notes that "little research seems to have been done (only two studies) where measurement of higher level cognitive skills was attempted....this illustrates the difficulty of developing MC tests for use in situations where measurement of higher level cognitive skills would clearly be appropriate." Breland and Gaynor [1979] in their study assessing writing skills, concluded that EP and MC tests "tap similar skills", but that MC "measures lack face validity and credibility... and they tend to deliver a message to students that writing is not important." Gay's [1980] study on retention noted that "SA (short-answer) tests logically seem preferable over MC since they require recall....This proposition, supported by research, indicates that difficult tests promote greater learning (see Sax & Reade, 1964)". The results of Gay's study indicated that SA testing results in equal or greater retention than MC testing,....one strategy for maximizing retention would seem to be the use of SA testing whenever feasible."

Two papers, Strathmann [1979] and Roizen [1984] on reading comprehension of English as a second language found that "research revealed that students perform almost identically when answering open-ended or multiple-choice items; however, the open-ended items proved to be the better testers of reading comprehension" [Roizen 1984]. Strathmann [1979] came to doubt that the MC test gives the most reliable indication of student ability. On essay type questions, she stated that "students liked the test. They found the variety in question form interesting and the mental exercise it generated stimulating." Is this not what we are trying to accomplish as educators, since essay exams can and should be considered an integral part of the education process and not simply the end point within a course.

Grading is not the only issue, although from the student's point of view, an examination is a means to an end, i.e., pass, with the best grade possible. From the academic point of view, examinations should not be reviewed so superficially. We are all aware of the imperfections which exist in any examination technique; however, the educator has a responsibility to attempt to at least achieve congruency with the objectives of the educational process (JADE skills) and the examination technique employed. Any examination should provide a process of testing, orally or in writing, the ability or knowledge of candidates. Although very little research has been done on the subject, we agree with Anastasi [1969] that the student will study and learn differently depending on the type of examination given and, as a result "...the content and type of learning to be tested would largely determine the most appropriate item form." This contention is further supported by Frederiksen's [1984] study which indicated that multiple-choice tests tend not to measure the more complex cognitive abilities.

After a review of the literature, the authors consider the MC examination inappropriate for measuring the comprehension, analytical, and cognitive skills necessary to accredit a professional accountant. MC dwells on facts rather than emphasize the application of knowledge, concepts, and principles. The main reason EP item questions are preferable to MC ones is that they require a control and an organization of the material being questioned. MC questions test the most superficial knowledge of "the facts". But it is in the marshaling of "the facts", the presentation of a view about the material that

one is best able to "see" the educated mind at work. Indeed the educator ought to be concerned with the imaginative mind, which sees likeness and differences and shades of meaning, that will stand revealed for what it really is in an examination where understanding, imagination and information will display themselves and not with the superficially slick and glib mind which may get through a MC examination. We agree with Travers's [1973] assessment that essay tests are particularly useful for measuring the student's ability to organize his/her thoughts and his/her ability to present arguements for and against particular positions. Are these not the very characteristics we would like to see in our accounting graduates?

Accounting Education and U.S. Trends

Since this paper illustrates a bias toward EP examinations, it behooves us to comment on Rothkopf's [1987] paper entitled "No More Essay Questions on the Uniform CPA Examination." One cannot argue with the practicality of his overwhelming reasons "to discontinue essay questions", but these reasons are merely for expedience and economics. He states that savings would be in excess of two million dollars. Applying the principle of materiality, and considering the number of candidates, this is however an immaterial amount per candidate. His reference to "a practical business point of view" is not a prerequisite to producing a well qualified, knowledgeable, skilled professional. This is a materialistic, short-sighted view when it is considered that the education received is the foundation for a professional's competency to practice and to future professional development programs he/she may engage in. He also stated that "candidates should attain substantially the same grade" since research has illustrated that the comparison of different testing techniques are statistically highly correlated; this however is not the issue for there should be more to the examination than merely the determination of a ranked performance indicator.

In the accounting area, Dougherty [1972] and Frakes and Lathen [1985] found no significant differences in scores between MC and EP examinations. Although these authors found no "significant differences" there were differences for some students. If the methods are supposedly equal, why should a student who achieves a C on a MC examination receive a B on EP examination? Perhaps an examination mode which allows for individual expression and demonstration of reasoned judgement addresses more appropriately the student's cognitive learning styles and skills. We would hope that these "insignificant" differences warrant an educators attention when choosing the type of examination method they might employ.

As stated above, the results correlate highly regardless of the test procedure EP or MC. It is our opinion that it is the theoretical properties between the two test procedures which affect the learning process that are important. The first is the level of cognitive processing and memory required by the two exam types. In the EP type the student is required to use cues presented in the question to search back through his/her memory and recall all the relevant information, but in most MC exams the student must merely recognize a correct answer. The second is sensitivity to learning, MC exams more sensitive to smaller amounts of specific learning whereas EP exams allow the student to throw in everything known about the subject. Although both demand cognitive complexity, EP items tend to be established to measure more complex learning, such as analysis or synthesis, whereas MC items are used more to

asses basic knowledge, comprehension and to some extent application.

Rothkopf states that "the examination must be valid and reliable" and defines valid as "the degree to which a test measures what it purports to measure", but he does not address the more important issue, that is, what are we trying to measure? It is difficult to argue with his statement that "the grading of answers to objective questions... can be 100 percent reliable." His argument that most other professional licensing examinations, legal and medical, consist of 100% objective testing begs the question, does this alone make it right? These issues are reminiscent of the accounting argument between reliability and relevance, the figure may be reliable but not relevant. The latter is true of MC answers as they may be nearly 100 percent reliable i.e., right or wrong, but are they a measure of the student's overall comprehension of the problem or issue? We agree with Zimmerman [1984] that there is considerable evidence that guessing contributes to the error variance of multiple-choice test scores and diminishes test reliability. Several authors have derived explicit formulas that describe the effect of guessing on the reliability of multiple-choice tests. Hopefully, as the educators of tomorrow's professional accountants, we are somewhat concerned that a student's intuitive ability might become a possible determining factor in their accreditation.

The evolution of accounting is well past the bookkeeping era and with the growth in the body of accounting knowledge, combined with the increased complexity of business and non-business organizations today, a higher level of intellectualism is required by the accountant. In other words, accountants require a better education to cope with the demands and expectations placed on them. This topic from the education perspective is extensively addressed in the AAA Future Committee's Special Report Future Accounting Education; Preparing for the Expanding Profession.

The AAA Future Committee's Special report on education [1986] states that "educators cite complaints that many accounting graduates do not know how to communicate, cannot reason logically, and have limited problem-solving ability." It is our view that implementation of total MC examinations will only exacerbate this situation. Collier and Mehrens [1985], however, argue that MC testing will improve classroom performance and they support the reliability and validity of this methodology. But they do not address the issue of the study and learning habits of students when only MC testing is used in evaluating. It is ironic that they then proceed to note that "graduates of colleges and universities lack basic written and verbal skills." They also state that "to improve writing/ speaking/ communication skills...instructors should make written assignments as part of the set of educational objectives....We support the belief that students should be asked to write more often." Could not part of this written experience be found in essay and problem type examinations?

The proponents of an all MC CPA final examination are not without their opponents. Ray Sommerfeld [1987], in his statement before the national conference on proposed changes in the uniform CPA examination stated that the consensus, no vote was taken, of the AAA Executive Committee was consistent with the views of the prior Executive Committee, namely "that it would oppose any movement toward a completely objective examination." The following concerns echo many of the issues which have been summerized in this paper:

(1) ... that the ability of CPA candidates to structure their own analysis as opposed to fitting their analysis into an examiner's predetermined

structure is an extremely important skill, and we fear that an objective exam will minimize the significance of this ability. Both essay questions and lengthy numerical problems require a candidate to demonstrate this skill to a considerable degree, unlike most objective questions.

(2) .... that a decision to convert the CPA exam to an all objective format will have a negative impact on accounting education by reducing the emphasis (both in textbooks and classrooms) placed on the more subjective and judgmental dimensions of accounting.

(3) .... that although the Board presents strong evidence to support its own conclusion that an all objective examination could effectively test the relevant KSAs of the CPA, we find little or no evidence that anyone has to date undertaken the extensive research, or made the necessary financial commitment, that will be required if that conclusion is to become a reality.

It is obvious, from the proceeding, that this issue is far from being resolved. It is our hope that an awareness of the basic issues might help to avoid our seemingly natural tendency to follow the lead of our southern colleagues.

Summary and conclusions

Although controversy still exists in establishing the optimal examination testing alternative, we feel that we have shown that it is essential that the MC method not be selected as the sole method of examination in accounting courses as has been proposed for American CPA exams. Although, as a whole, the Canadian environment has not seen the same movement towards the use of MC examinations, the potential and temptations for such a move are evident and growing. As the number of CA candidates writing the UFE's and the cost of marking their examinations increase, and as the other professional accounting bodies (CMA's & CGA's) move towards a uniform final examination process, the argument for objective and economical MC examinations will raise its nasty head. Let us hope that we can resist these temptations and maintain at least come some semblance of credibility as we try to ensure that the objectives of our educational process (acquisition of accounting knowledge and JADE skills) are consistent with the means of examination of those same skills. If we truly believe that these higher-level cognitive skills are important, then we must take the extra step to ensure that we are, in fact, testing them with the most appropriate measuring device.

At the university level, it is easy to remove oneself from this professional dilemma. However, the tendency for increase usage of MC examinations is ever growing as educational materials provided to accounting instructors move more and more in this direction (student guides, test banks and test generators have a large MC component). With these seemingly well accepted aids it is all too easy for the accounting academic to rationalize their use in an environment of increasing class sizes, and an increased emphasis on time-consuming research. As educators we have a moral responsibility towards the community we serve, to produce well "educated graduates". Hopefully, recognition of this responsibility will allow us to chose our examination and evaluation methods more carefully.

In conclusion, we would like to say that despite our obvious bias against the use of MC examinations we recognize that MC questions can serve a useful purpose, such as, to test knowledge of a wide topical area. It is the selection of this method as the sole or major means of examination to which we object. In our opinion occasional use or partial use in examinations is acceptable as long as those examinations also contain a strong EP component. These issues are far from resolved at present and the need for more pertinent empirical research is obvious. Hopefully, this research will come before contemplating a move such as that proposed by our American counterparts, for we feel that this is an area where not following will keep us ahead.

REFERENCES

AAA Future Committee, "Special Report Future Accounting Education; Preparing for the Expanding Profession", Issues in Accounting Education, Spring 1986, PP. 169-195.

Anastasi, Anne., Psychological Testing, Third Edition 1969, Collier-Macmillan Canada, Ltd., Toronto, Ontario.

Bedford, N. and Shenker, W., "Reorienting Accounting Education," Journal of Accountancy, August 1987, pp. 84-91.

Breland Hunter, M. & Gaynor Judith, L., "A Comparison of Direct and Indirect Assessments of Writing Skill," Journal of Educational Measurement, v16. Summer 1979.

Bushby, Philip W., "Computers in the classroom: Educational Process and Logic Order Skills," Educom Bulletin, v21. Spring 1986, pp. 18-23.

Dougherty, Frank P. "An Evaluation of Multiple-Choice Type Test vs Problem Type used In Accounting," An Unpublished Paper, The Pennsylvania State University, 1972.

Ferguson, W, and Ferguson, D., "The Internal Auditor Training Program", Institute of Intermal Auditors, Inc.

Frakes, Albert H. & Lathen, William C. "A Comparison of Multiple-Choice and problem examinations in Introductory Financial Accounting," Journal of Accounting Education, v3., Spring 1985.

Frederiksen, Norman., "Influences of Testing on Teaching and Learning," American Psychologist, March 1984, pp. 193-202.

Gay, Lorraine R., "The Comparative effects of Multiple-Choice versus Short-Answer Tests on Retention," Journal of Educational Measurement, v17, Spring 1980. PP. 45-50.

Gibbins, Michael., "Accounting Curriculum Development an Alberta Example," CA Magazine, November 1987, pp. 60-65.

Grzelkowski, Kathryn P., "A Journey toward humanistic Testing," Teaching Sociology, v15 pp. 27-32, January 1987

Naisbett, John., Megatrends, Warner Books Inc., New York, N.Y., 1982

Patterson, D.G., "Do New and Old Type Examinations Measure Different Mental Functions?, School and Society, 1926, v24, pp. 246-248.

Raths, James., Wojtaszek-Healy, Madonna., Kubo Della-Piana, Connie., "Grading Problems: A matter of Communication," Journal of Educational Research, v80 January/February 1987, pp. 133-137.

Roizen, Merle A., "Test Performance Vis A Vis Test-taking Strategies in Reading Comprehension of English as a Second Language," Educational Resources Information Center, ED 252053.

Rothkopf, Mitchell., "No More Essay Questions on the Uniform CPA Examination," Accounting Horizons, December 1987, pp. 79-85.

Sommerfeld, Ray M., "Statement of .... President of the American Accounting Association Before the National Conference on Proposed Changes in the Uniform CPA Examination," Accounting Horizons, December 1987 pp. 87-91.

Stathmann, Stella., "Testing Reading Comprehension: Multiple-choice v. Short-answer Questions," English Language Teaching, v33. 78/79, p. 1128.

Svinicki, Marilla., Koch, Bill., "The Great Essay/Multiple Choice Debate: Different Strokes for Different Folks," Center for teaching Effectiveness Newsletter, v5. November 1983.

Tanner, David E. "Achievement as a Function of Abstractness and Cognitive Level", Paper presented at the annual meeting of the American Educational Research San Fransisco, CA, April 1986, pp. 16-20.

Travers, Robert M., Educational Psychology, The Macmillian Company, New York, p. 215.

Trieber, Marshall J., "The Use of Multiple-Choice for Testing," Training and Development Journal, October 1980, P. 24.

Zimmerman, Donald W., Williams, Richard H., Symons, Debbra L., "Empirical Estimates of the Comparative Reliability of Matching Tests and Multiple-Choice Tests," Journal of Experimental Education, Spring 1984, pp. 179-182.

AN EXAMINATION OF THE MASTER'S DEGREE PROGRAM IN ACCOUNTANCY

Robert Bloom
Professor
Department of Accounting
John Carroll University
University Heights, Ohio

M. Ahmed Naciri
Professor
Department des Sciences Comptables
University of Québec at Montréal
Montreal, Quebec

I. INTRODUCTION

In recent years, there has been much consideration about instituting Master of Science (M.Sc.) programs in Accountancy at two Montreal universities--the University of Québec at Montréal (UQAM) and Concordia University. Indeed, such a program has already been established at UQAM. Accordingly, in this paper, we examine the recent development of Master of Science in Accountancy and Master of Accountancy (M.Acc.) programs in North America. Background information on several of these programs in the United State and Canada is furnished. The rationale and expectations for these programs are examined. Additionally, the nature and objectives of such existing programs are contrasted with MBA programs and Chartered Accountancy diploma programs. We compare a number of masters programs in accountancy and examine the problems of developing and introducing such programs.

II. DISCUSSION

There appear to be too many MBA programs in North America, especially diluted, unaccredited courses of study. In recent years, MBA programs, in view of their emphasis on generalized management education, have been losing much of their lustre. Be that as it may, few MBA programs are producing accounting concentrators or majors.

The nature and scope of accounting and auditing has widened, if not exploded, in recent years. Significant change is a fact of life in these disciplines. A master's program in accountancy is intended to meet the new challenges of the ever-changing professional disciplines of accounting and auditing. MBA programs are primarily concerned with training organizational managers to be broad generalists rather than specialized accountants. Few MBA programs require their students to prepare any thesis, never mind a research-oriented one.

The rationale for a master's program in accountancy (call it what you will: Master of Science in Accountancy, Master of Accountancy) is the increasing need for intensive accounting specialization at the graduate level. Undergraduate, Bachelor of Commerce, degrees in Accountancy invariably have a professional, CA (or other) examination

orientation. CA diploma programs are concerned with the preparation of candidates for the CA examination, stressing existing as opposed to future practice, and do not grant graduate degrees. Additionally, while MBA and CA programs have a decidedly professional focus, a number of masters in accountancy programs have a research dimension, endeavoring to educate students to do research in the broad realm of accountancy. Moreover, a master's program in Accountancy can serve as a feeder or prelude to university Ph.D. programs. Put another way, a masters in accountancy can be developed so as to articulate with existing doctoral programs in business,[1] and can be tailor-made to fit the needs of each student.

The objectives of such a master's program in our view should include the following:

(1) to provide an in-depth course of study, emphasizing concepts, theories, analytical techniques, research methodology, and applications.

(2) to enable the student to specialize in a particular area of accountancy--e.g., financial, managerial, auditing, not-for-profit.

(3) to alleviate the acute shortage of qualified accountancy professors at the university and college levels.

(4) to educate "technical" accountants for research departments and accounting consultants for management advisory service departments in major accountancy firms.

The objectives of the State University of New York at Binghamton program are to (SUNY--Binghamton Catalogue, 1984-86):

> ...provide broad training and emphasize conceptual understanding, the mastery of analytical techniques, and the rigorous use of logical reasoning. It stresses new approaches in accounting theory and the solution of current professional problems, offering the student the opportunity to understand the roles of related disciplines like behavioral science, economics, and management information systems in modern accounting practice. For terminal master's degree students, it offers a broad range of courses in auditing, taxation, and both financial and managerial accounting practices. For students ultimately interested in study at the Ph.D. level, it provides a strong theoretical base in the history of accounting thought and the structure of financial accounting theory.

The annual student calendar (or catalogue) of the University of Saskatchewan points to a greater demand for accounting majors to pursue graduate study, indicating that holders of a master's degree in accountancy have broad career opportunities in community college and university teaching, in business and governmental organizations, and in public ac-

---

1. We should emphasize the acute shortage of Ph.D.s in Accountancy in North America and elsewhere.

counting firms. As the calendar asserts: "In these respects, graduate education will support performance in the role of change-agent, a role critical to the continued development of the discipline." Stated differently, such a master's program provides advanced study in order to serve as a catalyst for research and professional development in accountancy.

The importance of the research facet of masters programs in accountancy should not be underplayed. Not only can such programs seek to develop students' research skills and capabilities, but also to serve as a stimulus toward faculty research. Research to universities is analogous to R and D to a corporation. The virtual absence of programs of advanced graduate study in accountancy, especially in Canada, is undoubtedly one reason why so little research is conducted by Canadian accounting academics. A master's program in accountancy can be designed to foster research by the faculty teaching in the program, perhaps through collaborative research projects with the students enrolled. As the Master of Science in Accountancy degree proposal of the University of Québec at Montréal asserts (1984):

> ...Research is indeed the basis of all innovation and applies to individuals working in a particular sector. Research in...accounting...helps the members of the profession to improve their understanding of the impact of the information and the reports which they prepare. It helps to clarify, for example, the information needs of investors and administrators and therefore helps the profession to better respond to the expectations of our society. Besides the fact that at the academic level, research is an indispensable activity for the renewal of intellectual capital.

Our survey of a sample of 25 existing masters programs in accountancy in North America reflects the two basic purposes of such programs: to provide a firm background for the accounting profession (i.e., public, industry, government) and to provide an intensive analysis of the discipline. The majority of the M.S. programs in accountancy (e.g., University of Alabama, Golden Gate University, Arizona State University, University of Illinois at Chicago, University of Virginia at SUNY--Binghamton) are concerned with preparing students for public and private sector accounting. The main purpose is to educate the students to become CPAs. Other universities (e.g., University of Saskatchewan) are more concerned with developing an understanding of the meaning of modern accounting and developing students' research skills. Still other programs, e.g., at the University of British Columbia, can be either research-oriented or professionally-oriented depending on the individual student's interests.

James Madison University in Virginia, for example, emphasizes the development of professional accountants. While the specific purpose of Kent State's program is not stated, judging from its course requirements it appears that furnishing a solid grounding in accounting and business is its aim. Because of this, the program probably leads to a variety of career paths.

As far as course loads go, there is much variety among the programs. At Kent State, if a student has an undergraduate accounting

background, then he/she need only complete 48 credits (4 semesters); otherwise he must complete a 49 credit background course program as well. The courses include accounting (theory, financial, and electives), economics, management, finance, and a three-month internship with a CPA firm. Most of the programs examined appear to follow this course structure. Some require additional accounting courses, including Arizona State University and Golden Gate University. One university program which seems to be quite unique is Saskatchewan's. Only 4 to 5 full-time students are allowed to enroll in this program each year. Five courses are required along with a thesis, and the only courses offered are accounting courses.

Most universities do not require a thesis or research paper.[2] Those that do include Saskatchewan, British Columbia (optional), James Madison (optional) and Arizona State (optional).

Various programs allow for specialization. The University of Illinois at Chicago, for example, offers three areas of specialization: financial, managerial, and auditing. SUNY--Binghamton has two areas of concentration, public and management accounting. Arizona State offers an emphasis in financial, managerial or taxation.

The Master's program in Accountancy differs from the MBA program in several ways. At Golden Gate University in California, for example, the M.S. program is geared to those engaged in, or preparing to enter, public accounting while the MBA (Accounting) is for those engaged in, or preparing to enter, management accounting, internal auditing, or governmental accounting. The two programs also differ in terms of the number of credits that must be completed and the number of accounting courses which must be taken.

Our analysis of selected aspects of twenty-five Masters programs in Accountancy appears in Exhibit I.

A Joint UQAM/Concordia Proposal

UQAM and Concordia have considered the development of an affiliated Master of Science in Accountancy program whereby students could take the same courses at either university. Additionally, faculty from both UQAM and Concordia would jointly supervise students' research theses. In both programs the courses, all of which are three graduate credits, would be the following:

Required

1. Seminar in Financial Accounting
2. Objectives and Methods of Evaluation in Auditing
3. Seminar in Managerial Accounting
4. Research Methodology in Accounting
5. Computers in Accounting

---

2. The reasons are apparently the professional orientation rather than research orientation of many of the programs and the time-consuming nature of a thesis requirement.

Electives

1. Evolution of Accounting Thought
2. Specialized Subjects in Financial Accounting I
3. Specialized Subjects in Financial Accounting II
4. Accounting Information Systems
5. Specialized Subjects in Managerial Accounting I
6. Specialized Subjects in Managerial Accounting II
7. Tax Planning
8. Specialized Topics in Auditing
9. Accounting for Not-for-Profit Enterprises
10. International Accounting
11. Accounting for Small and Medium-size Business Firms
12. Thesis Seminar

In the proposed Concordia program, which is to be part of an umbrella M.Sc. in Administration, offered by its Faculty of Commerce and Administration, there would be 9 credits of core courses in financial economics, management, and quantitative methods besides 21 credits in required and elective accountancy courses from those listed above, and 15 credits in the thesis. In the UQAM program, there are no interdisciplinary core courses, but there are 15 required credits as listed above and 18 or 9 elective credits from those listed above and beyond, depending on whether the thesis option is 12 or 21 credits respectively.

III. CONCLUDING COMMENTS

No Master of Accountancy program is currently offered in the province of Québec, apart from a Master of Taxation at the University of Sherbrooke. We contend that a research-oriented program providing in-depth education is acutely needed at this time in Québec, and beyond. The only other programs in Canada are at the University of Saskatchewan, which is a limited, full-time program only in Accountancy, aimed at a small segment of the marketplace with only a handful of new students admitted each year, and at the University of British Columbia, which also has very few students, most of whom are absorbed into its doctoral program prior to completion of the M.Sc. We have to face up to the fact that there is, and will continue to be for many years, a dearth of Ph.D.s in Accountancy, and a master's degree in accountancy may well be the next best thing to the Ph.D. in accountancy, apart from a Ph.D. in a cognate area. Moreover, the master's degree in accountancy can be viewed as a specialized step towards the doctorate. Programs are needed at the graduate level to prepare professional, research-oriented accountants. There are all too few graduate accountancy programs period, whether or not they provide an intensive analysis, specialized academic training, exposure to research methodology, and a thesis as a requirement.

As Seidler[3] observes, graduate programs in accountancy are few and far between. Yet "the four-year undergraduate preparation that was completely adequate 50 years ago is now strained by the explosion of

---

3. L. J. Seidler, "Adding Up the Change in Accounting," NYU Business, Spring/Summer 1984, pp. 13-17.

knowledge, both in accounting and society in general." (p. 17) The undergraduate program is all too limited for students to prepare for a professional discipline. Seidler further asserts (p. 17):

> The first priority is the development of high quality graduate professional schools or programs for accountants, with six or seven year programs, comparable to those offered in the law. Aside from the increased technical training, such programs would offer the ability to deal more effectively with the complexities of the modern economy, financing and government regulation....

Agreeing to the objectives of a master's program in accountancy is one thing, but finding the resources to establish such a program is quite another matter. Nevertheless, it is our conviction that the time is ripe for a vigorous push to establish research-oriented masters programs in accountancy.

SELECTED REFERENCES

Cusick, R., H. K. Monk, and E. Pavlock. "The National CPE Curriculum." The Journal of Accountancy, October 1985.

Ellyson, R., A. T. Nelson, and J. MacNeill. "Educating Tomorrow's CPA's." The Journal of Accountancy, October 1985.

Mills, R. H. "Views on Education and Experience Requirements." The Journal of Accountancy, October 1985.

Seidler, L. J. "Adding Up the Change in Accounting." NYU Business, Spring/Summer 1984.

C.A. CANDIDATES: THEIR ATTRIBUTES AND PERFORMANCE

by

M. Rai Kapoor, M.B.A., Ph.D., C.M.A.
Associate Professor of Accountancy
Concordia University
Montréal

C.A. CANDIDATES: THEIR ATTRIBUTES AND PERFORMANCE

The Uniform Final Examination (UFE) is conducted annually by the Canadian Institute of Chartered Accountants (CICA) on a national basis for entry to the profession of chartered accountancy in Canada. The UFE is, in most cases, the last hurdle to become a chartered accountant (CA), but, as would be expected, preparations of aspirants to the profession stretch at least over a three or four-year period, as the minimum educational requirement is a baccalaureate degree (in accounting or equivalent).

One of the concerns of accounting educators and practitioners has been the failure rate in the UFE. On the average, 46 to 49 percent of students have failed in the examination (on a national basis) during the last few years. The contention of accounting educators is that it is not because the standards are too high that so large a portion fail (see, e.g., Rosen, 1978). Whatever the reason, it seems an unconscionable waste of resources to allow students to study and work in a program for three or four years only to meet with an almost 50-50 chance of success in the professional examination. According to Rosen (1982), one of the most prominent accounting educators and writers, "The lack of evidence about the crisis in education is probably the biggest culprit... Who says we have more poor-quality students? Who says we need more stringent entrance requirements? Who says that we have poor instructors? Are we not doing just fine as we are?"

The purpose of this paper is to adduce some evidence by reporting the results of an analysis of the educational background and performance of 633 candidates, who took the UFE for the first time in Quebec in September 1984. The balance of the paper is organized as follows: Section one discusses the sample and the variables studied. Section two deals with the analysis and the findings. Finally, section three presents summary and conclusions of the study.

The Sample

The data for the study was made available by the Ordre des comptables agréés du Québec (OCAQ) concerning 1,314 candidates who took the UFE in September 1984 in the Province of Quebec. In addition to details, such as age, sex, practical experience, number of prior attempts, score in each of the four papers and in total, the OCAQ also provided university transcripts of studies at the undergraduate and graduate levels of most candidates. The UFE comprises four four-hour papers worth 100 marks each with a combined passing mark requirement of 60%, i.e., 240 marks. In contrast to total marks, candidate's score in the individual papers was divulged by OCAQ not in actual marks, but on a scale ranging from one to ten, one being the highest grade.

The sample was limited to those candidates who took the UFE for the first time in 1984. It is known from the annual statistical analysis of the UFE results that performance of the repeaters has always been below that of the first-time candidates (CICA, 1985). Therefore, to have a sample representative of all types of candidates and to avoid over-representation of poorer quality candidates, repeaters (490) were excluded. Further screening involved cases (191) in which university transcripts were either not made available by the OCAQ, or were illegible, or non-usable for some other reason. Eventually, therefore, the overall sample of 633 candidates was used in the analysis.

Each candidate's transcript was divided into various categories of courses within three major classes, viz., general, business, and accounting education, with reference to the titles of courses listed and their descriptive content in the relevant university calendar. Liberal or general education was defined, with particular attention to the recommendations of the American Assembly of Collegiate Schools of Business (AACSB, 1983), as the nonspecialized component of an undergraduate program in accounting as opposed to the courses identified as part of the area of concentration and its supporting disciplines. These courses are often referred to as "arts and sciences".

The Analysis and the Findings

Table 1 provides chi square (χ^2) statistics for the predictor variables with their levels of significance shown in the parenthesis. χ^2 can be used to test whether two variables are related or are independent. Observe that at $\leq$ .05 level of significance, the explanatory variables most related to examination performance are the grade point averages for general education (GPAG), general business (GPAB), accounting (GPAA), the degree program (GPADEG) and the CA diploma/additional courses (GPAADD), followed by gender (SEX), credit hours failed in the degree program (FRDEG), credit hours completed in the CA diploma/additional courses (HRSADD), credit hours failed in accounting (FRA), credit hours completed in general education (HRSG), and years since completion of university studies (OUT). None of the other variables, viz., age, experience in a C.A.'s office (EXP), credit hours completed in business (HRSB), in accounting courses (HRSA) and in the overall degree program (HRSDEG), and credit hours failed in business (FRB) and in additional course work (FRADD), depicted significant relationship with any of the response variables, viz., scores in Paper I (PI), Paper II (PII), Paper III (PIII), Paper IV (PIV), and total score (TOTAL) in the UFE.

It may, however, be mentioned that the chi square χ^2

TABLE 1

Chi Square (χ^2) Test of Independence
(Significance levels in parenthesis)

	AGE	SEX	EXP	OUT	GPAG	GPAB	GPAA	GPA-DEG	GPA-ADD	HRSG	HRSB	HRSA	HRS-DEG	HRS-ADD	FRB	FRA	FR-DEG	FR-ADD
P I	13.71 (.32)	1.80 (.77)	23.88 (.25)	22.42 (.76)	33.91 (.03)	52.28 (.00)	120.55 (.00)	86.58 (.00)	41.95 (.00)	22.43 (.13)	8.20 (.77)	12.88 (.68)	14.17 (.59)	13.40 (.64)	3.02 (.55)	14.64 (.07)	29.79 (.00)	22.93 (.11)
P II	7.60 (.81)	11.56 (.02)	25.74 (.17)	45.65 (.02)	63.02 (.00)	98.02 (.00)	201.70 (.00)	165.59 (.00)	56.29 (.00)	8.03 (.95)	9.83 (.63)	21.14 (.17)	14.33 (.57)	30.39 (.02)	4.21 (.38)	15.67 (.05)	29.60 (.00)	17.71 (.34)
P III	10.52 (.57)	19.06 (.00)	29.97 (.07)	34.97 (.17)	49.18 (.00)	86.77 (.00)	147.69 (.00)	119.09 (.00)	44.48 (.00)	28.03 (.03)	12.33 (.42)	14.62 (.55)	14.41 (.57)	32.53 (.01)	4.31 (.36)	24.51 (.00)	19.35 (.08)	21.38 (.16)
P IV	11.44 (.49)	7.75 (.10)	19.32 (.50)	23.73 (.69)	59.11 (.00)	65.41 (.00)	183.97 (.00)	134.05 (.00)	43.55 (.00)	8.21 (.94)	11.05 (.52)	13.93 (.60)	25.48 (.06)	17.82 (.33)	3.30 (.51)	11.94 (.15)	21.24 (.05)	16.28 (.43)
TOTAL	4.12 (.90)	8.05 (.04)	20.77 (.14)	22.77 (.36)	56.12 (.00)	95.21 (.00)	180.73 (.00)	141.25 (.00)	61.07 (.00)	10.31 (.59)	9.86 (.36)	13.95 (.30)	10.14 (.60)	30.60 (.00)	.31 (.96)	10.05 (.12)	17.02 (.05)	6.24 (.90)

test is based on one-to-one relationship and uses categorized data. The information provided should, therefore, be viewed as preliminary in nature.

Table 2 provides an insight into the performance and background of all candidates in the sample who took the UFE in Quebec in 1984. The arithmetic mean of the total score in the exam was 242.7 with a mode of 240, and a median of 245.8 against the required passing mark of 240, i.e., 60 per cent of the maximum score of 400. The total score ranged from a low of 73 to a high of 387 with a standard deviation of 43.35 marks. The mean score in the individual papers ranged from 4.77 to 5.21 on a scale of one to ten, the highest admissible score being one.

The average age of the candidates was 24.07 and the mode was 22. Coupled with this, the relevant standard deviation of 3.27 signifies a very low level of variability. This seems to be due to the fact that the sample comprised of only first-time candidates and thus the majority came from the younger age group. This is further confirmed by the data on the length of candidates' practical experience (EXP) and the period that elapsed after completing their formal education (OUT) at the time of attempting the UFE. The mean EXP and OUT were 1.60 and 1.58, which indicate that on the average candidates had less than one year's practical experience, and took the UFE within a year of their leaving school. A detailed explanation of the codes used for EXP, OUT and the highest university degree (HDEG) attained, candidates' age groups, and the number of candidates in each category is given in Table 3. Observe that over 73% of candidates had no practical experience in a chartered accountants' office and over 66% appeared in the UFE immediately after completing their required university education. This may be due to the fact that CA candidates in Quebec have the option to gain two years' practical experience in a chartered accountant's office either before or after taking the UFE. Roughly 98% of candidates held baccalaureate degrees in commerce with a major/specialized degree in accounting.

As indicated in Table 2, the grade point average of the candidates in general education (GPAG), business (GPAB) and accounting studies (GPAA) was in the low 70s (per cent marks). A higher standard deviation for GPAG (15.9) as compared with those for GPAB (5.5) and GPAA (8.6) indicates a relatively wider spread in grades earned by candidates in general education courses. The overall average in the degree program was 72.1, with a mode of 73.7, median of 72.6, and a standard deviation of 6.2. Thus the average candidate writing the UFE for the first time in Quebec in 1984 had a B- standing.

TABLE 2

Mean, Standard Deviation and Other Statistical Measures for Variables

	P I	P II	P III	P IV	TOTAL	AGE	EXP	OUT	GPAG	GPAB	GPAA	GPA-DEG	HRSG	HRSB	HRSA	HRS-DEG	FRG	FRB	FRA	FR-DEG
MEAN	5.21	4.99	4.77	5.20	242.7	24.07	1.60	1.58	73.6	73.5	70.4	72.1	9.5	42.4	39.6	91.5	.06	.47	1.08	1.71
MODE	2.00	1.00	1.00	1.00	240.0	22.00	1.00	1.00	75.0	75.0	75.7	73.7	6.0	45.0	39.0	90.0	0	0	0	0
MEDIAN	5.15	4.53	4.32	4.82	245.8	23.15	1.18	1.25	74.8	73.9	71.4	72.6	6.2	42.3	41.6	90.1	.07	.06	.35	.18
STD. ERROR	.11	.12	.11	.12	1.72	.13	.05	.04	.6	.2	.3	.2	.3	.3	.4	.2	.03	.07	.11	.16
STD. DEV.	2.87	2.95	2.89	3.02	43.35	3.27	1.25	1.07	15.9	5.5	8.6	6.2	8.1	8.8	9.5	4.6	.73	1.65	2.90	4.00

TABLE 3

Candidates' Age, Experience, Years Since Completion of Formal Education and the Highest Degree Attained

	AGE			EXP			OUT			HDEG		
Code	Category	Candidates		Category	Candidates		Category	Candidates		Category	Candidates	
	Years	Number	%	Months	Number	%	Years	Number	%	Under-Graduate	Number	%
1	20-25	519	82.0	0	465	73.5	0	423	66.8	Accounting Major	113	17.9
2	26-30	85	13.4	1-12	86	13.6	1	123	19.5	Specialized Degree-Acctng.	507	80.0
3	31-35	20	3.2	13-18	14	2.2	2	47	7.4	Non-accounting Business	10	1.6
4	36 & over	9	1.4	19-24	26	4.1	3	23	3.6	Non-business	3	0.5
5				25-36	24	3.8	4	8	1.3			
6				36 & over	18	2.8	5	5	0.8			
7							6	2	0.3			
8							7	2	0.3			
TOTAL		633	100.0		633	100.0		633	100.0		633	100.0

The average of credit hours devoted by the candidates to general education (HRSG) was 9.5, accounting for about 10 per cent of their total program. Both median and mode came roughly to six credit hours. The mean credit hours allotted to business courses, accounting studies and the aggregate degree program were 42.4, 39.6 and 91.5, respectively. Understandably enough, the total credit hours did not vary widely, as is evident from the mode of 90 hours and standard deviation of 4.61, since almost all the candidates had their undergraduate degrees from business schools in the Province of Quebec. The credit hours failed averaged the highest in accounting courses (1.08), followed by business studies (0.47), with a relatively high standard deviation of 2.90.

Table 4 provides averages of the examination scores and GPA in respect of those who passed the UFE; similar information relating to the failed candidates is also given. It is instructive to note how well GPA in the degree program seems to be related with success or failure in the UFE. GPADEG of candidates who passed ranged from 70.3 per cent to 80.1 per cent with an average of 74.3 per cent for all schools, while the overall average for those who failed was 68.5 per cent ranging from 62.8 to 72.1 per cent. This seems to indicate that the chances of a student with an average performance at the undergraduate level passing the UFE are quite low.

Curricular Choices

The accounting literature has been consistent throughout in maintaining that the end of professional accounting education is not merely the imparting of specialized knowledge of the field of accountancy (see, e.g., CICA, 1980). An appropriate accounting educational structure has been conceptualized "as a pyramid of three strata, the bottom and broadest one being the cultural one" (Turnburke, 1939). The other stratum is the collateral technical division, progressively focussing upon the last stratum, the direct specialized knowledge, the focal point of accountant's education. It is felt that in view of the advancing technology, and the increasing complexity of the economic environment and the scope of accountant's work, accountants need be broadly educated men and women (see, e.g., Kapoor and Chan, 1985).

Recommendations for a balanced accounting program have been made over the years by such organizations as the Ford Foundation (Gordon and Howell, 1959), the Carnegie Corporation of New York (Pierson, 1959), the American Accounting Association (AAA, 1968), the American Institute of Certified Public Accountants (AICPA, 1969), the Canadian Institute of Chartered Accountants (CICA, 1978), and the American Assembly of Collegiate Schools of Business (AACSB, 1983). It will be readily observed that these

TABLE 4

Average Score and Grade Point Average of First-Time Candidates Who Took the 1984 UFE in Quebec

"Pass" Candidates Range (of averages by school	P I	P II	P III	P IV	TOTAL	GPAG	GPAB	GPAA	GPA DEG
LOWEST	4.31	8.00	4.31	6.00	245.0	71.4	69.8	67.0	70.3
HIGHEST	2.00	1.33	2.00	1.60	319.4	85.0	79.9	81.0	80.1
AVERAGE	3.61	3.32	3.21	3.53	271.2	75.1	75.0	73.4	74.3

"Fail" Candidates Range (of averages by school)	PI	P II	P III	P IV	TOTAL	GPAG	GPAB	GPAA	GPA DEG
LOWEST	8.73	9.08	7.89	8.56	189.9	60.6	61.6	61.9	62.8
HIGHEST	2.00	6.51	5.00	4.33	232.0	77.0	75.0	69.2	72.1
AVERAGE	7.63	7.50	7.14	7.76	199.7	70.9	70.8	65.6	68.5

organizations, highly respected and active in North America in the field of business and accounting education, seem to advocate that roughly one-half of university undergraduate business/accounting program should be devoted to general education, i.e., to areas of study other than accounting and general business.

Table 5 reveals the choices made by the 1984 UFE candidates in Quebec in the selection of courses at the undergraduate and diploma (CA) levels in each subject area with a special reference to general education. An analysis of the individual university transcripts of students thus led to the construction of an "average" accounting curriculum actually followed by both the successful and unsuccessful UFE candidates in Quebec. Observe that, regrettable as it is, of those who passed the UFE, only 4.3% had chosen to take a course in the natural sciences and philosophy or logic, 8.6% in the English language and literature, 9.4% in history or political science, 10.6% in the French language and literature, 21.8% in psychology/sociology and so on. The overall actual distribution of student time to general education, general business and accounting at the undergraduate level was around 10%, 46% and 44%, respectively.

Interestingly enough, no significant difference was found in the quantum and selection of course work undertaken by the "Pass" and "Fail" candidates. Overall, the former happened to have completed two more credit hours of work (including diploma/additional course work) than the latter, out of which about one-half credit hour was in general education. Admittedly, this is insignificant. However, the analysis does indicate that the student time devoted to general education in business schools in Quebec is much below the recommendations of various studies on the subject.

Summary and Conclusion

The analysis of the backgrounds of 633 UFE Candidates reveals that the overall quality of candidates appearing in the examination leaves much to be desired. The average candidate writing the UFE for the first time in Quebec in 1984 had a B- standing. This could be one of the causes of a high failure rate in the UFE. It is, therefore, imperative to adopt a policy of careful elimination of poor quality candidates. Students who are not fitted by capacity, as indicated by the low grade point averages, or temperament should be counselled to find their niche elsewhere. A well-designed policy of careful selection and vocational guidance will be invaluable in avoiding a waste of time, money and eventual frustration to students as well as educators.

TABLE 5

Average Credit Hours Actually Completed by the UFE Candidates (1984) in Quebec in the Various Subject Areas

Subject/Areas	PASS						FAIL					
	Candidates who actually took the undergraduate course(s) out of a total of 395.		Average Credit Hours				Candidates who actually took the undergraduate course(s) out of a total of 238.		Average Credit Hours			
	Number	%	Under-graduate	Diploma/ Additional	Total	% G. Total	Number	%	Under-graduate	Diploma/ Additional	Total	% G. Total
1. English Language & Lit.	34	8.6	.40	-	.40	.4	25	10.5	.50	.03	.53	.5
2. French Language & Lit.	42	10.6	.61	.02	.63	.6	25	10.5	.54	.03	.57	.6
3. Humanities - Other	54	13.7	.65	.05	.70	.7	30	12.6	.60	.01	.61	.6
4. Philosophy, logic	17	4.3	.14	-	.14	.1	6	2.5	.10	-	.10	.1
5. Psychology, Sociology	86	21.8	1.00	-	1.00	1.0	56	23.5	.91	-	.91	.9
6. History, Political Science	37	9.4	.45	.01	.46	.5	16	6.7	.25	-	.25	.3
7. Natural Sciences	17	4.3	.31	-	.31	.3	4	1.7	.11	.22	.33	.4
8. Mathematics	117	29.6	1.18	.07	1.25	1.2	61	25.6	.87	-	.87	.9
9. Statistics	383	97.0	4.69	.02	4.71	4.7	233	97.9	4.94	.01	4.95	5.0
10. Others	32	8.1	.27	-	.27	.3	18	7.6	.29	.03	.32	.3
TOTAL GENERAL EDUCATION	-	-	9.70	.17	9.87	9.8	-	-	9.11	.33	9.44	9.6
TOTAL GENERAL BUSINESS	-	-	42.55	.91	43.46	43.3	-	-	42.21	.77	42.98	43.6
TOTAL ACCOUNTING	-	-	39.45	7.68	47.13	46.9	-	-	39.79	6.30	46.09	46.8
GRAND TOTAL	-	-	91.70	8.76	100.46	100.0	-	-	91.11	7.40	98.51	100.0

It is unfortunate that an adequate breadth component is lacking in undergraduate accounting programs offered by most universities in the Province of Quebec. The aim of professional accounting education should not merely be the transmission of the specialized accounting and business knowledge, but also the imparting of cognitive skills and a broad-based general education, which the aspiring professional needs most to adapt to and to resolve complex situations in a changing environment.

References

American Accounting Association, "A Restatement of Matters Relating to Educational Policy," The Accounting Review, XLIII Supp. (1968), pp. 56-123.

American Assembly of Collegiate Schools of Business, Accreditation Standards and Guidelines for Business Administration Programs (American Assembly of Collegiate Schools of Business: St. Louis, Missouri 1983).

American Institute of Certified Public Accountants, Report of the Committee on Education and Experience Requirements for CPAs (American Institute of Certified Public Accountants: New York 1969).

Canadian Institute of Chartered Accountants, "The Report of the Special Committee to Examine the Role of the Auditor," CA Magazine (April 1978), pp. 36-69.

Canadian Institute of Chartered Accountants 1979 Symposium Commitee, CICA Symposium on Education and the Professional Accountant, November 1979: Summary of Proceedings (Canadian Institute of Chartered Accountants: Toronto 1980), p. 3.

Canadian Institute of Chartered Accountants, The Board of Examiners' Report on the 1984 Uniform Final Examination (The Canadian Institute of Chartered Acountants: Toronto 1985), pp. 9 and 13.

Gordon, R. A. and James E. Howell, Higher Education for Business (Columbia University Press: New York City 1959).

Kapoor, M. R. and K. Hung Chan, "Education of the Professional Accountant: An Empirical Study," The Canadian Journal of Higher Education (XV-2, 1985), pp. 53-73.

Pierson, F.C., et al., The Education of American Businessmen (McGraw Hill Book Company: New York 1959).

Rosen, L. S., "Accounting Education: A Grim Report Card," CA Magazine (June 1978), pp. 30-35.

_____, "Restoring the Importance of Accounting Education," CA Magazine (September 1982), pp. 33-34.

Turnburke, H. M., "Accountancy: A Profession for Educated Men", The Accounting Review, XIV, No. 3 (September 1939), pp. 250-258.

CAAA 1988 Conference
University of Windsor
Windsor, Ontario

Farhad Simyar
Bruce La Rochelle
Faculty of Commerce and
Administration
Concordia University

POWER AND AUTHORITY RELATIONSHIPS: IMPLICATIONS FOR STANDARD SETTING IN THE CANADIAN PUBLIC SECTOR

In recent years, the Public Sector Accounting and Auditing Committee of the Canadian Institute of Chartered Accountants has issued several pronouncements, "render(ing) on its own authority such pronouncements as it considers in the best interest of the community as a whole" (Introduction to Public Sector Accounting and Auditing Recommendations, 1986). The purpose of this paper is to examine the role of this Committee and its potential for influencing accounting standards in the public sector. Power and authority relationships are canvassed, with emphasis on the conceptual framework developments in the private sector and the implications for comparable developments in the public sector. In addition, public sector developments in the United States are compared with those of Canada.

Introduction

In 1981, the Public Sector Accounting and Auditing Committee was established by the Canadian Institute of Chartered Accountants. The mandate of this committee was twofold: (1) to consider matters of public sector accounting and auditing theory and practice and to render on its own authority such pronouncements as it considers in the best interest of the community as a whole and (2) to provide for the growth of Canadian accounting and auditing literature for the public sector by encouraging specialized studies.[1] Since its establishment, the Committee has issued three principal statements relating to accounting. In addition, the Committee has recently (1987) issued jointly with the Canadian Institute of Actuaries a special report, Accounting for Pension Obligations and is currently involved with a project to determine the nature of the government reporting entity. The purpose of this paper is to examine these statements and the role of the Committee in light of recent discussions concerning power and authority relationships in the establishment of accounting standards.

Authority and Power Relationships: Implications for a Conceptual Framework

In recent years, there has been an increased concern as to how financial accounting standards may be justified to the constituencies affected by such standards. To this end, the conceptual framework project was completed in the United States, meeting with decidedly mixed reactions: (see, for example, Anthony, 1987; Solomons, 1986; Miller, 1985.) Apart from disputes as to the nature of a conceptual framework - for example, is it a constitution

[1] Introduction to Public Sector Accounting and Auditing Recommendations (Revised 1986), para. .01.

(Solomons, 1986, Amernic and Lemon, 1985) or a more generalized document intended to "raise the moral tone" of accounting (Peasnell, 1982) - there were reservations as to the overall utility of a framework. In Canada, the U.S. project was criticised as being too normative and viewed as being a product of a pugilistic historical and litigious social context found in the United States (Stamp, 1980). Curiously, it is in the pronouncements of the Public Sector Accounting and Auditing Standards Committee that one finds aspects of a formalized conceptual framework in Canada. Beyond a Research Study (Stamp, 1980) and some academic commentary thereon (e.g. Denman, 1981, Amernic and Lemon, 1984, Denham, 1985), there was, until quite recently, no attempt to establish a conceptual framework for financial accounting in Canada. It would appear that cost/benefit considerations were, at least initially, more of a concern in Canada than in the United States (see, for example, Park, 1981). A Canadian attitude of "nice but not necessary" is exemplified by commentary in the Report of the Special Committee on Standard Setting (1981), expressing a preference for "practicality", from the perspective of users, in the case of conflict with conceptual purity.[2]

Notwithstanding such statements, the Accounting Standards Authority of Canada, a body sponsored primarily by the Canadian Certified General Accountants Association, has recently (1986) published a Conceptual Framework for Financial Reporting. One may question the utility of the formulation of a conceptual framework by an association which has no government mandate to set accounting standards, let alone to provide conceptual justifications for the standards already in existence. However, the position of the Public Sector Accounting and Auditing Standards Committee is not substantially different, as will be demonstrated.

It is to be noted that in the release of a conceptual framework document by the CICA is imminent, according to information received by the writer from representatives of the CICA. The document is not yet available for general review or discussion.

Exhibit 1 is a model demonstrating that the utility of a conceptual framework is dependent upon the power and authority relationship between the accounting standard-setting body and its constituents. It is adapted from Peasnell (1982). Peasnell contended that the extent to which standard-setting authority had been delegated determined the extent to which a conceptual justification for accounting standards was required. He examined three possibilities for delegated authority: (1) the standard-setting body may be delegated the responsibility for regulation, with the power of enforcement being retained by the delegator; (2) the responsibility for the establishment of accounting standards rests with the delegator, while the power of enforcement is delegated to an accounting body and (3) responsibility for the establishment of accounting principles and the power of enforcement (both in fact and in law) is delegated to the standard-setting body.

Peasnell contended that the establishment of a conceptual framework by a standard-setting body could only be justified in circumstances where both the

---

[2] Recommendation 6 of the Report of the Special Committee on Standard Setting, as found in "SCOSS Highlights", CA Magazine, June, 1981, pp. 35-49 at p. 37. This sentiment exemplifies the historical trend to develop accounting standards on an inductive rather than a deductive basis.

responsibility for regulation and the power of enforcement were both delegated. In such circumstances, a conceptual framework provides a justification for the confidence expressed by the delegating body in delegating the authority (Peasnell, 1982; Amernic and Lemon, 1985). On the other hand, if only the responsibility for regulation is delegated, a conceptual framework becomes irrelevant, since it is the delegating authority which determines the accounting principles to which it will require adherence. The standard-setting body may be ignored. If neither the responsibility for regulation nor the power of enforcement are delegated, a conceptual framework is viewed as a hindrance, since the acceptance of the accounting principles established by the standard- setting body becomes a bargained acceptance. The likelihood of acceptance may be looked at from the perspective of conflict resolution; in circumstances where choices are limited, the conflict is less likely to be resolved. On this reasoning, a conceptual framework hinders resolution or acceptance by limiting choices.

Peasnell cited the Canadian accounting standard-setting environment as the environment where both the responsibility for regulation and the power of enforcement were both delegated. He based this on the fact that the Canada Business Corporations Act requires that financial statements filed under that act be in accordance with the recommendations of the CICA Handbook.[3] Peasnell contrasted this situation with that existing in the United States, where he felt that accounting standard-setting was overshadowed by the power of enforcement vested in the Securities and Exchange Commission. The Securities and Exchange Commission was an agent of government; as such, it had demonstrated a willingness to effectively overrule the FASB in such areas as foreign currency translation and, with respect to the extractive industries, full cost vs. successful efforts accounting. In such circumstances, a conceptual framework is considered to be irrelevant, since dissatisfied users may appeal to the enforcement authority for assurance that a particular standard will not be enforced. However, recent Canadian developments, discussed post, would appear to cast doubt on Peasnell's portrayal of the CICA as possessing regulatory and enforcement powers.

The Position of the Public Sector Accounting and Auditing Standards Committee

As noted ante, the Public Sector Accounting and Auditing Standards Committee was established and its mandate granted by the Canadian Institute of Chartered Accountants. The committee views its pronouncements as being applicable to "federal, provincial, territorial and local governments and government entities, such as government funds, agencies, and corporations".[4] However, none of the entities to which the pronouncements are directed are in any way compelled to follow the recommendations. The accounting principles of federal and provincial governments are as established by those governments. Local government accounting, where there are prescriptions, is as prescribed

---

[3] See Canada Business Corporations Act Regulations, PC 1979-1175, as amended, s. 44. "Unless otherwise provided in the regulations, the financial statements are to be prepared in accordance with the standards, as they exist from time to time, of the Canadian Institute of Chartered Accountants set out in the C.I.C.A. Handbook."

[4] Public Sector Accounting and Auditing Committee, "Introduction to Public Sector Accounting and Auditing Recommendations" (1986), para. .03.

by provincial governments. The term "government entities" is difficult to understand, since many such entities are not entities which report separately from the government. If they do report separately, most frequently it is because they are self-sustaining crown corporations, in which case the GAAP followed is that of any other commercial entity. Based on the foregoing, it may be seen that the Public Sector Accounting and Auditing Standards Committee possesses neither the responsibility for regulation nor the power of enforcement. Therefore, any conceptual framework established could be viewed as a positive hindrance to the acceptance of any standards set. Paradoxically, one of the first pronouncements of the Committee was in the nature of a conceptual framework.

A Review of the Pronouncements

Reviewing the pronouncements of the Committee, one's first question is with respect to the ordering of the content of the statements. Statement 1 "Disclosure of Accounting Policies" (1984), concerns certain aspects of note disclosure. Statement 2, "Objectives of Government Financial Statements" is the conceptual document. Statement 3 (1986) "General Standards of Financial Presentation for Governments" would appear from its title to be of a comparable nature to Part 1 of the accounting recommendations of the CICA Handbook. However, unlike the segregation found in the Handbook of provisions dealing with specific items from more general provisions, Statement 3 is a mix of pronouncements relating to both general and specific items.

With respect to Statement 2, Exhibit 2 highlights the significant differences between this statement and the comparable pronouncement of the U.S. Government Accounting Standards Board (GASB). A significant distinction is that the Committee's statement is included in the same series of statements as those dealing with specific pronouncements. When formulating its conceptual framework, the GASB was careful to distinguish conceptual underpinnings from specific pronouncements. Statements dealing with specific government accounting matters are designated as Statements of Government Accounting Standards, while the one conceptual statement to date is clearly separated (Concepts Statement #1). A similar segregation is found in the pronouncements of the Financial Accounting Standards Board, which segregates its conceptual framework project on Statements of Financial Accounting Concepts, as opposed to Statements of Financial Accounting Standards. In addition, both the GASB and the FASB recognized that conceptual considerations related to financial information generally, rather than being limited to financial statements. There is no such recognition in Statement 2. Indeed, Statement 2 is quite limited in application, applying only to the summary financial statements published by a govenrment, as opposed to, for example, the statements issued by entities which are consolidated with those of government. Special purpose financial statements and other financial reports published by the government are specifically excluded from the application of the conceptual statement.[5] In addition, while the pronouncements of the committee were to apply to the "public sector" generally, defined to include government funds, agencies and corporations, such entities have been implicitly excluded from the application of the conceptual statement. It is difficult to understand why conceptual considerations would not apply to all constituencies to which the Committee's pronouncements were intended to be addressed.

---

5 See PSAAC, Statement 2, "Objectives of Government Financial Statements", paras. .02, .03.

It is fundamental to the development of any conceptual framework that user needs be assessed and that the conceptual framework be framed by those needs. A major reason for this approach is that a conceptual framework is to assist in moving accounting from an inductive to a deductive basis. To effect such a movement, however, the formulators of a conceptual framework must either impose their original premises (much like a "ten commandments of accounting") or provide a justification for first principles by inducing user needs. (Skinner, 1987). This was the approach adopted by the CICA study groups in the Research Studies Financial Reporting by Governments (1980) and Local Government Financial Reporting (1985). This approach appears to have caused some confusion on the part of the Committee; Statement 2 evidences a "cart before the horse" approach, since user needs are not assessed independently of specific pronouncements.

Statement 2 groups the users into four classes; the public, legislators, investors and analysts, with the legislators being specified to be the primary user class. However, this logic underscores the futility of a conceptual framework. If the legislators set their own accounting standards and are also the primary users of the financial statements, the utility of the financial statements is assessed relative to the accounting standards the legislators have established to satisfy their needs, rather than against a conceptual pronouncement which they did not authorize.

The foregoing concerns are in part addressed by examining the comparable power and authority relationships of the U.S. Government Accounting Standards Board. The GASB was established in 1984 to replace the National Council on Government Accounting, an organization which encountered the same independence problems as the pre-FASB Accounting Principles Board. The GASB was created as a sister organization to the FASB, with similar financing through the Financial Accounting Foundation. Like the FASB, the GASB follows the principles of due process, including public hearings (Ives, 1985).[6]

The GASB's mandate is to promulgate standards for state and local governments. Unlike the PSAAC, it does not purport to establish accounting standards for the U.S. Federal Government. It was formed in part due to the mid-1970's fiscal crises in New York and Cleveland, when Congress expressed concern that no uniform accounting standards existed for state and local governments. Congress proposed to use the Securities and Exchange Commission and the General Accounting Office (similar to the office of the Comptroller General in the Canadian Federal Government) to establish a standard-setting body.[7] While the GASB cannot legally compel state and local governments to follow its pronouncements, the AICPA Auditing Standards Board recently ranked GASB standards above FASB standards for state and local governments. In addition, in May of 1986, the AICPA council adopted a resolution specifying the GASB as the designated body to establish accounting principles for state and local governments enforceable under Rule 203 of the AICPA Code of Professional Ethics. By so doing the AICPA has compelled its members to follow GASB pronouncements unless a CPA believes that following a particular pronouncement in a given set of circumstances would produce misleading results. Thus, the threat of a qualified audit report plus required compliance with GASB standards by CPA preparers act as enforcement mechanisms of GASB standards. In addition, the charters of many states and municipalities

---

[6] Martin Ives is the Vice-Chairman and Director of Research of the GASB.
[7] See "A Bid to Bring Order to State and Local Books". Business Week, June 25, 1984, pp. 129-130.

require their governments to follow GAAP in the preparation of their financial statements; the GASB is endeavouring to have compliance with its pronouncements incorporated in such legislative pronouncements. Similarly, in circumstances where federal regulations require state and local governments to use GAAP when reporting on federal grants and programs, the GASB is endeavouring to have GAAP referenced to GASB pronouncements (Ives, 1985). As a final matter, there is evidence that adopting standard reporting methods in the public sector, such as those promulgated by the GASB, reduce costs to public officials that arise from politicization (Baber and Sen, 1984). Therefore, standard reporting methods should be welcomed by legislators.

Implications for Public Sector Accounting Standard Setting in Canada

From the foregoing, the following issues arise for further consideration.

1. It is not evident that the PSAAC has done otherwise than make accounting pronouncements in a vacuum. Unlike the GASB, the supremacy of the Federal Government and the questionable utility of setting Federal Government accounting standards does not appear to be recognized. To what extent has any government recognized the PSAAC as an influential authority or agreed to be bound by its pronouncements?

2. Based on (1) and on the Peasnell model, the promulgation of a conceptual framework document makes little sense, since such a document lessens the likelihood of a bargained acceptance of other standards.

3. The PSAAC was established in 1981, whereas the GASB was established three years later. In half the time, there has been a far greater lobbying effort by the GASB to compel compliance with its provisions by way of incorporation in rules of professional conduct and, where possible, by way of legislative incorporation. Admittedly, accounting standard setting in Canada, in both the public and private sectors, is at a pre-GASB and pre-FASB standard, since standards are established by non-independent volunteers. However, one would expect to see some degree of bargained acceptance, given that the PSAAC has been in operation for six years and issued its first pronouncement in 1984.

The foregoing is not intended to suggest that the work of the PSAAC is totally without merit. The intention is simply to raise questions for discussion concerning the effectiveness of its operation, in the interest of a more precise focus being brought to its work and increased acceptance of its work by users.

References

Accounting Standards Authority of Canada. Conceptual Framework for Financial Reporting, Vancouver, 1987.

Amernic, J. and W. Lemon. "Do We Need a Canadian Conceptual Framework?" CA Magazine, July, 1984, pp. 22-27.

Anthony, R. "We Don't Have the Accounting Concepts We Need". Harvard Business Review, January-February, 1987, pp. 75-83.

Baker, W.R. and P.K. Sen. "The Role of Generally Accepted Reporting Methods in the Public Sector: An Empirical Test". Journal of Accounting and Public Policy, Summer, 1984, pp. 91-106.

Denham, R. "Standard Setting Under Pressure". CA Magazine, May, 1985, pp. 36-45.

Denman, J. "Corporate Reporting and the Conceptual Framework Issue". CA Magazine, April, 1981, pp. 74-78.

Governmental Accounting Standards Board. Concepts Statement No. 1 - Objectives of Financial Reporting, Stamford, 1987.

Hayward, C.W. (Chairman). Local Government Financial Reporting. Toronto; The Canadian Institute of Chartered Accountants, 1985.

Ives, Martin. "GASB: A Fresh Look at Governmental Accounting and Financial Reporting". Journal of Accounting, Auditing and Finance, Summer, 1985, pp. 253-268.

Miller, P. "The Conceptual Framework: Myths and Realities". Journal of Accountancy, March, 1985, pp. 62-71.

Park, R.W. "Is Corporate Reporting Asking Too Much?" CA Magazine, December, 1981, pp. 34-37.

Peasnell, K.V. "The Function of a Conceptual Framework for Corporate Financial Reporting". Accounting and Business Research, Autumn, 1982, pp. 243-256.

Public Sector Accounting and Auditing Committee. Introduction to Public Sector Accounting and Auditing Recommendations. Toronto; Revised, 1986.

_____. Statement 1, Disclosure of Accounting Policies. Toronto, 1983.

_____. Statement 2, Objectives of Government Financial Statements. Toronto, 1984.

_____. Statement 3, General Standards of Financial Statement Presentation for Governments. Toronto, 1986.

Ross, N. Glen (Chairman), Financial Reporting by Governments. Toronto: Canadian Institute of Chartered Accountants, 1980.

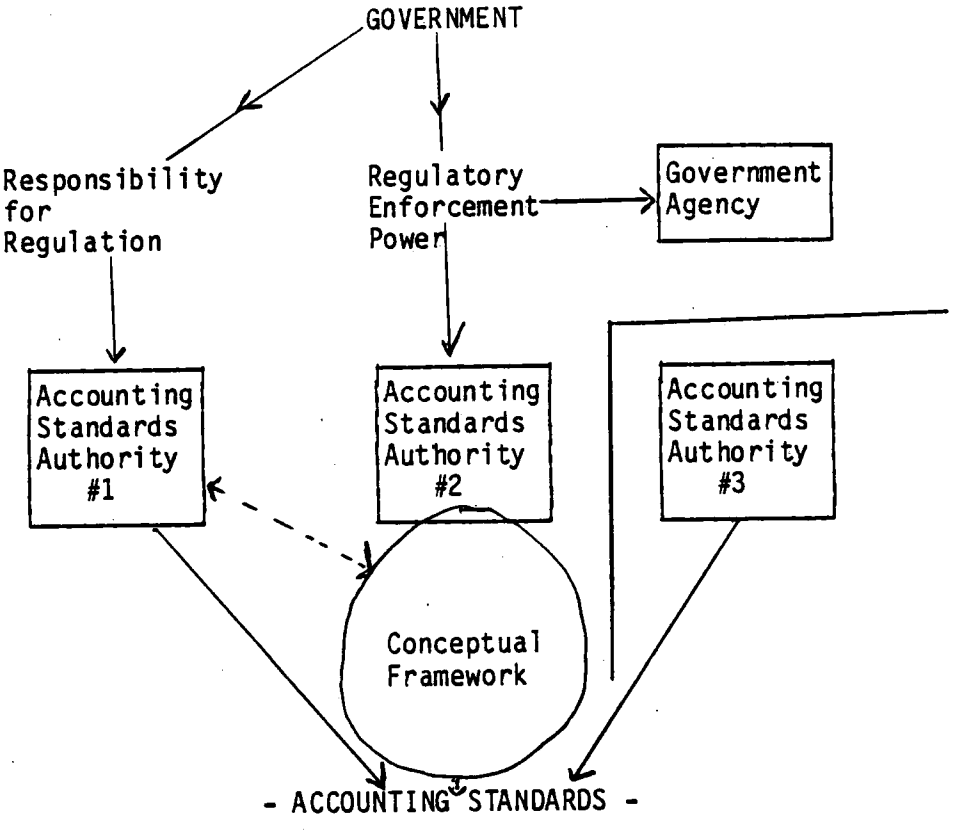
Skinner, R. Accounting Standards in Evolution. Toronto; Holt, Rinehart and Winston of Canada, 1987.

Solomons, D. "The FASB Conceptual Framework: An Evaluation". Journal of Accountancy, June, 1986, pp. 114-124.

Stamp, E. Corporate Reporting: Its Future Evolution. Toronto; The Canadian Institute of Chartered Accountants, 1980.

Exhibit 1

A Regulatory Model for Accounting Standard Setting



#1 - Conceptual Framework Irrelevant

#3 - Conceptual Framework a Hindrance

Exhibit 2
Selected Comparisons of Conceptual
Pronouncements: PSAAC - GASB

Subject	PSAAC Statement 2	GASB Concepts Statement 1
Application of Statement	The summary financial statements published by a government that reports on its financial condition and results of operations. "Government" is defined to mean "the elected and approved policymakers and administrators who together perform the executive function and are preparers of the financial statements". (para. .02)	The general purpose external financial reporting by state and local government entities. (paras. 1,8)
Users of financial statements/financial information	The public, legislators,investors and analysts; the primary users are legislators. (para. .11)	The citizenry, legislative and oversight bodies, investors and creditors (para 30). No primary user specified. Internal managers included as non-primary users.
User needs	The allocation and use of financial resources; The sources and types of government revenues; The extent to which revenues were sufficient to meet expenditures; How the government financed its activities and how it met its cash requirements: The government's financial conditions; Actual results of financial activities in comparison with those originally forecast and the use of past periods; That public financial resources were managed in accordance with legislative authorities.(para. .14)	Used in making economic, social and political decisions primarily by (a) Comparing actual financial results with the legally adopted budget; (b) Assessing financial conditions and results of operations; (c) Assist in determining finance-related laws, rules and regulations;(d) Assisting in evaluating efficiency and effectiveness (para. 32)

Subject	PSAAC Statement 2	GASB Concepts Statement 1
Application of pronouncement to business-type activities of government	Not specifically applicable since statement applies to government summary financial statements only. Howeverthe summary financial statements should provide an accounting of the full nature and extent of the financial affairs and resources for which the government is responsible including those related to the activities of government agencies and enterprises (para. .29)	Statement is generally applicable to business-type activities of government; the uses of financial reports of business-type activities generally differ only in emphasis from the uses of financial reports of government-type activities. (para. 53)
Objective of financial information: account-ability	(1) Financial statements should provide information useful in evaluating the government's performance in the management of financial affairs and resources. (2) Financial statements should provide information useful in assessing whether finan-cial resources were administered by the government in accordance with the limits established by the appropriate legislative authorities. (para. .34)	At a minimum, demonstrating accountability includes providing information to assist in evaluating whether the government was operated within the legal constraints imposed by the citizenry. (para. 58)

LE DEVELOPPEMENT DES SYSTEMES D'INFORMATION ET LA PARTICIPATION DES VERIFICATEURS

Présenté au Congrès annuel de
l'Association Canadienne des Professeurs de Comptabilité
University of Windsor, Windsor, Ontario
1-2 juin 1988

par:

Andrée Lafortune, M.B.A.(syst. d'info.), C.A.
Professeure adjointe
Ecole des Hautes Etudes Commerciales
Montréal

L'auteure tient à exprimer sa gratitude pour le support financier accordé par la Direction de la recherche de l'Ecole des Hautes Etudes Commerciales.

LE DEVELOPPEMENT DES SYSTEMES D'INFORMATION ET LA PARTICIPATION DES VERIFICATEURS

Introduction

Au cours des deux dernières décennies, la gestion organisationnelle s'est sensiblement modifiée sous l'impact des nouvelles technologies et principalement des ordinateurs. Le passage des systèmes d'information manuels aux systèmes d'information informatisés affectent les informations et leur circulation, les tâches organisationnelles à tous les niveaux et les gestionnaires. Il est donc peu surprenant que certains emploient le terme de "révolution informatique".

Pour s'assurer qu'elle s'avère bénéfique pour l'organisation, la technologie doit cependant demeurer sous le contrôle de la direction. Les dirigeants ont pour responsabilités d'assurer la protection des ressources informatiques, d'en favoriser un développement adéquat selon les besoins des usagers et de l'organisation, et de veiller à ce que les contrôles de prévention, de détection et de correction soient mis en place. Une grande partie de ces responsabilités peut être acquittée par une supervision appropriée du processus de développement des systèmes d'information. Ce processus comprend trois grandes étapes, soit celle de définition du système, celle du développement et celle de l'installation et de l'opération du système. Pour faire face aux risques associés à ce processus, le gestionnaire se doit de prendre action en choisissant diverses stratégies pertinentes à la situation. Tel que nous l'indiquent Alter et Ginzberg (1978),

> "More important than the particular details is the basic idea that one should assess the risk factors present in any system development situation, and then try to develop implementation strategies which will minimize the danger posed by these risks. "(p.30).

Parmi ces stratégies, certains tels Campfield (1983), Fitzgerald (1976), Helms (1983), Helms (1984), Holley et Cash (1981), Miller (1980), Rittenberg et Purdy (1978), Tashji (1981), Weiss (1980), Wysong (1983), le Comité sur les stratégies à long terme de l'Institut Canadien des Comptables Agréés (1986) et l'"Institut of Internal Auditors" (1977)) proposent la participation de vérificateurs dans l'équipe chargée du développement d'un système d'information.

La tâche des vérificateurs, qu'ils soient internes ou externes, se ressent de l'informatisation des organisations. Les données, les processus qu'ils vérifient, sont maintenant exécutés par un système intégré humain-machine. Il ne leur est donc plus possible de ne porter attention qu'aux agissements humains puisque la nature même du travail administratif s'en est trouvé modifiée. Ce nouveau contexte organisationnel exige des vérificateurs qu'ils emploient des techniques de vérification mieux adaptées à la technologie informatique. Les questionnaires touchant les traitements informatisés doivent céder la place à une vérification "autour" de l'or-

dinateur, puis à une vérification "à travers" l'ordinateur et à l'aide de jeux d'essais. Cependant, ces façons de procéder ne permettent pas une compréhension véritable du système, ni une vérification adéquate des contrôles. Souvent, les recommandations émises à posteriori par les vérificateurs ne peuvent être implantées dans le système élaboré. Les auteurs nommés plus haut réclament donc la participation des vérificateurs au développement de systèmes d'information de façon à ce qu'ils puissent veiller à ce que les contrôles requis soient en accord avec les politiques de l'organisation, que les sytèmes modélisés répondent aux besoins des usagers et enfin qu'une vérification authentique du système soit possible. Tel est d'ailleurs l'avis de Mark A. Folk (1980): "It is necessary for the auditor to play a critical role in a system's development if he is to audit that system on an effective basis" (p.19).

A cette argumentation s'oppose le concept d'indépendance du vérificateur. Le vérificateur externe peut-il accepter des missions multiples pour une même organisation, telles la participation au développement d'un système d'information et la vérification des états financiers, sans se retrouver dans une situation de conflit d'intérêts? L'offre de conseils pour le développement de systèmes d'information s'avère-t-elle différente des services de fiscalité ou de recrutement offerts par les firmes d'experts-comptables? Le vérificateur interne peut-il effectuer une vérification d'un système d'information sans que son jugement ne soit entaché par sa participation au développement de ce système? Qu'en est-il de la compétence des vérificateurs dans ce domaine? Possèdent-ils les connaissances et l'expertise nécessaires pour que leur apport soit significatif et rentable?

Objectif et motivation pour la recherche

L'objectif de cette recherche n'est pas de répondre à toutes ces questions, ni de décider de la pertinence d'une participation du vérificateur au développement de systèmes informatisés. La littérature nous présente la problématique sous de multiples facettes. Les gestionnaires sont inquiets face au phénomène d'informatisation de leur entreprise, phénomème dont ils se sentent souvent spectateurs. L'une de leurs préoccupations premières est que cette informatisation n'augmente les risques et les éventualités de perte pour l'organisation, que ce soit lors du développement du système ou lors de son utilisation. Le système doit donc être contrôlé et doit comporter des contrôles. Tel que l'indiquent Dascher et Harmon (1984), il semble plus efficace et moins coûteux de concevoir ces divers contrôles en même temps que le système plutôt qu'après son implantation. De ce raisonnement découle la participation de vérificateurs au développement de systèmes puisqu'ils assument souvent le rôle d'experts en contrôle pour les organisations. Cependant, tant pour le vérificateur interne que pour le vérificateur externe se posent les problèmes de compétence en systèmes informatisés et d'indépendance.

Que pensent les dirigeants d'entreprise de la participation des vérificateurs au développement de systèmes d'information? Il nous paraît important de connaître leur opinion puisque ce sont eux qui décident des

priorités de l'organisation selon leurs objectifs et préoccupations et qui approuveront ou non la participation de vérificateurs. Leur opinion est-elle influencée s'il s'agit d'un système d'information comptable ou d'un système d'information de gestion? Traditionnellement, le vérificateur est assez étroitement associé aux informations de nature comptable. Noreen Foh (1983) conçoit d'ailleurs dans ce cadre la participation du vérificateur au développement de systèmes. Cependant, l'aspect contrôle demeure important pour les systèmes d'information de gestion; d'ailleurs, le Comité sur les stratégies à long terme de l'ICCA (1986) associe le comptable agréé à la conception et à la mise en place de systèmes de comptabilité générale et de systèmes d'information de gestion.

De caractère exploratoire, cette recherche vise donc à connaître quelles sont les opinions des gestionnaires de haut niveau quant à la participation de vérificateurs, tant internes qu'externes, au développement de systèmes d'information. Cet objectif nous semble important vu les nombreuses et assez favorables publications sur le sujet: quels que soient les avantages et inconvénients entrevus par la littérature, il revient au gestionnaire de choisir parmi différentes stratégies pour contrer les risques associés au développement des systèmes d'information.

Modèle et hypothèses

Selon sa perception des besoins de l'organisation, des habiletés de chacun et son analyse coûts-bénéfices, le gestionnaire pourra envisager de faire participer au développement de systèmes un vérificateur interne, préférer la participation d'un vérificateur externe ou, sensible au problème de l'indépendance, retenir les services d'un vérificateur autre que celui chargé de la vérification des livres de l'entreprise. Nous examinerons les intentions des gestionnaires quant à cette participation en fonction des risques que la littérature associe au développement d'un système d'information. La figure 1 présente le modèle élaboré.

Par l'expression "système d'information comptable", nous faisons référence à un système intégré humain-machine qui enregistre des données comptables et financières et dont le but premier est l'établissement d'états financiers. L'expression "système d'information de gestion" réfère, elle, à un système intégré humain-machine qui a pour but de fournir en temps voulu des informations fiables et nécessaires à l'exploitation ou à la gestion d'une entreprise et à la prise de décisions administratives.

Pour ce qui est de la notion de risque, la définition qu'en donnent Haeckel et Johnson (1983) nous semble intéressante: "Risk is perhaps the most difficult term to define. Dictionary definitions tell us that risk has some element of probability and is usually indesirable. When applied to information security, it is best to consider risk as an interaction of cause and consequence" (p.38). Tout risque est évalué de façon subjective par le gestionnaire. Selon cette évaluation, ce dernier décidera s'il doit ou non prendre action pour réduire ce risque. La décision de faire participer ou non un vérificateur au développement d'un système d'information procédera ainsi de cette évaluation. Le modèle inclut donc la va-

riable dichotomique "importance du risque". La participation d'un vérificateur au développement d'un système d'information est ici entendue comme son implication plus ou moins grande dans une ou plusieurs des étapes du cycle de vie d'un système d'information.

Le modèle permet de formuler les hypothèses générales suivantes:

H1: Selon que le système développé soit un système d'information comptable ou un système d'information de gestion, les dirigeants d'entreprises prôneront une participation différente des vérificateurs au développement de systèmes.

H2: Selon que la fonction des gestionnaires soit reliée à la comptabilité, à l'informatique ou à l'administration générale, ceux-ci prôneront une participation différente des vérificateurs au développement de systèmes.

H3: Selon que l'entreprise à laquelle sont rattachés les gestionnaires soit une PME ou une grande entreprise, ceux-ci prôneront une participation différente des vérificateurs au développement de systèmes.

Méthodologie et cueillette des données

Le questionnaire qui fut élaboré présente divers risques que la littérature associe au développement de systèmes d'information. Afin d'exercer un certain contrôle sur la variable exogène "connaissance du domaine", il nous a semblé important de fournir les définitions de quelques expressions employées tout au long du questionnaire, telles "système d'information comptable", "système d'information de gestion", "développement d'un système d'information", "vérificateur externe" et "vérificateur interne". Selon le modèle de recherche élaboré précédemment, le gestionnaire doit répondre à la question suivante:

> Les situations qui suivent RISQUENT de se produire lors du développement d'un système d'information ou de résulter de ce développement. Pour chaque cas, indiquez si vous feriez participer ou non des vérificateurs dans l'équipe de développement et si oui, LE ou LESQUELS?

Cette question est suivie de l'énumération de vingt risques dont le schéma de réponse est identique pour chacun: le risque est-il important, la participation suggérée s'il s'agit d'un système d'information comptable et celle suggérée s'il s'agit d'un système d'information de gestion (voir figure 2). Les divers risques présentés ont ressorti lors de la revue de la littérature. Ils ont bien sûr un lien étroit avec les tâches du vérificateur et les bénéfices découlant de sa participation au développement de systèmes d'information.

1. Une documentation incomplète ou inadéquate du processus de développement et du système (FitzGerald (1978), Foh (1983), Haeckel et Johnson (1983), Hannye (1977), Helms et Weiss (1983), Rittenberg et Davis (1977)).

2. La mise en place d'un système ne correspondant pas à la structure organisationnelle de l'entreprise (Pliniussen (1983), Perry et FitzGerald (1977)).

3. Les coûts d'exploitation dépassent largement les prévisions (Alter et Ginzberg (1978), Farmer (1983), FitzGerald (1978), Foh (1983), Haeckel et Johnson (1983), Helms (1983) Helms (1984), Holley et Cash (1981), McFarlan (1981), Merten et Severance (1981), Rittenberg et Purdy (1978), Wysong (1983)).

4. Les délais de développement dépassent largement les prévisions (Alter et Ginzberg (1978), Davis et Olson (1985), Helms (1984), Helms et Weiss (1982), McFarlan (1981), Weiss (1980), Wysong (1983)).

5. Les bénéfices anticipés lors de la décision de développer le système ne sont pas atteints (Davis et Olson (1985), Helms et Weiss (1983), McFarlan (1981), Weiss (1980)).

6. Le développement du système ne s'effectue pas en accord avec les politiques de l'entreprise (Burch et Sardinas (1978), Foh (1983), Haeckel et Johnson (1983), Hannye (1977), Helms (1984), Helms et Weiss (1983), Perry et FitzGerald (1977), Pliniussen (1983), Rittenberg et Purdy (1978), Weiss (1980)).

7. Le système ne répond pas aux besoins des usagers (Alter et Ginzberg (1978), Helms (1983), Helms (1984), Helms et Weiss (1983), Perry et Kuong (1980), Plinuissen (1983), Rittenberg et Davis (1977), Standford Research Institute (1977), Weiss (1980), Wysong (1983)).

8. Les contrôles nécessaires pour les applications ne sont pas incorporés au système (Fitzgerald (1976), Foh (1983), Hannye (1977), Helms (1983), Helms (1984), Helms et Weiss (1983), Holley et Cash (1981), Mautz, Merten et Severance (1984), Merten et Severance (1981), Miller (1980), Perry et FitzGerald (1977), Rittenberg et Davis (1977), Rittenberg et Purdy (1978), Standford Research Institute (1977a), Standford Research Institute (1977 b), Weiss (1980)).

9. L'accès aux données n'est pas restreint aux personnes autorisées (Carlow et Johnson (1984), Dascher et Harmon (1984), FitzGerald (1978), Holley et Reynolds (1984), Merten et Severance (1981), Taylor (1982), Wysong (1983)).

10. Absence d'une piste de vérification permettant de faire le suivi du traitement d'une donnée (Dascher et Harmon (1984), FitzGerald (1978), Foh (1983), Hannye (1977), Helms et Weiss (1983), Holley et Reynolds (1984), Miller (1980), Perry et Kuong (1980), Perry et FitzGerald (1977), Rittenberg et Davis (1977), Standford Research Institute (1977a), Standford Research Institute (1977b), Wysong (1983)).

11. Les tests effectués pour juger du bon fonctionnement et de la qualité du système sont inadéquats ou incomplets (Davis et Olson (1985) Standford Research Institute (1977b), Weiss (1980), Wysong (1983)).

12. Les procédures liées à la conversion de l'ancien au nouveau système sont déficientes (Foh (1983), Rittenberg et Davis (1977), Wysong (1983)).

13. La performance technique du système est moindre que celle estimée lors de la planification (Davis et Olson (1985) McFarlan (1981)).

14. Les tâches ne sont pas adéquatement réparties entre les gens de façon à assurer un bon contrôle (Burch et Sardinas (1978), Davis et Olson (1985), Plinuissen (1983)).

15. Des informations importantes peuvent être diffusées illégalement si les contrôles adéquats ne sont pas mis en place (Dascher et Harmon (1984 a), Dascher et Harmon (1984b), FitzGerald (1978), Lindup (1984), Merten et Severance (1981), Pérès (1981), Sébarine (1981)).

16. Des informations nécessaires au maintien des opérations peuvent être détruites si les contrôles adéquats ne sont pas mis en place (Dascher et Harmon (1984a), Dascher et Harmon (1984b), Ewald (1978), Farmer (1983), Mautz, Merten et Severance (1984), Merten et Severance (1981), Pérès (1981), Rushinek et Rushinek (1983), Sébarine (1981), Wysong (1983)).

17. Des données peuvent être falsifiées et entraîner des décisions erronées (Carlow et Johnson (1984), Dascher et Harmon (1984a), Dascher et Harmon (1984b), Ewald (1978), Farmer (1983), FitzGerald (1978), Mautz, Merten et Severance (1984), Merten et Severance (1981), Pérès (1981), Perry et FitzGerald (1977), Rushinek et Rushinek (1983), Standford Research Institute (1977b), Wysong (1983)).

18. Le système ne produit pas certaines informations nécessaires ou les fournit trop tard (Dascher et Harmon (1984b), Feltham (1968), Foh (1983), Perry et Kuong (1980)).

19. Le système produit des informations inexactes (Carlow et Johnson (1984), Ewald (1978), Feltham (1968), FitzGerald (1978), Lindup (1984), Pérès (1981), Perry et Kuong (1980), Plinuissen (1983), Rushinek et Rushinek (1983)).

20. Le système produit des informations non pertinentes ou incomplètes (Feltham (1968), FitzGerald (1978), Perry et Kuong (1980), Standford Research Institute (1977b), Wysong (1983)).

Le questionnaire et une lettre de rappel ont été transmis par la poste à 300 gestionnaires de haut niveau sélectionnés selon la méthode de l'échantillonnage systématique.

Analyse des résultats

Le taux de réponse s'établit à 23%, ce qui s'avère acceptable selon la population visée (dirigeants de haut niveau) et le type d'instruments

employés (questionnaire transmis par la poste et lettre de rappel). Quant aux répondants, ils proviennent de secteurs d'activités variés; 39,1% occupent une fonction reliée à la finance ou à la comptabilité, 11,6% une fonction reliée à la vérification, 14,5% une fonction reliée à l'informatique et 30,4% une fonction reliée à l'administration générale. Les réponses ne proviennent donc pas de néophytes ayant peu de connaissances des termes et des concepts employés. Enfin, 18% des entreprises peuvent être considérées comme des PME selon leur nombre d'employés (deux cent cinquante ou moins) et leur chiffre d'affaires (entre 500 000$ et 25$ millions).

Les hypothèses énoncées précédemment ont été testées à l'aide du test du χ^2, une première fois en ne se préoccupant pas de la variable contrôle "importance du risque" et une deuxième en ne retenant que les réponses où le gestionnaire avait jugé le risque important. Dans les deux cas, les résultats obtenus confirment l'hypothèse H1, les dirigeants d'entreprises semblant prôner une participation différente des vérificateurs selon que le système développé soit un système d'information comptable ou un système d'information de gestion (Tableaux 1 et 2).

Quelques constatations:

.les gestionnaires sont assez favorables à la participation des vérificateurs

.la réponse "aucun vérificateur" présente toujours un pourcentage inférieur pour le système d'information comptable par rapport au système d'information de gestion, quel que soit le risque

.pour chacun des risques, le vérificateur interne est impliqué dans plus de 50% des réponses sauf en ce qui concerne un problème au niveau de la performance technique, qu'il s'agisse d'un système d'information comptable ou d'un système d'information de gestion

.la participation d'un vérificateur externe autre que celui chargé de la vérification des livres recueille peu d'assentiment. Il se pourrait que les répondants n'aient pas détecté le problème de l'indépendance des vérificateurs, ou ne l'aient pas jugé important, ou aient évalué de façon négative le rapport coûts-bénéfices

.la participation conjugée du vérificateur externe actuel et du vérificateur interne recueille quelques adhésions selon les risques et présente un pourcentage d'occurences supérieur à 20% pour les risques 8, 9, 10, 15, 16, 17, 19 lorsqu'il s'agit d'un système d'information comptable et pour le risque 17 lorsqu'il s'agit d'un système d'information de gestion

Les résultats révèlent aussi des différences significatives reliées à la fonction du gestionnaire (H2). L'hypothèse se trouve confirmée pour les gestionnaires dont la fonction est reliée à la comptabilité. Leurs réponses se distinguent nettement de celles des autres gestionnaires (Tableau 3). Pour le système d'information comptable, la principale différence se situe au niveau d'un autre vérificateur externe; ce dernier recueille moins d'adhésion de la part des comptables. Ces résultats concordent avec l'étude de Hartley et Ross (1972) indiquant que les experts-comptables considèrent qu'il doit être permis au vérificateur de l'entreprise d'offrir tout service-conseil sollicité. Le problème de l'indépendance ne

semble pas intervenir dans leur réflexion. En ce qui concerne le système d'information de gestion, les principales différences concernent encore la participation d'un autre vérificateur externe mais aussi celle du vérificateur externe actuel dont la participation est moins souvent souhaitée par les comptables.

L'hypothèse se trouve partiellement confirmée lorsque la fonction du gestionnaire est reliée à l'informatique (Tableau 4). Pour ce qui est du système d'information comptable, il n'existe aucune différence significative entre les réponses des informaticiens et celles des autres gestionnaires. Pour le système d'information de gestion, la participation prônée par ces deux groupes est cependant fort différente, les informaticiens souhaitant alors que la participation des vérificateurs soit des plus réduites.

L'hypothèse H3 est liée à la taille de l'entreprise à laquelle sont rattachés les gestionnaires. Cette hypothèse est partiellement confirmée (Tableau 5). Pour le développement d'un système d'information comptable, les gestionnaires rattachés à une PME prônent une moins grande participation des vérificateurs internes et cochent beaucoup plus souvent la réponse "aucun vérificateur". Ces résultats peuvent être expliqués par divers facteurs: des ressources financières plus limitées dans les PME, des systèmes d'information comptable moins complexes et l'absence de vérificateurs internes. Le contrôleur peut avoir la possibilité de collaborer plus étroitement avec les informaticiens pour le développement de systèmes d'information comptable. Les réponses des gestionnaires rattachés à une PME ou à une grande entreprise ne présentent pas de différence significative pour les systèmes d'information de gestion.

Les résultats obtenus et les conclusions dégagées ne peuvent être présentés sans indiquer certaines limitations qui constituent la toile de fonds de l'étude. Le taux de réponse est de 23% et il s'avère impossible de déterminer qu'elles auraient été les réponses des non-répondants et d'en mesurer l'impact. L'instrument de mesure utilisé manipulait deux variables soit "système d'information comptable" et "système d'information de gestion". La distinction entre ces deux systèmes dans le questionnaire a pu inciter le répondant à établir une distinction artificielle. De plus, ce dernier était astreint à un éventail de réponses suggérant la participation de vérificateurs, ce qui a pu avoir comme conséquence une attitude plus favorable envers cette participation. Une autre limitation tient à ce que nous demandions aux gestionnaires de prendre de façon individuelle une décision qui relève habituellement de plusieurs personnes dirigeant l'entreprise. Enfin, les répondants présentaient des profils assez hétérogènes en ce qui concerne le secteur d'activités où oeuvrent les entreprises, cependant la majorité possédait de bonnes connaissances en comptabilité, en contrôle, en vérification et en informatique.

Conclusion

La décision des gestionnaires de faire participer ou non des vérificateurs au développement de systèmes d'information semble donc influencée

par la nature du système. De façon générale, les gestionnaires se montrent assez favorables à la participation des vérificateurs et la présence du vérificateur interne est très souvent souhaitée par les répondants. La participation du vérificateur externe de l'entreprise recueille un peu moins d'adhésion et s'ajoute souvent à celle du vérificateur interne. Quant au problème de l'impact de cette participation sur l'indépendance du vérificateur, il semble susciter peu d'intérêt chez les gestionnaires. Les gestionnaires dont la fonction est reliée à la comptabilité prônent une participation des vérificateurs différente de celle prônée par les autres gestionnaires. Ceux dont la tâche est reliée à l'informatique présentent des opinions différentes des autres gestionnaires pour le développement de systèmes d'information de gestion. Enfin, les gestionnaires rattachés à une PME prônent une moins grande participation des vérificateurs au développement de systèmes que ceux rattachés à une grande entreprise.

Cette recherche à caractère exploratoire laisse entrevoir de nombreuses interrogations et implications. La participation de vérificateurs au développement de systèmes peut-elle s'avérer une stratégie efficace pour contrôler le processus de développement et s'assurer de la qualité du système produit? N'y a-t-il pas danger que les gestionnaires et usagers abdiquent leur rôle et négligent de s'impliquer dans le processus de développement en se reposant sur les vérificateurs? Quelles que soient les personnes impliquées dans le développement de systèmes d'information, n'y aurait-il pas lieu de sensibiliser les informaticiens aux problèmes de contrôle, à leur impact et aux objectifs organisationnels? Ce rôle est-il assumé par les directeurs de projets ou devrait-il l'être? Il faudrait étayer de façon empirique les bénéfices que la littérature associe à la participation des vérificateurs et procéder à une analyse coûts-bénéfices du point de vue de l'entreprise. Quant aux vérificateurs, ils doivent s'interroger sur la pertinence d'une telle participation. Quels en sont, pour eux, les bénéfices et les coûts? L'un de ces coûts peut être une diminution de l'indépendance perçue par le public. Qu'en pensent les organismes de réglementation? Les vérificateurs possèdent-ils les compétences et l'expertise pour que leur participation réponde aux attentes des gestionnaires et à leurs propres attentes? Le vérificateur doit-il être impliqué dans tout le cycle de développement? Quelles sont les tâches qui lui incombent?

Le sujet s'avère donc riche en interrogations et en avenues de recherche, tout comme le domaine d'interaction des systèmes d'information et des sciences comptables. Il est important que les chercheurs y portent attention afin d'en dévoiler les écueils et de suggérer des stratégies pertinentes aux gestionnaires.

Figure 1 Modèle

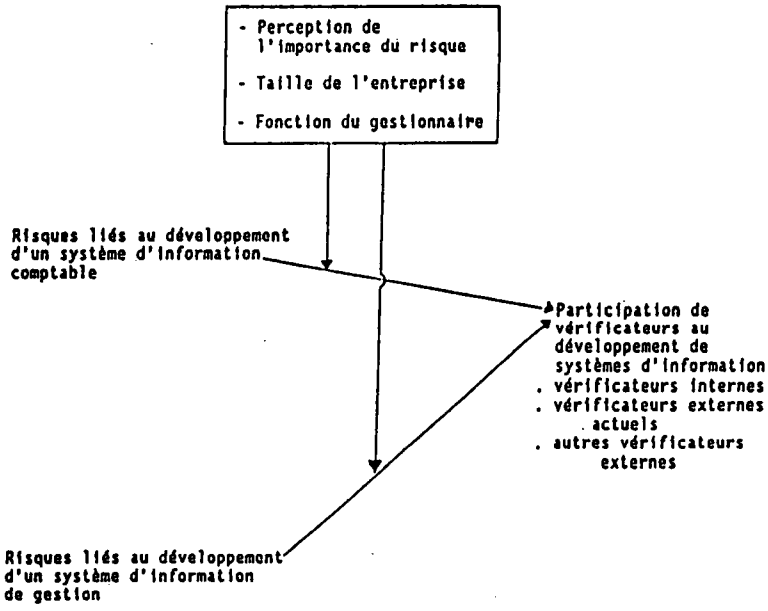


Figure 2 Section du questionnaire

QUESTIONNAIRE

Les situations qui suivent RISQUENT de se produire lors du développement d'un système d'information ou de résulter de ce développement. Pour chaque cas, indiquez si vous feriez participer ou non des vérificateurs dans l'équipe de développement et si oui, LE OU LESQUELS ?

1. Une documentation incomplète ou inadequate du processeus de développement et du système. risque important ☐ oui ☐ non

système d'information comptable				système d'information de gestion			
aucun	externe actuel	autre externe	interne	aucun	externe actuel	autre externe	interne
☐	☐	☐	☐	☐	☐	☐	☐

2. La mise en place d'un système ne correspondant pas à la structure organisationnelle de l'entreprise. risque important ☐ oui ☐ non

système d'information comptable				système d'information de gestion			
aucun	externe actuel	autre externe	interne	aucun	externe actuel	autre externe	interne
☐	☐	☐	☐	☐	☐	☐	☐

TABLEAU 1

PARTICIPATION DES VÉRIFICATEURS SELON QUE LE SYSTÈME DÉVELOPPÉ SOIT UN SYSTÈME D'INFORMATION COMPTABLE OU UN SYSTÈME D'INFORMATION DE GESTION

(SANS TENIR COMPTE DE L'IMPORTANCE DU RISQUE)

	SYSTÈME D'INFORMATION COMPTABLE	SYSTÈME D'INFORMATION DE GESTION	TOTAL
Aucun	263	365	628
Autre externe	47	44	91
Externe actuel	146	70	216
Interne	644	722	1 366
Externe actuel et interne	233	123	356
Total	1 333	1 324	2 657

$\chi^2 = 81.82$ $p < .001$

Nombre de degrés de liberté: 4

TABLEAU 2

PARTICIPATION DES VÉRIFICATEURS SELON QUE LE SYSTÈME DÉVELOPPÉ SOIT UN SYSTÈME D'INFORMATION COMPTABLE OU UN SYSTÈME D'INFORMATION DE GESTION

(EN TENANT COMPTE DE L'IMPORTANCE DU RISQUE)

	SYSTÈME D'INFORMATION COMPTABLE	SYSTÈME D'INFORMATION DE GESTION	TOTAL
Aucun	128	203	331
Autre externe	35	43	78
Externe actuel	124	79	203
Interne	511	560	1 071
Externe actuel et interne	206	112	318
Total	1 004	997	2 001

$\chi^2 = 57.79$ $p < .001$

Nombre de degrés de liberté: 4

TABLEAU 3

PARTICIPATION DES VÉRIFICATEURS SELON QUE LA FONCTION DES GESTIONNAIRES EST RELIÉE OU NON À LA COMPTABILITÉ

Système d'information comptable

	COMPTABILITÉ	AUTRES	TOTAL
Aucun	79	44	123
Autre externe	6	28	34
Externe actuel	62	62	124
Interne	292	195	487
Externe actuel et interne	102	83	185
Total	541	412	953

$\chi^2 = 28.53$ $p < .001$

Nombre de degrés de liberté: 4

Système d'information de gestion

	COMPTABILITÉ	AUTRES	TOTAL
Aucun	120	72	192
Autre externe	8	33	41
Externe actuel	23	37	60
Interne	341	211	552
Externe actuel et interne	49	51	100
Total	541	404	945

$\chi^2 = 42.19$ $p < .001$

Nombre de degrés de liberté: 4

TABLEAU 4

PARTICIPATION DES VÉRIFICATEURS SELON QUE LA FONCTION DES GESTIONNAIRES EST RELIÉE OU NON À L'INFORMATIQUE

Système d'information comptable

	INFORMATIQUE	AUTRES	TOTAL
Aucun	16	107	123
Autre externe	4	30	34
Externe actuel	14	110	124
Interne	47	440	487
Externe actuel et interne	24	161	185
Total	105	848	953

$\chi^2 = 2.18$ $p < .75$ (non-significatif)

Nombre de degrés de liberté: 4

Système d'information de gestion

	INFORMATIQUE	AUTRES	TOTAL
Aucun	33	159	192
Autre externe	5	36	41
Externe actuel	10	50	60
Interne	41	511	552
Externe actuel et interne	8	92	100
Total	97	848	945

$\chi^2 = 18.21$ $p < .005$

Nombre de degrés de liberté: 4

TABLEAU 5

PARTICIPATION DES VÉRIFICATEURS SELON QU'IL S'AGISSE D'UNE PME OU D'UNE GRANDE ENTREPRISE

Système d'information comptable

	PME	GRANDE ENTREPRISE	TOTAL
Aucun	51	79	130
Autre externe	8	24	32
Externe actuel	17	102	119
Interne	66	439	505
Externe actuel et interne	41	163	204
Total	183	807	990

$\chi^2 = 49.61$ $p < .001$

Nombre de degrés de liberté: 4

Système d'information de gestion

	PME	GRANDE ENTREPRISE	TOTAL
Aucun	52	152	204
Autre externe	6	33	39
Externe actuel	8	51	59
Interne	102	467	569
Externe actuel et interne	16	94	110
Total	184	797	981

$\chi^2 = 8.94$ $p < .10$ (non-significatif)

Nombre de degrés de liberté: 4

RÉFÉRENCES

Alter, Steven et Michael Ginzberg, "Managing Uncertainty in MIS Implementation", Sloan Management Review (Fall 1978) pp. 23-31.

Burch, John G. Jr. et Joseph L. Sardinas Jr., Computer Control and Audit, A Total Systems Approach (John Wiley and Sons, New York, 1978) 492 pages.

Campfield, William L., "A Look at Responses to Audit Findings", The Internal Auditor (Vol. 40, October 1983) pp. 49-52.

Carlow, Alan et Bart Johnson, "Overcoming the Mystique of EDP Auditing", Management Accounting (August 1984) pp. 30-37.

Comité sur les stratégies à long terme, "Définition du rôle de la profession comptable", Perspectives (Bulletin du Comité sur les stratégies à long terme de l'Institut canadien des comptables agréés, janvier 1986) 2 pages.

Dascher, Paul E. et W. Ken Harmon, "Assessing Microcomputer Risks and Controls for Clients", CPA Journal (May 1984) pp. 36-41.

_____ et W. Ken Harmon, "The Dark Side of Small Business Computers" Management Accounting (May 1984) pp. 62-67.

Davis, Gordon B. et Margrethe H. Olson, Management Information Systems, Conceptual, Foundations, Structure, and Development (McGraw-Hill Inc., Second edition, 1985) 693 pages.

Ewald, James T., "A Pragmatic Assessment of Data Processing Risks", Financial Executive (July 1978) pp.32-37.

Farmer, Dale F., "Confessions of an EDP Auditor", Datamation (July 1983) p. 193-196-198.

Feltham, Gerald A., "The Value of Information", The Accounting Review (October 1968) pp. 685-696.

Fitzgerald, Jerry, "EDP Risk Analysis for Contingency Planning", EDPACS, The EDP Audit, Control and Security Newsletter (August 1978) pp. 1-8.

Fitzgerald, Thomas H., "A Methodology for Auditing Project Development", EDPACS, The EDP Audit, Control and Security Newsletter (Note de Harold Weiss) (June 1976) pp. 1-15.

Foh, Noreen, "The Auditor's Role in Preimplementation Review", CA Magazine (May 1983) pp. 72-75.

Folk, Mark A., "The Auditor's Role in System Development", EDPACS, The EDP Audit, Control and Security Newsletter (November 1980) pp. 18-20.

Haeckel, David A et Bruce B. Johnson, "The Importance of Management Input in the Development of Information Systems Security", Management Review (August 1983) pp. 26-41.

Hannye, L. George, "Auditors and DP'ers Benefit from Association in the Systems Development Process", The Internal Auditor (December 1977) pp. 67-70.

Hartley, Ronald V et Timothy L. Ross, "MAS and Audit Independence: an Image Problem", The Journal of Accountancy (November 1972) pp. 42-51.

Helms, Glenn L., An Examination of the Impact of IS Auditor Involvement in Systems Development on the Quality of New Application Systems (Dissertation presented to the Faculty of the College of Business Administration, University of Houston, December 1983) 247 pages.

_____ "Current Information Systems Auditor Involvement in Systems Development: an Update", The EDP Auditor Journal (Volume V, 1984) pp. 53-60.

_____ et Ira R. Weiss, "Auditor Involvement in the Systems Development Life Cycle", The Internal Auditor (December 1983) pp. 41-44.

_____ et Ira Weiss, "Current Information Systems Auditor Involvement in Systems Development: A Survey", The EDP Auditor (Summer 1982) pp. 13-20.

Holley, Charles L. et Daniel M. Cash, "Evaluations of EDP Systems", Journal of Systems Management, (June 1981) pp. 16-21.

_____ et Keith Reynolds, "Audit Concerns in an On-Line Distributed Computer Network", Journal of Systems Management (June 1984) pp. 32-36.

Institut of Internal Auditors, Inc., "Exposure Draft of the Standards for the Professional Practice of Internal Auditing", The Internal Auditor, (December 1977) pp.16-31.

Lindup, Ken, "Auditor's Key Role in Strengthening Network Defences", Accountancy (Vol. 95, October 1984) pp. 76, 78.

Mautz, Robert K. et Alan G. Merten, Dennis G. Severance, "Corporate Computer Control Guide", (part one) Financial Executive (June 1984) pp. 25-36.

McFalan, F. Warren, "Porfolio Approach to Information Systems", Harvard Business Review (September-October 1981), pp. 142-150.

Merten, Alan G. et Dennis G. Severance, "Data Processing Control: A State-of-the-Art Survey of Attitudes and Concerns of DP Executives", MIS Quarterly, (June 1981) pp. 11-32.

Miller, Frederick, W., "Obsoleting the Old Role", Infosystems (June 1980) pp. 66-69-80.

Pérès, André, "Les risques du traitement informatique", CA Magazine (août 1981) pp. 63-73.

Perry, William E. et Javier F. Kuong, "How to Test Internal Control and Integrity in Computerized Systems", Management Advisory Publications (1980) pp. A-1 à I-4.

_____ et Jerry FitzGerald, "Designing for Auditability", Datamation (August 1977) pp. 46-50.

Pliniussen, John K., "Computer Risks: Recognition, Assessment, Control", Cost and Management (July-August 1983) pp.50-54.

Rittenberg, Larry E. et Gordon B. Davis, "The Roles of Internal and External Auditors in Auditing EDP Systems", The Journal of Accountancy (December 1977) pp.51-58.

_____ et Charles R. Purdy, "The Internal Auditor's Role in MIS Developments", MIS Quarterly (December 1978) pp. 47-57.

Rushinek, Avi et Sara Rushinek, "Security: Vital Controls in an Accounting Information Systems", Accountancy (March 1983) pp. 65-67.

Sébarine, Guillaume, "Sécurité: de l'indiscrétion au sabotage", 01 informatique (No 151, juin-juillet 1981) pp. 50-54.

Stanford Research Institute, Systems Auditability and Control Study, Data Processing Audit Practices Report (The Institut of Internal Auditors, Inc., 1977a) 215 pages.

Stanford Research Institute, Systems Auditability and Control Study, Executive Report (The Institute of Internal Auditors, Inc., 1977b) 20 pages.

Tashji, Gabriel G., "The EDP Auditor's Role in System Application Development", The Internal Auditor (December 1981), pp. 45-53.

Taylor, Robert S., "Benefits and Costs of Information Use", Proceeding of the 45th ASIS Annual Meeting, (Volume 19, Colombus, Ohio, October 17-21 1982) pp. 296-297.

Weiss, Ira R., "Auditability of Software : A Survey of Techniques and Costs", MIS Quarterly (December 1980) pp. 39-50.

Wysong, Dr. Earl M. Jr., "Using the Internal Auditor for System Design Projects", Journal of Systems Management (July 1983) pp. 28-32.

ROLES OF THE INFORMATION PREPARER/PROVIDER ANOTHER DIMENSION OF AIS/MIS

By Tev Estrin, University of Windsor

"The managerial accounting system is defined as the formal system of accumulating and reporting data useful for the achievement of management objectives. (Moriarity & Allen 1987 p. 5). Managerial accounting is concerned with providing information to managers. (Garrison 1982 p. 4) The information is systematically collected classified, summarized, analyzed and reported to assist managers in their decision-making and control activities.(Kaplan 1982 p.1) These decisions, and their implementation, are assumed to determine the success or failure of the managers of a firm in achieving their objectives. Although the manager may receive information from many sources, the accounting system, according to Horngren and Sundem (1987 p.3) "is the major quantitative information system in almost every organization".

This paper argues that much of the information that a manager uses for making decisions and implementing action, comes from various individuals who have different roles and may have a personal stake in the acceptance and particular use of the information they transmit. The personal interests of both accountants and non-accountants who supply information to decision makers may be inconsistent with the interests of the decision makers in both organizational and a personal contexts. This is an important factor in the design, understanding, and use of information systems is the study of the various relationships between the users of information and its suppliers. A model of these relationships which is based on organizational structure, reward structure and external factors is developed in this paper.

It has been suggested (Birnberg, Turpolec & Young 1983) that because of the ability of subordinates and others to distort information to their own ends, that accounting can best be understood within an organizational context. "With accounting so intertwined with organizational functioning it is surprising that so little is known of the organizational nature of accounting practice". (Hopwood 1983) Certainly one of the key factors in analyzing this organizational context will be the relationship between the information provider and the decision-maker.

The field of Agency Theory (Baiman 1982, or Thornton 1984 & 1985) postulates that since the accounting information system determines rewards, it often will be a matter of contractual negotiation between owner/shareholder(s) and manager/agent(s) who run the enterprise. For example, in the case where the manager/ agent gets a bonus based on a share of the profits, he/she will try to use an information system which will produce the highest

short run profit numbers. The owner, on the other hand, will want to choose an information system which provides a balance between rewarding the agent sufficiently to motivate him, and with retaining the optimal amount of the profits of the enterprise for himself. At the core of Agency theory is the notion that the accounting information system and therefore the accounting information on which managerial decisions are based, is not neutral but rather can be reflective of the interests of those who determine how the information shall be collected.

Ashton (1981) in a study of the determinants of choice of informations systems by information evaluators (e.g. accountants) implies that an evaluator's payoff in part depends on factors which do not derive from a decision maker's actions as well as those that do. They may choose a system which makes their job easier or which enhances their own prestige, for example. Presumably then, to the extent that the evaluator is free to choose from among various information systems, as is implied in this and other information economics research, he/she may make the choice so as to compromise the objectives of the decision maker in favour of his/her own rewards.

As an extension of Agency theory, it can be postulated that those who provide or prepare the information for the manager can also influence the decision by their choice of information system and selective choice of information. Since the interests of those who provide information are generally also not wholly consistent with the managers who are the users of the information there will be a tension, similar to that described in Agency Theory, in the development of information systems which play off the interests of the information provider (management accountant etc.) with those of the information user (manager/ decision-maker).

Williamson (1983) has argued, that just as many varieties of non-formal contractual relationships exist between transacting entities, so too will specific variations of information system evolve. These will be products of informal negotiation between the information provider, trading on the basis of expert power, versus the information user, negotiating on the strength of bureaucratic position, reward power and likely a greater knowledge of strategy and objectives of the enterprise.

The conventional management information systems process is depicted in figure 1 below. Information based on measurement or observation of the activities of the enterprise is collected by some information providers **(IP's)** who may summarize and analyze the information before presenting it to the decision-maker **(IU)**. The **IP's** may be accountants or other personnel within a firm or they may be persons outside the firm such as consultants or suppliers. The **IU** may have several **IP's** supplying him with information of various kinds in addition to collecting some on his own and receiving informal, non-systematic information from various sources. Some of the information received is in the

nature of a feedback loop wherein the results of prior decisions are compared to the a priori expectations. The IU also has certain skills and experience with which to screen, analyze and evaluate the information and to check the validity and reliability of the information he uses which he receives from the IP.

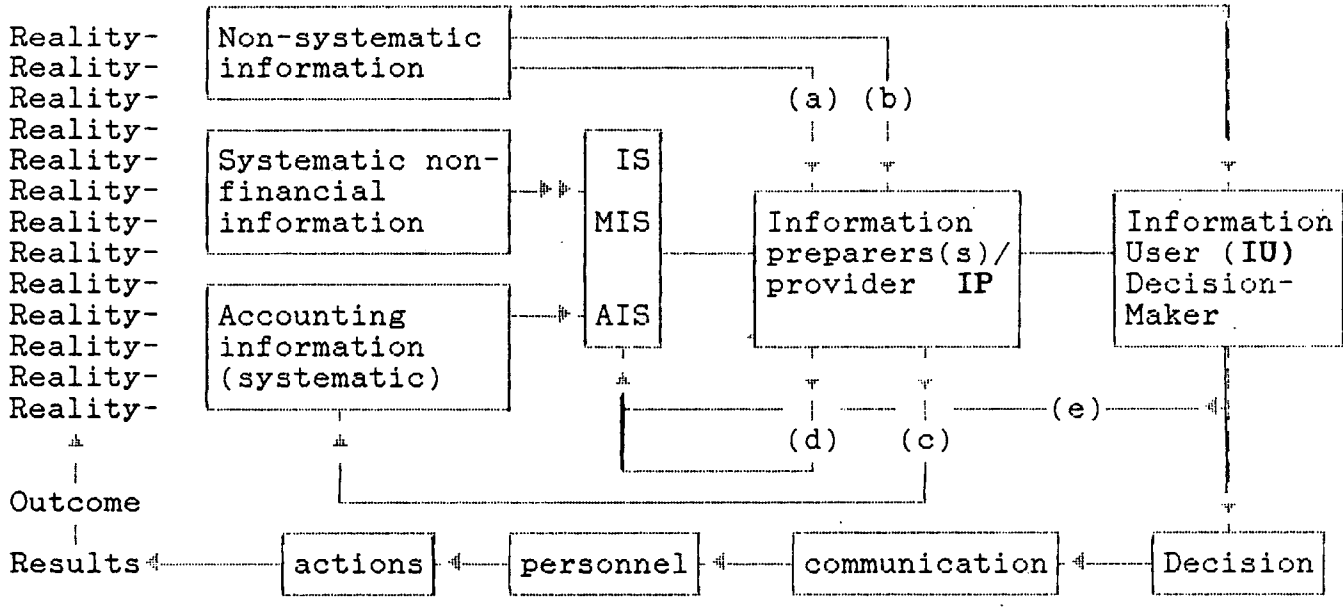


FIGURE 1

(a) = formal non-systematic information
(b) = informal non-systematic information
(c) = effects of IP on reality - selective perception
(d) = effect of IP on the IS - systems and techniques
(e) = effect of IU on the IS - systems and controls determination

In the above scenario the IP is assumed to be neutral and that his/her personal interests coincide perfectly with the decision-maker to whom he reports and the enterprise for which he works. That is, provided that information has been collected, analyzed and presented in a competent manner, he has nothing personal to gain or lose by the presentation or the use of any particular set of information. This is the assumption of the unbiased accountant or auditor and assumes that there is a direct relation between accounting reports or information and management decisions (Bruns 1968).

Although it has long been recognized that the IP will have limitations of ability and be affected by his/her perceptual filters, it has nonetheless, been assumed that there will be no self-interested or indeed Machiavellian, selection and presentation of alternative sets of information. Nor will there be a conscious distortion of information, by the IP. In the real world however, and as has long been established in communication theory, the purveyors of information are often not unbiased. A major factor in information bias will be based on an interplay between the actual reward structure, the reward structure perceived by the IP and the degree of control exercised by the IU. (See figure 2).

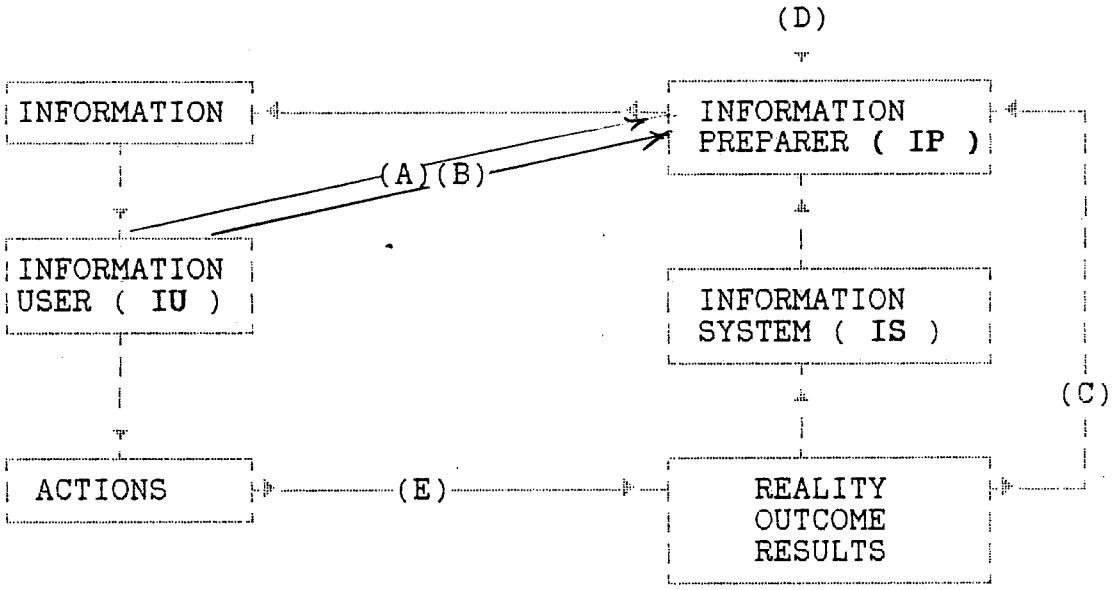


FIGURE 2. Rewards of the IP

(A) = reward based on information presentation (input) (mediated by the IU)
(B) = reward based on output of the system (mediated by IU)
(C) = direct reward by virtue of the outcome
(D) = exogenous rewards
(E) = effects of actions taken

There are several different kinds of reward that the IP can get given this model:

First, the IU, assuming he is the superior of the IP, can (A) directly reward the IP for a a generally good job in supplying information. Such rewards can be salary increases, promotions or praise.

Secondly, the IU may (B) reward the IP based on some measure of output. This may take the form of a bonus on doing a certain

amount of work, or the successful completion of a project, or else it may be based on a share of departmental rewards or company profits which presumably are influenced by the efforts of the IP.

Thirdly, An IP may benefit independently (C) of the IU based on the results of the IU's action. For example if the IP influenced the IU to take some action which would make the IP's position more important.

Arguably a most common form of reward is that which IP's can give themselves by creating information dependency. Information dependency is created by developing complex systems which require the assistance of the particular IP who developed them. The creation of such forms of dependency is enhanced by government regulation and by laws or pronouncements of official and other organizations which dictate and complicate accounting or other information system practice.

Thus IP's rewards can be based on efficiency of information provided, on the basis of the outcomes of the decisions based on that information, the IP may seek by dissembling to gain approval for information the use of which will result in a reward for the IP independently of the IU and lastly the IP can create an information dependency which will improve job security.

Much of the information obtained by IU's for decisions does not come from accountants. Even accountants, especially staff accountants, as noted above, do not always fulfill the assumptions of unbiased neutrality with respect to the information provided. The IP's may gain personally in several ways, by shaping the information they present to the IU. In many cases the reward system of the IP is controlled directly by the IU, (decision-maker), who may reward input and/or output based on his own knowledge and biases. In other instances the IP will prefer some decisions and actions of the IU to others, because of how their outcomes will affect him/her personally, and that will affect the information presented. Moreover the degree of control of information possible may be a major factor in the motivation of the IP. Thus these factors must be a major consideration in the design and implementation of management information systems.

Following the line of reasoning developed in Agency theory and by Williamson; formal, conventional and informal contracts occur between the information provider and the information user which are in part determined by the reward structure of the information provider and are of major significance in the decision process.

There are a number of possible relationships between IP and IU which will affect the information systems. Some of these relationships can be categorized as follows:

ASSISTANT: The assistant IP merely gathers information at the request and direction of the IU. The pure assistant has no direct

stake in the outcome of the decision action taken by the IU. Often the job is gathering and presenting routine score-keeping and attention directing information for subsequent analysis by the IU. The work done is narrowly focused, such as comparing: actuals to budget, figures of different periods, and similar departments. If any work relating to problem solving activity is undertaken it is well structured and controlled by the superior.

AIDE: These IPs are higher level assistants who in addition to some of the routine data tasks, undertake special studies using data in the files in a non-routine manner, tasks which require more skill and ability including problem solving in which one of A SET of alternative courses of action is recommended by the aide. Aides are more closely and personally identified with their superiors. They may act semi-independently under general instructions, according to what they themselves feel is in the best interests of their superior.

ACCOUNTANT: Aside form concentrating primarily on systematic financial and some quantitative information, an Accountant IP is supposed to be neutral as described above in terms of personal interest in the outcome of a particular decision. The professional accountant obeys rules and ethical standards set out by an external body and for the most part applies techniques and methods taught and sanctioned by that body. Accountants may work in the role of a subordinate, a staff specialist or an independent outside professional.

ACADEMIC: This term is used to describe the situation where the IP is financially detached from the IU. The role is not generally found in business organizations . This type of IP is not paid for the information and does not benefit directly in any way from the success of the enterprise nor suffer from its losses. Any information he offers is purely academic. Such would be the case for example, where a University professor gained access to a firm for purposes of writing a case study.

ADVOCATE: Unlike the Assistant or the Accountant, the Advocate does have (or perceives he has) some personal advantage in managing the information presented to the IU so that some actions will be more likely than others. He may be seeking recognition or a promotion by having his ideas & proposals prevail or by massaging the reporting numbers of his department in a favorable light. Unlike the Adversary (explained later) however, he does not have independence in controlling the information system nor a formal contractual relationship with respect to any rewards he might receive. Nonetheless he may still be able to shape the information presented and the information system used to a considerable extent.

AGENT: The agent has a negotiated contractual relationship to the decision maker with respect to the information system and the reward system. As described in the agency theory literature, it is the role of the manager who is in a position to negotiate with a

superior manager or owner of an enterprise about what reports will be forwarded, how they will be collected what information they will contain as well as the method of calculating the rewards to the agent based on these reports. A form of agency which is becoming more common in business recently is that of the franchisee, whose reporting and reward relationship is spelled out in a formal legal contract.

ADMINISTRATOR: Each manager has a supervisor or superior who will pass down decision making information which has probably been provided by his/her **IP's**. In this case the formal reward power will flow in the opposite direction although the subordinate does

ASSOCIATE: Managers get information from many **IP's** in other parts of the firm where there is no formal reporting relationship and from informal social contacts. In most instances an associate **IP** would provide non-systematic, informal information, but there are instances where associates, partners or those on the same level in separate functions provide systematic information to one another. Associate information is solicited by the **IU** and he/she has no control over it. Obviously the information and the information systems will depend on the states of integration, and cooperation versus competition which is operating in the particular situation.

ADVISOR: Advisor **IPs** are paid consultants or experts who differ from Aides in that they are not subordinates although in large firms they may be inside consultants. Generally hired for a particular task, paid on an arm's length contractual basis and bring wider professional expertise to the preparation, analysis and interpretation and communication of information. Examples of Advisors are accountants and lawyers and other professional consultants.

ADVERSARY: Much of the information acquired by the **IU** comes via negotiation with outsiders. Much of the information on which decisions are made comes from salesmen, suppliers and outside contractors. For example, information supplied by a real estate agent can be the deciding factor in a multimillion dollar transaction. Such outsiders have a legitimate expertise and information which is important to the decision-maker in making his decision and which he most likely cannot get as efficiently from any other source. Although Adversary **IPs** are generally considered external to information systems, much of the information gathered and presented to IUs is prepared and presented by those whose interests are independent of and may even be adverse to the decision maker. However, their information is tempered by their own self-centered interests. In most cases there will be several adversaries; individuals or firms who are competitors, offering information to the decision maker.

CONCLUSIONS:

In general there are several common variables underlying the roles exhibited described in Figure 3.

The relationship of the **IP** to the **IU** can be characterized as superior/subordinate, subordinate/superior, peer, independent, contractual.

The relationship of the **IP** to the environment can be: personal only (i.e. an employee), professional (member of a professional society), organizational (Member of another firm)

The fortunes of the **IP** can be tied to the company and or the **IU** or he/she can be independent

The nature of the **IP's** activity can be ongoing cycles or infrequent episodes.

The degree to which the interests of the **IU** and **IP** are generally recognized to be dissonant can be characterized as dissonant, consonant and indeterminate.

Much of Managerial Accounting, AIS and MIS research has to do with studying the use and the effects of information on the achievement of the objectives of an enterprise as modeled in Figure 1. The behavioural aspects of this process are important areas of study in managerial accounting. As Anthony (1972) has said "the behavioral aspect of management accounting is at least as important as the economic aspect".

It is argued here that invariably decision-makers rely to a large extent on persons other than the decision-maker to supply much of the information on which to base their decisions and that there are systematic aspects to the use of such information in most given situations. Therefore one cannot truly understand the relationship between information and decision behaviour, the central focus of information systems, without considering the nature of the relationship between the information provider and the information user.

CHARACTERISTICS OF THE VARIOUS ROLES OF INFORMATION PROVIDERS (IP's)

	Relation to Information User (IU) & Company	Relation to External Entities	Tied to Success of a) IU or b) Company	Activity Frequency	Competition With IU ?	Characterization
Assistant	Subordinate	None Direct	IU	Ongoing	None	Does as directed, specific tasks with close supervision.
Aide	Subordinate	None Direct	IU	Ongoing	None	Does that which is thought to benefit IU, more discretion.
Accountant	Independent/ Subordinate	Often Professnl	Company	Ongoing	None	Formal systematic accounting, may prepare reports requested by IU.
Administrator	Superior	None Direct	Mainly Company	Regular & Episodic	None	Formal & informal evaluations, requests and general direction
Academic	Independent Contract?	Professnl	Neither	Singular	None	Unpaid consultant with no stake in the results or success of the company
Advocate	Independent/ Subordinate	None	Either	All three O, R & E	Yes	Perceives benefit by managing information presented to the IU.
Agent	Independent Formal Contract	Sometimes Professnl	Company	Ongoing	Yes	Information supplied according to terms of a contract
Associate	Peer Independent	None	Company	All Three	Yes	Peer advice sometimes cooperative. Often information is managed
Advisor	Informal Contract	Professnl Often	Neither	Singular	No.	Hired gun to give special advice and consulting
Adversary	Independent	Another Firm	Neither	Singular	Yes	Supplier or other outsider wanting to sell to the company.

FIGURE 3

BIBLIOGRAPHY

Ashton, R., "A Descriptive Study of Information Evaluation" *Journal of Accounting Research* Vol. 19 No. 1 Spring 1981 pp. 42-61

Baiman, S., "Agency Research in Managerial Accounting: A Survey" *Journal of Accounting Research* Vol. 1, 1982 pp. 154-213

Birnbirg, J.G., Turpolec, L., and Young, S.M., "The Organizational Context of Accounting" *Accounting, Organizations and Society,* Vol.8, No. 2/3 1983 pp. 111-129

Bruns Jr., W.J. "Accounting Information and Decision-Making: Some Behavioral Hypotheses" *The Accounting Review* July 1968 pp. 469-480

Garrison, R.H., *Managerial Accounting* 3rd edition 1982 (Business Publications Inc. 1982)

Horngren, C.T., & Sundem, G.L., *Introduction to Management Accounting* 7th edition (Prentice-Hall Inc.1987)

Kaplan, R.S., *Advanced Management Accounting* (Prentice-Hall 1982)

Moriarity, S. & Allen, C.P., *Cost Accounting* 2nd edition (Harper Row, 1987)

Hopwood, A.G., "On Studying Accounting in the Contexts in Which it Operates" *Accounting Organizations and Society,* Vol. 8, No. 2/3 1983 pp. 287-305

Thornton, D. "A Look at Agency Theory for the Novice - Part 1" *CA Magazine*, November 1984 pp.90-97 and - Part 2 *CA Magazine* January 1985 pp. 93-100.

Ungson, G.R., Braunstein, D.N. & Hall, P.D. "Management Information Processing: A Research Review" *Administrative Science Quarterly* Vol. 26 March 1981 pp. 116-134

Williamson, O.E., "Transaction-Cost Economics: The Governances of Contractual Relations" *The Journal of Law and Economics* pp. 233-261

THE IMPACT OF INFORMATION TECHNOLOGY ON THE ACCOUNTING PROFESSION: SOME PRELIMINARY FINDINGS

J. FISHER
Professor
School of Business & Economics
Wilfrid Laurier University
Waterloo, Ontario
(519) 884-1970

R. McINTYRE
Senior Assistant Registrar
University of Strathclyde
Glasgow, Scotland
U.K.
(041) 552-4400

THE IMPACT OF INFORMATION TECHNOLOGY ON THE ACCOUNTING PROFESSION: SOME PRELIMINARY FINDINGS

The effects of "information technology" (I.T.) - the convergence of computing and communication systems - have an impact on professional and management activities.

The accounting profession must register that changes have been made to "information" itself (Wainman 1986). The shift from paper-reliant to electronic auditing and accounting procedures creates a challenge to ensure the integrity of data in an electronic age. Information provision is expanding and society has begun to demand and accumulate all kinds of non-accounting, non-financial data; itself vulnerable to adulteration from improper management. Until recently information had to be moved physically, nowdays it moves electronically. The expectations of "management" mean that year-ends etc. are losing their relevance in an era when financial information is constantly updated and available on line at any time. Finally, information is becoming much more sophisticated with more application-specific software and hardware available to create, massage and organize it.

In one sense it may be argued that technology has changed only the way we do things leaving unaltered the fundamental nature of what we do. In another sense though it can be argued that technology does in fact change the essential nature of our professional activities and concepts. The word processor, the data-base, electronic mail and the computer are the professional and business tools we now use (Renshall 1988). The accounting profession has, by the historical accident of being the custodian of vital accounting information, captured the management information system. Until the advent of computers, accounting provided the formal financial information system for organizations (Davis 1987). All of these changes will continue to have an impact on the accounting profession, in that there will arise increasing competition for many of the traditional accounting and tax services. This was reinforced by the findings of the CICA's Long Range Strategic Planning Committee in their report "Meeting the Challenge of Change" (CICA 1986) which identified the prime need to develop skills in computer/information technology. The crucial question is whether or not the accountant will be equipped to meet the demands of information technology. During discussions with both the providers of information technology and with users it became apparent that the accounting profession has been no more immune to the spread of computing than any other sector of the economy, although such penetration (into accounting practice) appears to be somewhat less than into industry in general. It was also suggested that the continuing development and I.T. will impact on matters of organization and accounting practice, on the individual and throughout the accounting profession.

Concern for the effects of IT upon organizational life is widespread and attracting more and more interest from those who study organizations (e.g. McFarlan 1984), sociology (e.g. Form & McMillan 1983), ergonomics (e.g. Smith, Cohen, Stammerjohn, & Happ 1981); computer science (e.g. Turner 1984) organizational behaviour (e.g. Cheney & Dickson 1982), and management accounting (e.g. McCosh 1984). Early writers have tended to take a strongly deterministic view of how IT affects organizations but later empirical research (Gutek, Bikson and Mankin 1984) suggests that the effects of IT depend upon adaptive decision-making during implementation

and use. Some writers maintain that the new technology will significantly improve the jobs of office workers by allowing them to pursue more interesting challenges when freed from routine tasks (Strassman 1985) whereas others have reported more negative effects of the introduction of new technology (Medcof 1986). Other studies by Olson & Lucas 1982, examined the nature of the job to which IT was being added concluding in general terms that there are greater negative effects of IT with clerical users than with managerial users. The majority of the work in this area has concentrated on office work with very little contribution on the impact of IT on the professions. Kling (1978) however found that the work of professionals was enriched by the introduction of IT to a greater extent than that of clerical workers. A number of important factors however must be considered before one can assume that the above studies are applicable to the accounting profession. These include the difference in work patterns of accountants who are "knowledge workers" rather than clerical workers. Knowledge workers do not follow determined routine, patterns, they spend much of their time in the peripheral functions of organizing, scheduling and communicating. One of the major issues of society relative to productivity is to improve the productivity of the knowledge workers (Davis 1987). Technological innovation represents an era of great uncertainty for many knowledge workers presaging change to workload patterns, skills, requirements and their competence with new technologies. Unless these concerns are dealt with effectively they may lead to dysfunctional outcomes for organizations. Carr (1985) in conjunction with the Association of Certified Accountants, and the Department of Trade and Industry in the U.K. attended to certain of these questions through the form of fourteen case studies and provides useful data on changing employment patterns, knowledge skills and training of accounting staff.

The purpose of this present study is to examine further this seeming lack of consensus regarding the impact of new technology in the workplace and to test the proposition that "the impact of information technology on the accountant may vary according to his or her employment." This paper describes part of the findings of a larger empirical study of the impact of IT on accountants. The study was financed by an SSHRC seed money grant and was conducted by means of questionnaire survey in early 1987, with the purpose of adding to the empirical data base, and to explore further the impact of some of the accredited variables of inter-firm differences. This paper however will consider only the responses from the Public Accounting and Corporate sectors.

Data Collection and Analysis

A questionnaire was sent to 1050 accountants across Canada, drawn equally and randomly from membership lists kindly provided by the Research Departments of the Canadian Institute of Chartered Accountants; the Certified General Accountants Association of Canada; and the Society of Management Accountants of Canada. The individuals selected represented a fair cross-section in terms of activity and included a significant proportion of small- and medium-sized firms in both the Public Accounting and Corporate sectors. The questionnaires were completely confidential and without any number or identifying mark. The bulk of the responses were received by mid-January 1987, and in total there were 334 usable responses (31.8%) which was adjudged to be adequate considering the nature of the question-

naire and the various other demands for information that are placed upon firms and individuals.

Aware of possible non-response bias mail surveys, the respondents were divided into early and late respondents and compared. Early respondents were those received within 30 days and late respondents were those received between 31 to 90 days after the first mailing. Analysis of the 222 early respondents versus the 112 late respondents revealed only four minor variables with statistical differences ($p < .05$); non-response bias is not believed to be a major problem. The questionnaire covered personal and organizational profiles; use of IT systems and applications; and future developments. Those questions which required attitudinal responses incorporated Likert three and five category scales. Mann-Whitney U-test and Chi-Square test techniques were applied to the analyses. The standard measure of statistically significant differences applied was $p < .05$ and the significant results are reported in Table 17. Factors not included are deemed to be independent of employment sector.

Hypothesis: Current employment position will have an effect on how accountants view the impact of IT on the accounting profession.

This hypothesis emanates from a number of studies of the effects of IT upon organizational life and the conflicting evidence therefrom (Gutek, Bikson and Mankin 1984; Iacono & Kling 1985). The basic premise behind this hypothesis is that accountants are knowledge workers and as such do not follow a structured and predictable routine. The hypothesis tested (i.e. null hypothesis) is that the current employment position has no effect on how accountants view the impact of information technology on the accounting profession. That is, there is no difference between accountants employed in public accounting firms and those employed in the corporate sector.

Profile of Respondents

Background information concerning the respondents is highlighted in the following Tables.

Terms of Analysis	No of Respondents	% of Respondents	
Membership of Accounting Bodies			
- C.I.C.A.	113	32.3	
- C.M.A.	110	31.4	**TABLE 1**
- C.G.A.	111	31.7	
	334	31.8	
Employment Sector			
- Public Accounting Firm	92	27.5	
- Government	64	19.2	
- Corporate	174	52.1	**TABLE 2**
- Academic	3	0.9	
- Blank	1	0.3	
	334	100.0	

Terms of Analysis	No of Respondents	% of Respondents	
Period in Current Post			
- < 5	191	57.2	
- 6 - 10	91	27.2	
- 11 - 20	35	10.5	**TABLE 3**
- 21 - 30	9	2.7	
- > 30	1	0.3	
- Blank	7	2.1	
	334	100.0	
Ownership/Access of a Personal Computer			
- Yes	136	40.7	
- No	198	59.3	**TABLE 4**
	334	100.0	

Public Accounting Firms & Corporate Sector (Table 17)

In recent years computers have transformed internal record. and accounts preparation; with the advent of micro- computers this is true for both small companies, and small- to medium-sized accounting practices. Bolland, Campton and Stephenson (1987) highlight this increase in a survey of the diffusion and use of micro-computers in accounting practices in the U.S. between 1983 and 1986 viz.:-

TABLE 5 (B.C.S. Modified)
Extent of Usage of Computers or Terminals

	1983				1986			
	Small Firms %	Medium Firms %	Large Firms %	All Firms %	Small Firms %	Medium Firms %	Large Firms %	All Firms %
Firms Using Micro-Computers	40	82	96	73	74	98	99	90
Firms Not Using Micro-Computers	60	18	4	27	26	2	1	10

Obviously the amount that any organization can spend on IT is in part a function of its size. Size can be defined in several ways, two standards which are commonly applied being revenues/sales and number of employees. Here it was felt that it was generally easier and more reliable to get satisfactory data on revenues of firms in the corporate sector, with the following results:

TABLE 6
Gross Revenues of Corporate Sector Respondents

Annual Sales/Revenues	Category	Number of Respondents	Percentage of Respondents
< $20 million	Small	48	27.9
$20.01 million to $500 million	Medium	76	44.2
> $500.01 million	Large	48	27.9
		172	100.0

Those respondents in public practice and consulting sectors were categorized according to the number of partners in the firm with the following results:

TABLE 7
Partners in Public Practice and Consultancy

Number of Partners	Category	Number of Respondents	Percentage of Respondents
1 - 5	Small	64	69.6
6 - 50	Medium	13	14.1
> 50	Large	12	13.1
	Blank	3	3.2
		92	100.0

The frequencies of respondents were much as would have been expected from such a random sample.

In considering the use of Information Technology within the organization, Question 1 (Table 17) shows that 90% of respondents in accounting firms made use of IT as did 97% of those employed in the corporate sector. Almost all of the respondents from accounting firms owned the facilities compared to 50% of respondents in the corporate sector. 45% of the latter, however, incorporated a combination of ownership and rental. Recent years have seen a strong and continuing move away from bureau services to the adoption of in-house computing (Carr 1985) and this was reflected in responses to the question of provision of computer facilities.

TABLE 8
Provision of Computer Facilities

	Public Practice		Corporate Sector	
Provided by	Number of Respondents	Percentage of Respondents	Number of Respondents	Percentage of Respondents
In House Computers	67	86.0	125	77.0
Computer Bureau	-	-	4	2.0
Both of the Above	11	14.0	34	21.0
	78	100.0	163	100.0

In question 2 (Table 17) the respondents were asked to identify the major I.T. applications within their organization, and to state the type of computer used for these applications (Table 9). The mainframe computer was found to be the most widely used in the areas traditionally associated with accounting-related data processing, whereas the minicomputer not only gained favour in those areas but also was popular in the areas of financial modelling sales analysis and inventory control. The microcomputer on the other hand gained most in popularity in financial modelling. This is not surprising when one realizes that many organizations acquire microcomputers for this purpose alone.

In comparing the significant differences in responses to Question 2 in Table 17 it would appear that respondents from the accounting firms favour the use of micro-computers whereas corporate respondents favour primarily mainframe applications. They also used mini computers to a greater extent

TABLE 9
Top Five Information Technology Applications
Made Use of by Organizations

Application	Computer Type		
	Main Frame	Mini	Micro
	Percentage	Percentage	Percentage
Accounts Production	36.5[1]	15.6[2]	16.8
Payroll	32.9[2]	11.1	9.9
Financial Statement Presentation	32.6[3]	22.5[1]	41.3[2]
Purchases Ledger	26.6[4]	9.9	6.9
Inventory Control	26.3[5]	13.2[5]	10.5
Financial Modelling	14.1	14.7[3]	48.2[1]
Sales Analysis	20.4	13.8[4]	15.6
Working Paper Generation	10.2	7.5	32.6[3]
Taxation (Compliance & Planning)	10.2	8.7	26.7[4]
Cost Analysis	24.6	11.7	26.3[5]

than the accounting firms. This can perhaps be better observed from the breakdown of Table 9(a). It would appear from the above that the main use for micro-computers in the hands of practitioners is financial statement preparation and presentation, taxation and business planning, and financial modelling rather than internal practice administration thus confirming the findings of Carr (1987). Of the major IT systems used within organizations, the most common was word processing with an 82% application rate. This was closely followed by spreadsheet modelling (81%) and by data base systems (69%) and data retrieval (58%). Again a better picture can be obtained from the breakdown in Table 10. Obviously the word processing and spreadsheet packages dominate the accountant's use of the computer. These findings are very similar to those of Bolland, Compton and Stephenson (1987) who identified the spreadsheet and word processing as being the leading types of systems used in both 1983 and 1986. In addition they too highlighted the increasing use of data base systems by accountants in practice, who, contrary to some commentators, appear to be fully aware of the potential of such systems.

TABLE 9(a)
Information Technology Applications Made Use of by
Corporate Sector and Public Practice Sector

	COMPUTER TYPE					
	Main Frame		Mini		Micro	
	Corporate %	Practice %	Corporate %	Practice %	Corporate %	Practice %
Accounts Production	61.8	17.7	19.8	17.7	12.2	48.8
Payroll	62.5	12.5	16.4	27.5	13.3	32.5
Financial Statement Presentation	50.9	3.8	26.1	28.2	39.2	73.1
Purchases Ledger	61.7	13.8	20.8	20.7	12.2	20.7
Inventory Control	56.6	9.1	27.8	4.5	18.1	18.2
Financial Modelling	25.8	5.0	19.5	16.7	66.4	71.6
Sales Analysis	48.0	8.1	29.6	24.3	28.0	35.1
Working Paper Generation	19.7	10.4	16.4	13.8	51.6	74.1
Taxation (Compliance and Planning)	27.3	4.4	15.4	22.0	36.9	79.5
Cost Analysis	50.0	5.2	15.4	15.8	42.3	36.8

TABLE 10
Top Five Information Technology Systems
Made Use of by Organizations

System	Usage		
	All	Corporate	Practice
	%	%	%
Word Processing	82	81	85
Spreadsheet Modelling	81	83	82
Database Systems	69	73	49
Data Retrieval	58	63	37
Graphics	37	45	19

From the responses to Question 3 (Table 17) concerning the implementation of I.T. within the organization it would appear that both the data processing manager, and the accountant have high initiatory responsibilities. However, for the development and maintenance of applications, the data-processing manager has a higher profile than the accountant, more particularly in the corporate sector (see Table 11).

TABLE 11
Individual or Area with Responsibility
for Information Technology Applications

Individual/Area	Initiate	Develop	Maintain
	Percentage	Percentage	Percentage
Data Processing Manager	26.3	42.2	44.3
Management Services Manager	10.2	8.7	6.0
Partner	21.6	17.1	14.7
Accountant	24.3	20.4	21.9
Corporate Secretary/Administrator	6.9	3.3	4.2

It is to be hoped that accountants will play a greater role in the implementation of IT as knowledge workers with a greater understanding of the accounting significance of procedures. Not only will accounting needs be better understood, but advice and service to clients on the acquisition of computers and the implementation of IT will also improve. It would appear from responses to the survey that at present the accountant in practice is not being called upon to any extent to provide specialized IT advice. 62% of the respondents in practice stated that they were involved in financial evaluation, and only 32% gave specialist advice relating to IT. The lack of significant specialist involvement of accountants in public practice can be seen in Table 12.

TABLE 12
Extent of Advice Given to Clients
on Hardware and Software

	Percentage
Hardware	
Never	33.0
To a limited extent	71.5
Extensively	12.5
Software	
Never	26.1
To a limited extent	76.1
Extensively	12.5

The fact that between 26 to 33% of accountants in public practice never advise clients on such areas which obviously influence the quality of information on which they will require to comment is disappointing. It also raises the questions as to how much involvement the accountant should have, and what degree of computer literacy is required of an accountant to be able to perform professionally. Song (1985) states that increased productivity and cost reduction are cited in many studies as the main reasons for installing automated office equipment. These findings are repeated in this study, Question 4 (Table 17). When asked to rank the criteria against which their organizations evaluated I.T. proposals, most organizations were move interested in increasing operating efficiency and cost savings, rather than staff reduction and improving working conditions (Table 13).

TABLE 13
Criteria Used to Evaluate Information Technology Proposals (In Rank Order)

Criterion	Rank
Increased Operating Efficiency	1
Cost Savings	2
Improved Information Quality	3
Improving Customer/Client Services	4
Keeping in Line/ahead of competitors	5
Reducing Staff	6
Improving Working Conditions	7
Improved Cash Flow	8

The corporate sector respondents emphasized cost savings and improved information quality whereas the accounting firms respondents placed greater store on increased operating efficiency.

Question 5 (Table 17) attempted to ascertain whether or not the anticipated benefits from the introduction of I.T. Systems and Applications had been achieved. A summarized version of the results is found in Tables 14(a) and (b). Estimating the economic benefit of investment in information systems has often had to proceed on the basis of arguments containing a combination of both measurable and non-measurable benefits (Carr 1985). In general, efficiency gains are measurable whereas effectiveness gains are less so.

TABLE 14(a)
Top Five Information Technology Systems Where Anticipated Benefits were Achieved

System	Percentage All	Corporate	Practice
Word Processing	69.5	62.6	73.1
Spreadsheet Modelling	68.6	70.4	74.6
Data Base Systems	57.8	47.7	23.7
Data Retrieval	48.8	46.6	40.0
Graphics	27.5	52.3	20.0

TABLE 14(b)
Top Five Information Technology Applications
Where Anticipated Benefits were Achieved

Application	Percentage All	Corporate	Practice
Financial Statement Presentation	58.1	58.2	69.6
Accounts Production	41.6	53.9	58.6
Financial Modelling	39.5	62.5	65.7
Payroll	37.7	57.8	32.1
Inventory Control	31.4	36.8	30.0

The top systems and applications shown above have been well tested in recent years and it is of little surprise to find them in the top rankings with spread sheet packages etc. sold in high street stores and advertised on television. Likewise it is not surprising to note that the least favoured systems and applications include such innovative ones as electronic diary; electronic filing; electronic conferencing; teleconferencing; as well as incomplete records, and market research none of which reached a 10 percent rating. On examining the areas of statistical significance in question 5, (Table 17) it appears that the corporate sector respondents felt that the anticipated benefits were "very well" met in all instances excepting taxation modelling. The accounting respondents on the other hand felt that this was one area where their expectations were "very well" achieved. It has been suggested that this difference may have arisen due to the practitioner interpreting it as a personal tax question, whereas the corporate sector view it as one of corporate taxes. One must sound a note of caution as regards the use and development of spread sheet packages, and emphasize the need for the user to be fully aware of the strengths and weaknesses. As Davis (1988) stresses there are obvious dangers in using packages in that although the system may be technically efficient it can easily lack crucial accounting features. An attempt was made to ascertain the reasons for any non-achievement and the main contributory factors would appear to be, in both groups, poor initial systems specification, bad implementation of the new system, and user resistance or conflict. The final section of the survey attempted to gain an insight into how accountants see future developments in the field of I.T. in the short term.

TABLE 15
Top Three Information Information Technology Systems
Where Developments are Expected

System	In Next 12 months %	In Next 3 Years %	Not At All %
Data Base Systems	20.1	-	-
Networks	18.6	21.0	47.9
Data Retrieval	15.3	-	-
Executive Workstations	-	18.3	-
Electronic Filing	-	17.4	-
Electronic Conferencing	-	-	22.8

Amongst the most significant developments expected in the next twelve months, the respondents identified data base systems (20%), networks (19%) and data retrieval (15%), whereas they saw little development in electronic switchboard (3%) and electronic filing (5%) (Table 15). Goodfellow (1985) suggested that commercial data bases were being increasingly accepted by accountants and investors and cited the phenomenal growth of catalogued publicly available data bases in the source book Compute Readable Data Bases and this is confirmed by the above responses. When asked about possible developments in the next three years respondents identified networks (21%) executive workstations (18%), and electronic filing (17%). On the other hand 47 percent indicated that they would not at any time be developing networks and 23 percent would not develop electronic conferencing. Gone are the days when support for accountants consisted of pencils and pads, adequate support now includes software and executive workstations, and it is posited that the information centre is a concept that will become key to the whole area of information technology (Davis 1987). The areas of significant difference between the accounting and corporate groups are identified in responses to question 6 (Table 17). Accounting respondents again see great developments in the field of taxation modelling in the next twelve months, whereas corporate respondents considered the emphasis to be in data base systems, data retrieval, electronic mail, and wide area networks during this period. Care must be exercised in interpreting the results to Question 6 in the light of both the response rate and the inherent difficulties of trying to obtain opinions about the future. The skills and attitudes of the individual accountant must play a part in the way that I.T. will be applied both to the accounting function and to the organization as a whole. The remainder of the questionnaire was therefore directed at the expertise and continuing professional education of the accountant as well as trying to identify any significant obstacles to the acceptance and introduction of I.T. On the level of expertise required, Question 7 (Table 17) asked how important it was to have an ability to use I.T. The answers show that over 77% of respondents rank an ability to use Information Technology as being fairly important or essential whereas only 4% saw it as being of little or no importance (Table 16).

TABLE 16
The Importance of an Ability to use
Information Technology in Present Post

Importance	Percentage		
	All	Corporate	Practice
Essential	45.5	52.2	38.1
Fairly Important	31.7	30.0	36.4
Useful	16.8	15.6	17.1
Not Very Important	3.6	1.7	5.2
Of No Importance	0.3	0.5	-
Blank	2.1	-	3.2
	100.0	100.0	100.0

82% of the corporate respondents, however, stated that such an ability was fairly important or essential, compared to 75% of the accounting firms. Looking further at possible future developments there is a need to consider the role of the accounting profession both in the area of professional standards setting and educational requirements.

Respondents were therefore asked in Question 8 (Table 17) about the acceptability of the accounting profession setting and promoting professional standards for the design and reporting of specialty financial reports such as financial models. 68% of the accounting firms respondents were in favour compared to only 42% of the corporate sector respondents. This is an area that is worthy of greater examination if the accountant is to be seen as an information professional rather than continuing purely as an auditor. Published data is going to be probed more deeply than ever before by virtually anyone who uses computers to analyse accounts. New questions are likely to be raised, and new disclosures required (Barron 1984). As Goodfellow (1985) suggests standard setters and regulators will have to examine the nature and consistency of information submitted as public access increases. The traditionally general-purpose financial reporting statement may not be the dominant feature of electronic financial reporting systems in the future, and more emphasis will have to be placed on identifying and satisfying user needs rather than summarizing data. Finally on this question of future developments the survey examined the required competence in I.T. communication techniques at both pre and post-qualification levels. Education and training is one area in which the lead must emerge from the profession. Not only must we consider the skills required by future members of the accounting profession, we must also accept that at present we have members lacking in adequate IT training. Technology is changing so rapidly that the need for continuing professional education in this area is paramount and the professional bodies will have to use both imagination and innovation in attempting to close the gap in knowledge. The student member is to some extent a captive participant, the qualified member however can really only become involved by some form of persuasion. The responses to question 9 (Table 17) show that over 80 percent of the corporate respondents agree that an awareness of IT communication techniques requires pre-qualifying capabilities in systems analysis and design. Whereas 65 percent of accounting firms respondents were in agreement. It would appear that respondents feel there is a need to improve skills at both pre- and post-qualification stages in systems analysis and design; data base theory; and data communication theory.

Conclusions

In considering the overall results of the survey, although there is little doubt that the I.T. revolution is under way, its progress in the accounting function is patchy. This may in part be due to such variables as organizational type and size and this is undoubtedly an aspect to be considered more fully. The accounting profession cannot be viewed as one homogeneous entity, and current employment position does have an effect on how accountants in public practice and the corporate sector view the impact of IT on the profession. The attitude of the respondents in this survey towards the introduction of I.T. would seem to be a fairly positive one. Caution must be exercised in generalizing results beyond the individuals included in the study, which in turn is only a snapshot taken at a moment in time. The responses and experience however can serve as a guide to possible responses from other accountants.

From the perspective of the individual accounting knowledge worker the effect of new technology has been both profound and subtle. Not only has the technology changed so too have the concepts of accounting. Even although measures of attitudes typically poorly predict specific behaviours

TABLE 17

Question	Respondents Public Service Versus Industry/Commerce		Mann-Whitney U-Test	Chi-Square Test
			Significance	Significance
1. Does your organization make use of I.T. facilities?	89	172	.018	.018
Are the facilities owned or rented?	73	158	.000	.000
2. Does your organization make use of the following I.T. applications?				
Accounts Production	45	131	.003	.000
Audit Services	52	79	.011	.000
Fees Ledger	58	63	.002	.000
Financial Statement Presentation	78	153	.024	.000
Inventory Control	22	122	.000	.000
Nominal Ledger	31	78	.0005	.002
Payroll	40	128	.0005	.000
Production Control	20	100	.010	.006
Purchases Ledger	29	115	.0001	.001
Sales Analysis	37	125	.018	.002
Sales Ledger	33	110	.0002	.004
3. Which individual or functional area in your organization has the responsibility to initiate I.T. applications?				
Data Processing Manager	24	98	.002	.007
Accountant	32	63	.050	.012
4. Which of the following criteria does your organization use to evaluate a proposal to implement I.T.?				
Improved Information Quality	72	153	.0131	.002
5. To what extent have the anticipated benefits been met by the introduction of I.T. in the area of:				
Systems				
Data Base Systems	38	113	.021	.024
Facsimile Transfers	10	61	.001	.002
Graphics	15	63	.39	.023
Applications				
Computer Aided Design	7	24	.017	.042
Payroll	28	83	.013	.042
Production Control	10	53	.027	.020
Taxation (compliance & planning)	54	35	.007	.042
Working Paper Generation	44	55	.002	.009
6. In what areas and when would you expect developments in I.T. systems to start or continue in your organization?				
Data Base Systems	58	121	.022	.028
Data Retrieval	36	104	.003	.002
Electronic Mail	44	81	.015	.020
Whole Area Networks	33	58	.002	.016
Taxation Modelling	59	76	.000	.000
7. How important is an ability to use I.T. applications in your present job?	89	172	.036	.097
8. In your opinion should the accounting profession set and promote standards - for the design and reporting of specialty financial reports such as financial models?	82	166	.002	.003
9. Do you agree that an awareness of I.T. communication techniques requires improvement in pre-qualifying capabilities in Systems Analysis and Design?	78	154	.008	.008

we still need to increase our understanding of worker attitudes, and their views concerning technological change, automation, and the development of the necessary skills to achieve I.T proficiency.

From the public practice perspective it would appear that although the large firms will continue to develop their IT systems and services, the smaller practice will be much more exposed with the technology-resistent practices coming under severe competitive pressures. In addition the smaller practice differs significantly from the larger in that many of them have followed the package approach to the development of IT. The limitations dictated by the hardware and software constraints of micro computers and specialized packages must therefore be highlighted in order that users recognize more clearly their capabilities.

Finally as IT tools alter accounting conceptually, the professional institutes as standard setters will be required to identify and satisfy users' information needs. As a result it will become necessary to place greater emphasis on the content of financial statements and less on their form and related procedures.

BIBIOGRAPHY

Bolland, T., Compton, T. and Stephenson, C.,"Diffusion and Use of Micro-Computers Among Small and Medium Sized CPA Firms: An Update", ORSA/TIMS Conference Papers, St. Louis, 1987.

Carr, J.G. Information Technology and the Accountant Grower Publishing Co. (on behalf of CACA) London, 1985.

Carr, J.G. Information Technology and the Accountant - A Comparative Study, Research Report: 8 - Certified Accountant Publications, London, 1987.

Cheney, P. and Dickson, G., "Organizational Characteristics and Information Systems: An Exploratory Investigation" Academy Management Journal, 25(1) 1982, pp. 70-182.

CICA "Meeting the Challenge of Change" Report of CICA Committee on Long-Range Strategic Planning, CICA, Toronto, 1986.

Davis, G.B., "Commentary on Information Systems", Accounting Horizons, March 1987, pp. 75-79.

Davis, G.B., "Commentary on Information Systems: To Buy, Build, or Customize?" Accounting Horizons, March 1988, pp. 101-103.

Form, W. and McMillan, D., "Men, Women and Machines" Sociology of Work and Occupations, 10(2), pp. 147-178.

Goodfellow, J.L., "Financial Reporting at the Speed of Light", CAMagazine, CICA, August 1985.

Gutek, B., Bikson, T. and Makin, D., "Individual and Organizational Consequences of Computer - Based Office Information Technology", Applied Psychology Annual 5, (Ed Oskamp) Sage Publications, London, 1984.

Iacono, S. and Kling, R., Changing Office Technologies and Transformation of Clerical Jobs, Department of Information and Compute Science, University of California, 1985.

Kling, R., The Impacts of Computing on the Work of Managers, Data Analysts and Clerks, Department of Information and Computing Science, University of California, Irvinex WRL 78-64, 1978.

McCosh, A., Management Accounting in the IT Age, Manchester Business School, 1984.

McFarlan, F.W., The Information Systems Research Challenge, Harvard Business School Press, Boston 1984.

Medcof, J., "The Effects of Information Technology Upon Two Jobs", Conference Paper, ASAC Conference Papers, Whistler, B.C. 1986.

Olson, M. and Lucas, H., "The Impact of Office Automation upon the Organization: Some Implications for Research and Practice", Communications of ACM, 25(11) 1982, pp. 838-847.

Renshall, M., "If we don't adapt to I.T. we shall be Extinct", The Accountant, March 21, 1985, pp. 30-31.

Smith, M.J., Cohen, B.G., Stammer, John L. (Jr) and Happ, A., "An Investigation of Health Complaints and Job Stress in Video Display Operators", Human Factors, 23(4) 1981, pp. 387-400.

Song, N., "Moving Into the Office of the Future", CAMagazine CICA, Toronto, August 1985, pp. 40-44.

Strassman, P., Information Payoff: The Transformation of Work in the Electronic Age, Free Press, 1985, New York,

Turner, J., "Computer Mediated Work: The Interplay between Technology and Jobs - Claims representatives in the Social Security Administration",. Communications of the ACM, 27(12) 1984.

Wainman, D., "What's I.T. All About", CAMagazine, August 1986, pp. 34-40.

TRANSFER PRICING FOR COMPUTER SERVICES

by

S.C. Beiner
Department of Accountancy
Faculty of Commerce and Administration
Concordia University
1455 de Maisonneuve Blvd. West
Montréal, Québec, Canada
H3G 1M8

TRANSFER PRICING FOR COMPUTER SERVICES

This paper addresses the issue of internal transfer pricing for computer services. Transfer pricing becomes necessary when there are internal transfers of goods or services and it is required to appraise the separate performance of the divisions involved. In this paper the concepts and principles of transfer pricing as they apply to the computer services in an organization are developed. The practical considerations involved in the allocation and charging of services offered by the computer department to various departments of a decentralized organization are highlighted. Two models are presented for determining the appropriate methods of transfer pricing depending on the environment in which an organization operates. The researcher argues that organizations with an information systems strategy involving a data base environment utilize a two-step pricing (TSP) method whereby fixed costs (data base design and system, hardware expansion, and recurrent maintenance and operations) are allocated as period costs to the individual departments; routine data processing (DP) costs charged to departments as incurred; and as far as decision support systems (DSS) and micro support costs are concerned, it is suggested the central computer department is treated as a profit centre. As such, then, the paper applies the conventional two-step idea of transfer pricing to computer departments and to the data base information system (IS) strategy.

Introduction

Decentralization and transfer pricing remain an important and active research area. Transfer pricing is defined as the value placed upon goods and services transferred internally among the divisions of a decentralized organization. Costs of computer departments are often charged back to user departments. This charging for services from one part of an organization to another is referred to as transfer pricing. The general theory behind transfer pricing is well developed (see Cook, 1955; Dean, 1955; Hirshleifer, 1956, 1957; Singer et al., 1968; Nielsen, 1970; Anthony, Dearden and Bedford, 1984).

Transfer prices serve as controls on the efficiency of intrafirm activities involving resource transfers. Their purpose is to control and also to motivate the manager whose task is to optimize the resources. Establishment of a transfer pricing system requires extensive information, some of it outside the firm (Drury and Bates, 1979).

Application of Transfer Pricing to Computer Services

Consider the example concerning the use of computer services of a decentralized organization by the different operating divisions. The data processing industry is nowadays highly regimented. If computer services are furnished without charge, users have no inhibition about asking for all the special runs, sophisticated analyses, and other services that they can get.

They may even use an expensive computer for work that could be done as well on a typewriter. Assignment of computer time is the responsibility of the manager of the computer centre, and such assignments are made according to the manager's perception of needs (or according to friendship with users). The manager has no financial incentive to provide high-quality computer services in a cost-effective manner. On the other hand, if the computer centre is set up as a profit centre, all these conditions change. Users are motivated to think about whether possible uses of the computer are worth their cost, and they weigh the value of computer services against other possible uses of the funds made available to them. The manager of the computer centre must now offer quality services at competitive prices, or users will be motivated to seek computer services elsewhere.

Charging for Computer Services

Charging for internal computer services supplied by internal data processing divisions has received substantial attention in the past (Chan and Lam, 1986; Dearden and Nolan, 1973; Drury and Bates, 1979; Nolan, 1977; Singer, 1968). These discussions, however, predate two major changes in the role of data processing (DP) in large corporations over the past decade, namely:

1. The use of information systems strategy as a competitive weapon (Benke and Caster, 1983; Triganx, 1980). This entails the recognition of data as a 'corporate asset' which is maintained as a set of central computer databases on large mainframes, which serve both routine DP needs and as a source of information for individual departments/divisions decision support. Most DSS information will be accessed online. Routine DP transactions will normally also be handled online though there may be some scope for deferring the updating of the related accounts to off peak periods, e.g. overnight. Typical volumes of database transactions will now be in the range 100,000 to 2,000,000 per day in larger organizations.

2. The advent of microcomputers that can be purchased on the departmental budgets for the use of individual executives for personal decision support (Van Lear, 1977). These can operate quite independently of the organization's mainframe systems. However, used in this way, the resources of the central databases are not available for decision support. Therefore, such systems are increasingly being used in conjunction with mainframes. The notion of data as a corporate asset is made concrete by allowing executives to download data from these databases to their own system for further processing. This type of usage is now the norm in large corporations.

The Costs of The Modern Computer System

The older type of computer system to which the previous charging literature refers had markedly different characteristics to that just described. As a first approximation applications belonged to departments, e.g. receivables accounting to sales. Furthermore, both systems analysis and design,

programming and other front-end costs could be tied back to that application as could the costs of day-to-day processing. Therefore, if the organization desired, it could treat the computer division like an external computer bureau, which could operate as a profit centre. Furthermore, since the majority of processing was on a batch basis, it was perfectly feasible for individual departments to use such external suppliers, if they wished.

The modern database-oriented environment is very different. Data no longer serve the needs of individual departments. Sales accounting data, for example, may now also be used by marketing, for general ledger purposes, in conjunction with warranty claims, etc. Stock availabilities that were once the sole concern of the warehouse area are now an indispensable item of information in order processing.

Just as data no longer belong to a single application, neither do many of the costs. This is true, for instance, of what is now likely to be one of the single largest costs, for example, the setting up and maintenance of the central databases. For our present discussion, the key components of this latter cost are those concerned with maintaining the integrity of the databases, i.e.: (i) the cost of producing back-up copies and logging individual transactions, so that the database can be reconstituted in case of system failure, (ii) the operation of a comprehensive set of validation checks and other controls designed to ensure that incorrect data are not entered onto the databases; that if this happens, they are corrected; and that existing data is not used illicitly or corrupted in some way. A third significant cost is that of 'tuning' the database so as to maintain efficient performance.

The modern computer system has a very different range of costs compared to systems of 10-15 years ago. The major ones are identified below on the basis of whether they are one-off or recurrent and by whether they are incurred centrally or by departments.

Environment

Before we deal with the techniques available for working out the transfer pricing arrangements, we need to know the environment in which the computer centre operates. Is the objective of the organization within which it operates to maximize profits, to minimize costs, or perhaps to provide the necessary level of services? On the other hand, the relationship between the supply and demand for the computer service may affect the selection of the transfer pricing method to be employed by the computer centre.

For any organization, the method and the selection of the specific transfer pricing technique depends largely on the relationship between the supply and demand conditions in the organization.

Computer Centre As a Service Centre

If there is no outside market for the transferred service and if the supplying division can meet all probable requirements, Solomons (1965) recom-

mends that the supplying organization function as a service centre and that transfers take place at standard variable cost. Fixed costs (including the cost of capital) are to be charged to the user divisions/departments on a budgeted, period cost schedule and allocated among users on the basis of the relative budgeted demands they place on the service centre. An important point to consider in this situation is the presumption that demand for the computer service will not exceed supply. Anthony, Dearden and Bedford (1984) also offer the alternative of standard variable cost in addition to a share of the fixed costs. Sharpe (1969) suggests that if the demand were less than the supply, the unit charge should be zero on the basis that marginal costs are zero, and that fixed costs should be charged on a fixed fee, period cost basis. These schemes may be categorized as two-step pricing, consisting of a fixed fee to cover fixed costs and a variable charge, which may be zero, based on usage.

Smidt (1968) recognizes that in an operating cycle, queues are likely to develop during interim periods of peak demand. He proposes a flexible pricing scheme that allows the buyer a choice of fast turnaround at a premium price, or a lesser priority at a reduced price.

If no outside market exists for the transferred service, and if the service centre does not have the capacity to meet all requirements, the two-step pricing technique described above may continue in use but it loses its utility as a means of allocating resources. To fill this need, pending an expansion in capacity the use of mathematical programming techniques is proposed by an appropriate corporate department, by which method the optimal distribution of the input services may be assigned. Effectively, this strategy constitutes a decentralization of the decision-making function.

This service centre model contrasts with the profit centre model discussed below in two basic respects. First, the use of the profit centre model assumes that the view of the buyer's decisions is in the best interest of the corporation. In the service centre model, where a steering committee is often employed, that assumption no longer holds. The steering committee assumes responsibility for assuring that the decisions made are best for the corporation. Second, the profit centre model contains an underlying corollary calling for a high degree of sophistication on the part of the buyers. In the service centre, this requirement may be relaxed, though not eliminated. That there is only one source of computer service obviates the need to articulate data processing proposals in a manner suitable for competitive bidding and subsequently for evaluating the bids in a competitive manner.

Computer Centre As a Profit Centre

To be defined as a profit centre, the computer resource must be operated side-by-side with an outside competitive market, and user/managers must be free to resort to that market to meet the computer requirements that they have independently decided to obtain. However transfer prices may be calculated, they should be subject to the competitive pressures of the outside market. Within those constraints, the computer resource manager is expected to promote

and develop his/her own market to the point at which profit is earned. Investment and divestment hardware decisions are made in response to the actual and forecasted demands of its market.

The profit centre model is seen as a workable means of obtaining effective and efficient use of the computer and, in the long run, of determining how much the corporation should spend on computing. The availability of a competitive external market is required for such a model to function properly. Decisions concerning computer applications are fully decentralized to consumers on the assumption that the sum of their decisions equals what is best for the corporation.

Selection of an Appropriate Transfer Pricing Technique

Based on the environment, two models are proposed. These are arranged in order of the degree of user sophistication required and are displayed in the following table.

EXHIBIT 1

Computer Resource Model

Characteristics of the Environment	Model - 1	Model - 2
Management objectives	Cost minimization Profit maximization	Satisfies Goal congruence
Decision makers Who makes major application decisions?	Steering Committee/ Top Management	Users
Organizational design	Moderate sophistication Partial decentralization	High sophistication Full decentralization
Organizational structure of the computer resource	Service Centre	Profit Centre
Appropriate transfer pricing technique	Two-step	Competitive Market - per job or batch - per transaction - per time of resource

Specific Charging Techniques

Where a computer service is a separate division, prevailing market prices are used for charging user divisions. When the computer is in the same division, the basis is cost rather than market price. Realistically, a computer centre which serves mostly the internal users will not be competitive with outside computer service bureaus. They have a monopolistic situation and internal users would probably be compelled by the parent company to use the internal services. The price for such a monopolistic situation should be determined using the marginal cost approach, taking into consideration the capacity of the computer.

Charging for Systems Development

Systems development work is charged when that effort is performed by a central systems development department. If systems development is performed by the user/manager, as is usually done in decentralized situations, the issue of charging does not arise. Charging for such work is advisable since it tends to force an evaluation of the costs, both operating and development, against the expected benefits of any given system. If development costs are minimal in relation to operating costs, they may be included in with the operating charges. Otherwise, the development costs are customarily charged on a "time and materials" basis against the current operating budgets of the user/manager. The latter method can have dysfunctional effects because it is likely to "distort" [user/manager] decisions on whether, and when, to initiate major system projects...capitalization will generally be a more appropriate treatment (Bernard, 1977).

Charging for Maintenance

The cost of maintenance should be covered by the computer centre, on the grounds that the cost-driving factors such as the quality of the original programming and testing are controllable by that department. Alternatively, a fixed maintenance charge be made for each system with the variance between the charge and actual cost being borne by the computer facility (see Bernard, 1977).

To give a rough idea of the relative orders of magnitude involved, a typical microcomputer, along with the necessary ancillary hardware and software might cost around $5000. The purchase price of a single large mainframe with associated hardware to run the central databases (and system reliability considerations usually dictate that at least two mainframes be used) would be well over $ 1m. The annual software rental and associated costs would similarly run to $10,000. The central DP staff would probably be several dozen in number, at least. Many departments will probably not need the services of a full time analyst/programmer. Though certain costs will be incurred in running the micros, including hardware maintenance, these are likely to be of the order of $1000 per year.

The other recurrent costs associated with departments for routine DP carried out by the central service are, of course, likely to be mainly for stationery and associated activities such as envelope stuffing.

The Traditional Bases For Computer Charging

One traditional way of determining transfer prices is to allow the computer department to operate as a profit centre. Since it is not consistent with an information system strategy involving a database environment, (because it is no longer possible to allow departments to utilize outside suppliers for their routine DP services), this is no longer a viable mode of transfer pricing on its own.

Many organizations, however, never adopted a profit centre framework because, even 15 years ago, it appeared unrealistic. The recommended alternative was a service centre operation involving some form of two-step pricing approach, with budgeted fixed costs + standard variable costs being the most common form. A variant on this (favoured by many public organizations) was to have different standard variable costs corresponding to peak and off-peak usage.

A Suggested Charging Scheme

The author suggests a new approach to transfer pricing which is more appropriate to current operating conditions. Essentially, this involves a combination of the two traditional bases for charging. If the database environment precludes the sole use of a profit centre approach, the existence of substantial computing power in departments makes it possible to consider dealing with individual department needs for DSS applications in just that way.

EXHIBIT 2

Computer Resource Costs

Nature of the Cost	On/Off	Recurrent
Central	Analysis, specification and design of individual databases and associated transaction processing software Hardware expansion costs	Maintenance of databases Central operations systems analysis, design and programming staff Hardware maintenance software support from vendors Overhead costs
Departmental	Cost of setting up (design and programming) DSS not constructed by individual executives Cost of individual micro/mainframe links Costs of micros for departmental use Costs of individual micro software	Costs of routine DP e.g. Purchase Order system --- Micro running costs

Two-Step Pricing

Two-Step Pricing

Computer Centre operates a profit centre i.e. tenders just like any other contractor

Computer Centre operates as a profit centre (market-based prices)

Accordingly, the proposed system is this:

1. Central system costs are apportioned to individual departments on a two-step basis. Thus, all budgeted costs in the first row, i.e. quadrants 1 and 2, of Exhibit 2 are allocated as period costs to individual departments. The routine DP costs of departments, i.e. those routine costs shown in the fourth quadrant of Exhibit 2 that are incurred by the

central service in carrying out routine DP for those departments are charged directly to the department.

2. Decisions to invest in new hardware centrally are treated just like any other capital investment decision in the context of overall strategy. Such costs are capitalized and translated into a period charge on the central computer department.

3. Microcomputer investment decisions are the responsibility of individual departments and borne directly by them. (In practical terms these costs will usually be well below the limits for departmental sanction). The central computer department can operate as a micro supplier to departments on a profit centre basis.

4. As far as departmental DSS and micro maintenance and running costs are concerned, the central computer service should conceptually operate as a profit centre. It is perfectly feasible for departments to employ their own staff or use outside contractors for these purposes and a vigorous external market exists.

A sound transfer pricing system will provide several benefits - 1. it makes management aware of the uses of this information in controlling each element within the DP environment; 2. it provides for an equal sharing of DP expense by all users; 3. it assists in the proper allocation of DP resources; 4. it provides a method of prioritizing user requested services; 5. it identifies and helps control total DP costs and 6. it provides detailed information which can be used in determining product-line profitability.

Criteria for Charging Techniques

The choice of a decentralized decision-making scheme is one of the most important issues confronting systems designers in general and management accountants in particular. Certain criteria must be met if charging techniques are to be useful in constructively influencing the behaviour of users. Nolan (1976) sets forth four such criteria:

Understandability: If the user/manager is to make rational economic choices concerning computer usage, he must understand the elements of cost and how they relate to his activities and the functions being performed.

Controllability: The charges should be reported to the user/manager in such a way that he recognizes those cost elements that he can control.

Accountability: The user/manager should be held accountable for the costs of his/her computer usage since these costs are being included in his/her performance report and review.

Cost/benefit incidence: Charges should be so invoiced that managers can associate the specific cost with the benefit contained from the specific task performed by the computer.

Three issues remain. First, on what basis should the budgeted period costs be apportioned? Though all departments benefit from the existence of central databases, they do not do so to an equal extent. Deciding a "fair" basis for such apportionment is, conceptually, no different to other service overhead allocation problems.

The second problem is to determine the allocation of standard variable costs of routine DP to departments. In the main, these are fairly readily tied back to particular departments and should not pose any particular problem.

The third issue is the extent to which it is worth considering the introduction of a variety of tariffs for standard variable costs depending on overall machine usage. If there is scope to move a substantial fraction of machine usage from online to off peak batch processing, this is likely to be attractive, though it must be remembered that any database operation generates a substantial off peak load for the maintenance of the databases. If such a scheme is attractive then a linear programming shadow cost approach is probably the best way of defining the transfer price.

Concluding Remarks

The practice of charging decentralized corporate users of in-house computer services has become recognized as an important element in the utilization and management of the computer resource. The selection of the appropriate transfer pricing method for computer services is of utmost importance in order to facilitate effective utilization of the computer services by the users and in the performance evaluation of the computer centre. However, whatever method of transfer pricing is to be adopted should be understandable to the users.

References

Abdel-khalik, A. Rashad and Edward J. Lusk, "Transfer Pricing: A Synthesis", The Accounting Review, 49 (January 1974), pp. 8-23.

Anthony, Robert N., John L. Dearden and Norton M. Bedford, Management Control Systems, Fifth Edition, Homewood, Illinois: Richard D. Irwin Inc., 1984.

Benke, Ralph L. Jr. and Bruce Caster, "Information Systems and Fixed Costs in Multidivisional Companies", Cost and Management, 57 (March/April 1983), pp. 21-25.

Bernard, P.E., Charging for Computer Services: Principles and Guidelines, New York: PBI Books, 1977.

Chan, K. Hung and Shui F. Lam, "Transfer Pricing for Computer Services in Public Utilities", (July 1986).

Cook, Paul W. Jr., "Decentralization and the Transfer-Price Problem", Journal of Business, 28 (March 1955), pp. 84-97.

Dean, Joel, "Decentralization and Intra-company Pricing", Harvard Business Review, 33 (July-August 1955), pp. 65-74.

Dearden, John, "Interdivisional Pricing", Harvard Business Review, 38 (January-February 1960), pp. 117-125.

Dearden John and Richard L. Nolan, "How to Control the Computer Resource", Harvard Business Review, 51 (November-December 1973), pp. 68-78.

Diehr, Della M., "Putting a Price on EDP Services", Journal of Systems Management, 26 (March 1975), pp. 16-19.

Drury, D.H. and J.E. Bates, Data Processing Chargeback Systems: Theory and Practice, Hamilton, Ontario: The Society of Management Accountants of Canada, 1979.

Grillos, John M., "Pricing EDP Resources", Computer Decision, 6 (November 1974), pp. 16-17.

Hirshleifer, Jack, "Economics of the Divisionalized Firm", Journal of Business, 30 (April 1957), pp. 96-108.

_____, "On the Economics of Transfer Pricing", Journal of Business, (July 1956), pp. 172-184.

Neilsen, Norman R., "The Allocation of Resources: Is Pricing the Answer?", Communication of the ACM, August 1970.

Nolan, Richard L., Management Accounting and Control of Data Processing, Lexington, Massachusetts: D.P. Management Corporation, 1976.

_____, "Controlling the Costs of Data Services", Harvard Business Review, 55, (July-August 1977), pp. 114-124.

Owens, Robert W., "Pricing Goods and Services of an Internal Service Department", Government Accountants Journal, 30 (Spring 1981), pp. 43-46.

Sharpe, William F., The Economics of Computers, New York: Columbia University Press, 1969.

Singer, Neil H., Herchel Kanter, and Arnold Moore, "Prices and the Allocation of Computer Time", Proceedings of the AFIPS Fall Joint Computer Conference, 1968.

Singer, Neil H., Herchel Kanter and Arnold Moore, "The Allocation of Computer Time by University Computer Centres", Journal of Business, 41 (July 1968), pp. 375-384.

Smidt, Seymor, "Flexible Pricing of Computer Services", Management Science, 14 (June 1968), pp. B-581 - B-600.

Solomons, David, Divisional Performance Measurement and Control, New York: Financial Executives Research Foundation, 1965.

Triganx, Robert, "Mainframe Capacity Management Optimizes User Service, Utilization", Bank Systems and Equipment, 17 (August 1980), pp. 43-48.

Van Lear, David M., "DP Service Area's Pricing Transfers Expenses to Users", Bank Systems and Equipment, 14 (September 1977), pp. 64-67.

ACCOUNTING FOR INVESTMENT GAINS/LOSSES BY LIFE INSURANCE COMPANIES[1]

by

Morton Nelson, PhD, CA, CMA
Associate Professor
School of Business and Economics
Wilfrid Laurier University, Waterloo, Canada

Abstract. This paper examines the method by which life insurance companies recognize trading gains/losses in their fixed-term and equity portfolio investments. It compares the realized, market value and recognized trading gains/losses for the years 1981 to 1986 inclusive of a sample of fourteen Canadian life insurance companies. The paper suggests that the current method of recognition excessively smooths reported income and proposes an alternative.

Introduction

In July, 1986 the Accounting Standards Committee (AcSC) of the CICA issued the "Portfolio Investments" Exposure Draft (PI-ED). It identified three types of portfolio investments each having a different accounting method for recognizing gains and losses. In January, 1987 the AcSC issued the "Life Insurance Enterprises" Exposure Draft (LI-ED) to bring the life insurance industry into compliance with GAAP accounting as prescibed by the CICA Handbook.[2]

The connection between the two Exposure Drafts is not apparent until one more closely examines the second type of portfolio investment described in the LI-ED; namely, "Portfolio investments held primarily for the purpose of satisfying specific long-term obligations, the measure of which is related to the method of valuing the investments:".[3] Equity shares and fixed-

---

[1] The author gratefully acknowledges the assistance of the life insurance companies who graciously provided the data necessary for this paper.

[2] The Exposure Draft on Portfolio Investments has since been allowed to lapse and no further work on this topic is anticipated in the near future. The Life Insurance Enterprise Exposure Draft has been adopted as Section 4210 of the CICA Handbook.

[3] CICA Exposure Draft, "Portfolio Investments", (July 1986) paragraph .17

term securities held by the life insurance companies fall into this category.

The purposes of this paper are (1)to explore the method of accounting for portfolio investments (in particular, equity and fixed-term securities) used by the life insurance industry, (2)to compare it to current and proposed GAAP and (3)to compare the amount of income (i.e., trading gains and losses) recognized under the current and two alternative methods. The paper considers only investments in fixed income and equity securities which are not subject to significant influence by the investor.[4]

Background

Current GAAP require that gains and losses generally be recognized only when realized, unless an impairment occurs, at which point the investment is written down and the loss is recognized. The Portfolio Investment Exposure Draft retains this aspect of GAAP for most investors[5].

On the other hand, "Portfolio investments held primarily for the direct beneficial interests of the participants..."[6] (i.e. mutual funds) should be accounted for at market values and unrealized gains and losses included in income in the current period. This position most closely agrees with that of Hicks, Edwards and Bell, Chambers, and Sterling, among others, who have suggested the appropriateness of market value accounting.

The portfolios of the life insurance companies fall into the category of those portfolios "held primarily for the purpose of satisfying specific long-term obligations, the measurement of which is related to the method of valuing the investments"[7]. The PI-ED stipulates that the equity investments be carried on the balance sheet on a moving average market (MAM) basis and, that the gains and losses (realized and unrealized) be recognized in income on the same moving average market basis. Fixed-term portfolio investments, according to the PI-ED, should be carried on the balance sheet at amortized cost and gains and losses arising on sales amortized to income over the remaining term to maturity of the investments sold.

---

[4] Interest and dividends received from portfolio investments are taken into income generally as received. As such, they are not considered in this study.

[5] IBID, paragraphs .41 - .44

[6] IBID, paragraph .19

[7] IBID, paragraph .23

The current method used by life insurance companies to account for equity investments is to:

i) determine the difference between the book (cost) and market values of the portfolio as of the balance sheet date (A);

ii) determine the net realized capital gains (losses) due to sales of securities during the period (B);

iii) recognize 15% (7% prior to 1984) of A + B as income for the period, with the remainder recognized in future years at 15% on a declining balance basis.

The balance of the unrecognized realized and unrealized gains (losses) is added to the cost of the portfolio for balance sheet presentation purposes and, becomes the opening balance for the following year's determination of the gains (losses) to be recognized. The overall effect of the method is to recognize both realized and unrealized gains (losses) on equity investments on a 15% declining balance basis.

Current practice in the life insurance industry generally is to amortize gains and losses realized on the sale of fixed term portfolio investments over the lesser of the remaining term to maturity of the assets sold or 20 years. The unamortized gain or loss is added to the cost of the securities for balance sheet presentation purposes.[8] Unrealized gains and losses on fixed term investments are not accounted for.

One of the more frequent criticisms[9] levelled against the Portfolio Investment Exposure Draft by the respondents was that it was simply legislating into a proposed standard the current practice in the life insurance industry without establishing a strong conceptual argument for the suggested method. That is, the practice of smoothing the trading gains and losses was not sufficiently justified as a theoretical alternative within the traditional accounting model. This criticism was particularly evident from the academic respondents who mostly advocated the use of market values.

A rationale for the method of income recognition of the portfolio investments of insurance companies is included in a

---

[8] Therefore, a realized but unamortized portion of trading losses is carried on the balance sheet as an asset.

[9] Letters received by the Accounting Standard Committee in response to the Portfolio Investment Exposure Draft.

report produced in 1982 by the CICA and the CIA (Canadian Institute of Actuaries).[10] The report explains that:

> ...all investments by a life insurance company are held to fulfil a long-term investment strategy... regardless of the intended or actual holding period for a particular investment. In keeping with the above objective of investment management, individual securities in the portfolio may be bought and sold, and the composition of the portfolio...may change over time. At any point in time, however, the market value of individual securities or of the portfolio in total is of secondary importance to the long-term rate of return because the company is not compelled to sell securities at depressed prices, provided that the nature of the assets continues to be appropriate to support the related liabilities.
>
> We (the Joint Task Force) believe that investment income measurement in a life insurance company should reflect an appropriate share of cash income, amortization of premium or discount for fixed income securities and capital appreciation or depreciation for equity securities, whether or not the asset has been traded. At the same time, undue recognition should not be given to random short-term changes in market values. These principles are particularly important in a life insurance company to achieve equitable income recognition and thus fair treatment of policyholders year by year.[11]

The Report, as well as the accounting community, appear to have accepted, by and large, the suggested method of accounting for fixed income securities by life insurers, i.e. the deferral and amortization of realized gains and losses. This method neutralizes the effect on income between holding and trading a security. "Generally there is little change in investment yield between the security traded and the security replacing it except for any change in quality and duration to maturity."[12] The Report seems to suggest the hypothesis that the insurance companies are relatively indifferent as between holding and trading fixed term securities. This point will be explored further below.

---

[10] "Report of the CICA/CIA Joint Task Force on Generally Accepted Accounting Principles for Life Insurance Companies", December, 1982

[11] IBID, page 6

[12] IBID, page 8

The Report suggested that the income recognition method for equity securities should allow an appropriate share of cash return and capital appreciation to be recognized in income each year, and should not influence the decision to purchase, sell or replace invested assets or the timing of such decisions. It was concluded that some form of moving average formula would accomplish these objectives. Using market indices, the Task Force decided that the 7% declining balance rate recognized the gains and losses on equity securities too slowly[13]. Presumably, influenced by the Task Force report, the Superintendant changed the amortization rate to 15% effective in 1984.

Trading gains and losses on fixed income securities continue to be amortized over the remaining term to maturity of the securities sold. This practice results in significant unrecognized amounts being carried on the balance sheet with respect to these investments.

Methodology

Upon examining a copy of an INS54, the set of financial information which life insurance companies must file annually with the Department of Insurance, the researcher determined that sufficient information was contained therein for the purpose of comparing the effects of the various methods of income recognition. Letters were sent to the 35 largest life insurers in Canada requesting copies of their INS54's[14] or copies of the relevant schedules therefrom for the years 1980 to 1986 inclusive. 1980 was included only so that the opening balances for 1981 would be available. Thus, the usable information for comparative purposes runs from 1981.

A total of sixteen companies responded for an overall response rate of 46%. Two of the companies would not provide the needed information with the result that only fourteen companies are included in the summaries. However, these fourteen companies command 83.3% of the total assets of the largest 25 life insurers[15] and include 9 of the largest 10 life insurers in Canada.

---

[13] The gains were being amortized too slowly because the unamortized balances were accumulating over time and were not being transferred into the income statements.

[14] Unfortunately, the office of the Superintendant of Insurance would not provide copies of the INS54 without the permission of the companies. Therefore, it was somewhat easier to ask the companies directly.

[15] Source: The Financial Post 500, Maclean Hunter Limited, Toronto, 1987.

It would appear, therefore, that the data received fairly represent the industry.

The information gathered and summarized included the following for both the equity and fixed term portfolio investments of each respondent:[16]

a) book balance, i.e. cost (excluding unrecognized gains and losses) as of December 31;
b) market value as of December 31;
c) trading gains/losses recognized for the year;
d) actual (realized) trading gains/losses for the year; and,
e) from the above information the gains/losses for the year which were derived assuming the company had been using market values to recognize portfolio income.[17]

The letter requesting the information from the life insurance companies promised that the individual companies would remain anonymous[18]. Therefore, companies are identified by a letter designation and much of the data which could be attributed to a particular company is aggregated. Nevertheless, the sum is representative of the parts.

Equity investment results

Table 1 summarizes the gains/losses of all fourteen companies for the six years from 1981 to 1986. The actual trading gains fluctuate somewhat from year to year but are all positive and total $2.44 billion. (See Tables 1 & 2.)

As might be expected, the market gains are more volatile with losses occuring in 1981 and 1984. Total net gains amount to $3.09 billion or 126% of actual net trading gains. The total gains recognized by the companies increase relatively evenly and gradually over the six years and amount to $1.73 billion or 71% of the actual gains. The somewhat larger proportion of recognized gains in the latter three years as opposed to the earlier three years results from the formula being adjusted, in 1984, to 15% from 7% of realized and unrealized gains/losses.

---

[16] The first four items were obtained directly from the INS54.

[17] See Appendix A for an explanation of how this figure was determined.

[18] Several companies emphasized their desire to remain anonymous in the letter which accompanied their data.

The comparative volatility of the three methods for income recognition is more readily apparent in Illustration 1. The current recognition method produces a line which rises gradually from year to year and successfully smooths the market fluctuations. (See Illustration 1.)

The total investment (at cost) in equity securities by the thirteen responding companies increased from $2.8 billion as at December 31, 1980, to $5.86 billion at December 31, 1986 for a simple average investment of $4.3 billion over the six-year period (see Table 2). The indicated average annual rates of return for the three recognition methods may be calculated as:

actual gains	9.5%
market value gains	12.0%
recognized gains	6.7%.

Table 3 presents the gains/losses of the responding companies according to the method of determination. One particularly interesting observation is Company H which completely divested its equity portfolio in 1985 thus realizing all gains or losses. However, the company still carries $20.8 million of unrecognized gains on its books as of the end of 1986[19]. Company H reinvested in equity securities during 1986 and had a balance of $9.1 million as of December 31. Although this example may be unusual, it does reveal an interesting phenomenon whereby the unrealized gains could far exceed the cost (and market value of $9.3 million) of the equity portfolio. (See Table 3.)

Fixed term investment results

Table 4 summarizes the gains/losses on fixed term portfolio investments (bonds) from 1981 to 1986. The actual trading gains increased significantly in 1985 and 1986 as interest rates fell and totalled $1.3 billion for the six year period. (See Tables 3 & 4.)

Market based results are quite volatile with losses occurring in 1981 and 1984, and dramatic peaks in 1982, 1985 and 1986. Total market based gains amounted to $4.3 billion. Recognized gains/losses moved steadily from a loss of $50.8 million in 1981 to a gain of $105.6 million in 1986. However, the net gains recognized over the six years amounted to an overall loss of $1.5 million. This difference between the amounts recognized and the other two bases is readily apparent in Illustration 2.

---

[19] Unfortunately, not all companies provided full statements so that this figure was not generally available.

The total investment in fixed term securities by the fourteen responding companies almost trebled from $11.0 billion at the end of 1980, to $28.9 billion at the end of 1986 for a simple average of $20 billion over the six-year period (see Table 5). As above, the indicated average rates of return for the three recognition methods may be calculated as:

actual gains	1.1%
market value gains	3.6%
recognized gains	0.0%.

The gains and losses for the bond portfolios of the responding companies is presented in Table 6. Graphically, the curves for the individual companies are relatively similar to the curves in Illustration 2 with most companies reporting little or no trading gains on their bond portfolios over the six-year period.

The reporting problem

Boyle (1985) developed the implications of recognizing gains in equity portfolios under a Moving Average Method (MAM) and a Declining Balance Method (DCM). His purpose was to determine the speed of recognition under various conditions assuming the desirability of smoothing. The formulas and the analyses were "based on a static fixed portfolio of equities"[20] and the gains and losses were derived from changes in the TSE 300 index or similar such data. Therefore, the analysis did not include any data with respect to actual trading activity.

The data developed in this paper show that the rates of return do not necessarily follow a smooth path nor are they consistent from company to company. The yearly return on equities uses the average of the opening and closing market values of the portfolio as the denominator. The TSE 300 figures were taken from "The Toronto Stock Exchange 300 Indexes Manual", 1987 and the yields of Canadian bonds were obtained from the "Bank of Canada Review", March 1987.[21]

Illustration 3 indicates that the rate of return on equities of the TSE 300 composite index is more volatile than any of the three methods examined in this paper. The market value method for recognizing trading gains on bonds results in much greater volatility than any other method (see Ilustration 4). The actual trading gains/ losses most closely parallels the proportionate

---

[20] Boyle (1985), p. 130

[21] The bond "yield" is determined by calculating the ratio of price change from December 31 of the current year to December 31 of the following year.

change in market prices of Canada bonds. (See Illustrations 3 & 4.)

The differences in the patterns of recognition of trading gains and losses for the portfolios of life insurance companies leads to the problem of the appropriateness of the various recognition methods examined. It also follows that the reporting objectives will affect the propriety of the method.

Conclusion

If one accepts the conclusions of the Joint Task Force that "undue recognition should not be given to random short-term changes in market values"[22] then the current method of deferral and recognition over a relatively lengthy period appears appropriate. The Superintendent of Insurance, who has as one of his primary objectives, the protection of the policyholders from fiduciary risk, is also in favour of deferring trading gains/losses to reduce the payout and the demand for payout of profits in the form of both policyholder and shareholder dividends.

A second argument put forward is that the slow recognition of trading gains/losses enhances policyholder and shareholder confidence in the company in question. Certainly a long steady growth in income during volatile market fluctuations would Give the appearance of fiscal responsibility and stability. However, reporting artificially dampened fluctuations may have only dubious advantages from a policyholder's or shareholder's viewpoint particularly when attempting to choose between companies.

A third argument made is that the fixed term portfolios are held in order to satisfy the long-term actuarial liabilities of life insurance companies. This argument would have more credibility if were not for the fact that in examining the INS54's we find that many insurance companies traded up to 75% of their fixed-term portfolios per year. If these securities were being held primarily to satisfy a particular long-term liability, one could reasonably expect that the securities would not be traded. However, given that the securities are traded in order to secure a relative advantage, one could reasonably expect that the results of the trading activity should be recognized particularly, as the data show, with the large differences between the actual gains/losses realized and the amounts which have been recognized in the income statements (see Table 4).

Upon examining the data and considering the outlined alternative methods of recognition, we would advocate a faster recognition of equity and fixed portfolio trading gains/losses

---

[22] op. cit., page 6

for life insurance companies. While we have a predilection for the market value method, we recognize that the adoption of this method may cause severe fluctuations in gains and losses some of which, in fact, may never be realized. Similarly, recognizing actual gains and losses only, allows for manipulation of results from year to year should management(s) be so inclined.

Therefore, as a compromising, and perhaps temporary, solution we would advocate that portfolio net gains/losses be deferred and recognized, straight-line, over a three year period. This recognition period is significantly shorter than the current method for equity securities and particularly for fixed-term securities. The shorter recognition period should enable statement users better to distinguish the abilities of portfolio managers to take advantage of market fluctuations while smoothing the more violent fluctuations in market values. At the same time the market values of the portfolios should be disclosed in the notes to the financial statements in order for the users to make additional comparisons. After the industry and users have had time to digest this change, it may then be possible to move to the market value method.

Bibliography

"Bank of Canada Review", (Ottawa: March 1987)

Boyle, Phelim P., "Accounting for Investments of Life Insurance Companies", Contemporary Accounting Research, (Spring 1985) pp. 116-144

----- "Options: A Monte Carlo Approach", Journal of Financial Economics, (4, 1977) pp. 323-338

CICA Accounting Standards Committee Exposure Draft, "Portfolio Investments", July 1986

CICA, "Report of the CICA/CIA Joint Task Force on Generally Accepted Accounting Principles for Life Insurance Companies", December 1982

____ Accounting for Portfolio Investments, (Toronto: 1984)

Gray, William H., "Why the 'Deferral and Amortization' Method: A Case Study", CA Magazine, (April 1976) pp. 52-53

Maclean Hunter Ltd., "The Financial Post 500", (Toronto: 1987)

Table 1 EQUITIES Total Gains All Companies ($Millions)

Year	1981	1982	1983	1984	1985	1986	Tot 6 yrs
Actual	260.3	167.4	539.7	165.2	584.6	723.7	2,440.8
Market	(269.6)	231.4	1,079.0	(54.1)	1,055.1	1,051.9	3,093.7
Recgnzd	95.0	111.8	174.0	353.4	447.8	546.9	1,728.8

Table 4 BONDS Total Gains All Companies ($Millions)

Year	1981	1982	1983	1984	1985	1986	Tot 6 yrs
Actual	(315.6)	27.3	185.7	(123.5)	581.5	943.9	1,299.3
Market	(557.4)	1,468.0	391.2	(26.6)	1,674.7	1,389.9	4,339.8
Recgnzd	(50.9)	(43.7)	(20.7)	(14.6)	22.9	105.4	(1.5)

Illustration 1: EQUITIES

Total Gains All Companies

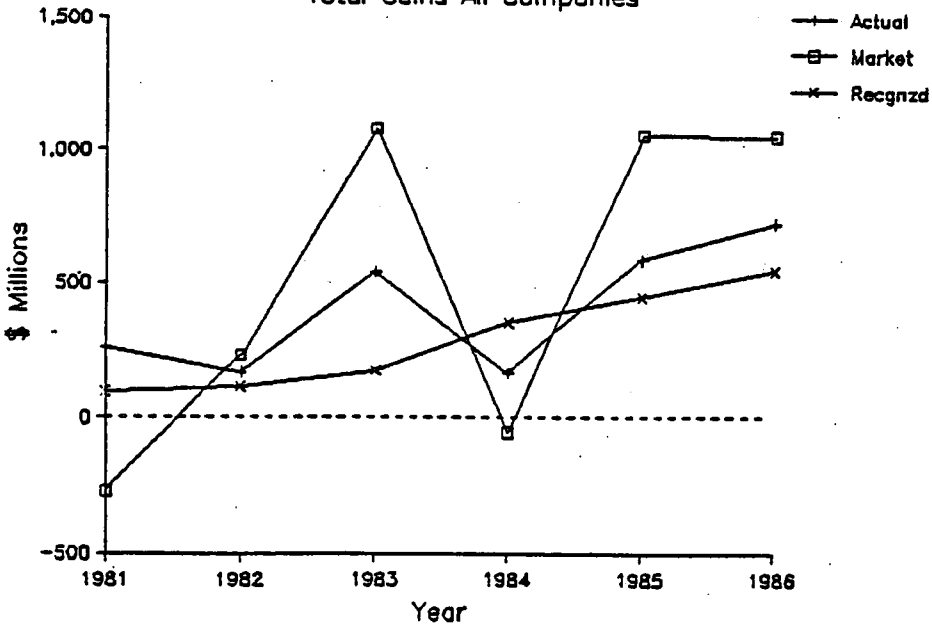
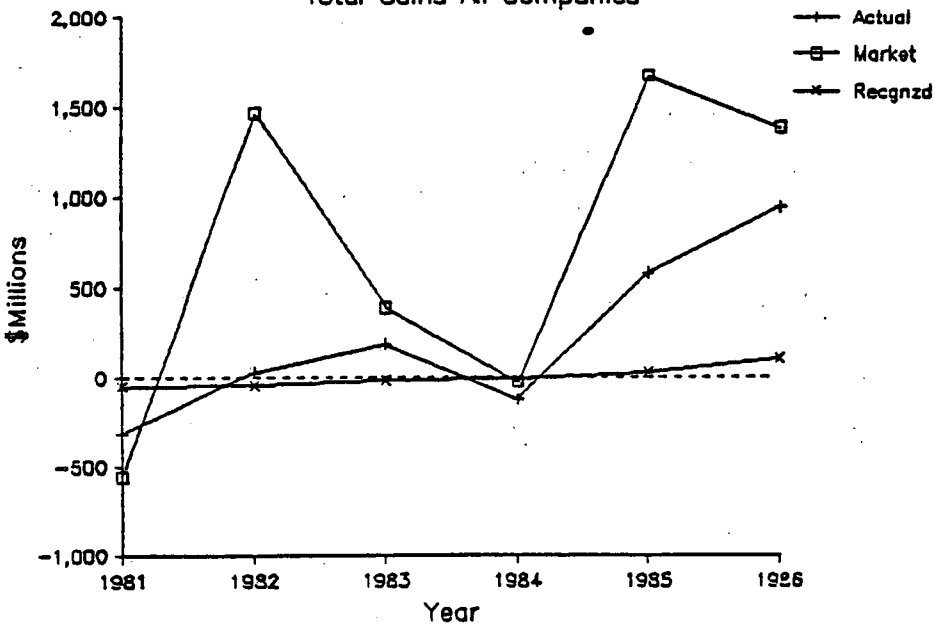


Illustration 2: BONDS

Total Gains All Companies



Invited Education Committee Session
CAAA Annual Conference, June 1988

INFORMATION SYSTEMS AND THE ACCOUNTING CURRICULUM

Chairperson: A. Rebecca Reuber, University of Toronto

Panelists: Len Fertuck, University of Toronto

Daniel B. Rubenstein, Office of the Auditor General of Canada

William E. McCarthy, Michigan State University

INTRODUCTION

The session addressed some issues surrounding the incorporation of Information Systems (IS) material into the accounting curriculum. The Spring 1987 Journal of Information Systems contains the Report of the AAA Committee on Contemporary Approaches to Teaching Accounting Information Systems (AIS) [Mock, 1987], and this report was used as a broad basis for the discussion.

In brief, the report asserts that accounting education must prepare students for four roles during their professional careers: users of information systems, auditors of information systems, designers of information systems, and evaluators of the effectiveness and efficiency of information systems. This emphasis on information systems stems from three major technological trends which the report identifies and which are elaborated upon below.

First, the proliferation of inexpensive and powerful hardware and software is changing practice in all organizations and in all areas of accounting. While this is indubitably true, what are the educational implications? Should we be concentrating on developing computer literacy, with hands-on exposure to micro-based software such as spreadsheets? Is it sufficient to expose students to today's software tools? Or should we emphasize more fundamental concepts so that students are able to deal with the inevitable technological changes in their future? Indeed, Professor Ijiri [1983] argues that increased computerization both allows and requires new forms of pedagogy.

The second trend noted by the report relates to the changes in services offered by public accounting firms, particularly in the area of management advisory services. IS is viewed as an opportunity that accountants can seize for competitive advantage. How should we address such an opportunity? Should we view IS as

an infrastructure encompassing the different areas of accounting? Or, should we develop IS as a specialty area offered within existing accounting programs?

Finally, the third trend is probably the most profound: the fact that the rapidly changing technological environment makes it both feasible and cost-effective to provide new types of financial, managerial and audit information. The AAA Committee on the Future Structure, Content and Scope of Accounting Education [Bedford, 1986] has taken a strong IS orientation to accounting education. What does this orientation mean for curriculum development? What are the major concepts we should stress so that future accountants can both recognize and operationalize opportunities within their evolving professions?

These issues were addressed by the three panelists. A summary of each presentation follows. A list of sample references in the area is provided at the end of the paper.

LEN FERTUCK

Fertuck set the stage for the subsequent discussion by comparing and contrasting accounting and IS. He argued that the two fields overlap in the areas of system design, data records, data processing, reporting, validation and users. However, within these areas the orientations taken differ between the two fields, as shown below.

Characteristic	Accounting	IS
Systems Design	Single Purpose	Multiple Purpose
Data Records	Paper	Electronic
Data Processing	Manual	Automated
Data Type	Monetary	Any
Reports	Summary	Varied
Validation	Ex Poste	Ex Ante
Users	Accountants	End User
History	500 Years	30 Years
Change	Slow	Fast

He then posited that there will be five major IS impacts on accounting practice.

1. The use of semantic data models (for example, McCarthy's REA accounting model[1]) will permit the representation of data in multi-dimensional and disaggregate form, and hence lead to single-entry bookkeeping.

---

[1]McCarthy, W.E., "The REA Accounting Model: A Generalized Framework for Accounting Systems in a Shared Data Environment," The Accounting Review, July 1982, 554-578.

2. All data (not just monetary data) will be recorded correctly once. Users can then generate reports using fourth generation languages on an "as needed" basis. There will be less periodic reporting, more exception reporting, and a use of expert systems to analyze the data collected.

3. Electronic transactions eliminate receivables (through debit cards) and paper trails, and reduce inventories (through Just-In-Time techniques).

4. Packaged software provides many of the necessary pre-defined reports and controls.

5. Automatic data recording leads to automatic validity checks. There will be continuous, rather than year-end, monitoring and a greater emphasis on control evaluation, rather than on substantive tests.

In order for future accountants to deal with these impacts, three major changes to the accounting curriculum are necessary. First, there should be a focus on database design, emphasizing a flexible database structure, and including non-financial information. Second, there should be less of a focus on providing a single financial statement, and more emphasis on ways to satisfy multiple user groups and to develop new information products. Third, auditing in this context requires involvement in IS design (particularly with respect to the design and evaluation of controls), continuous monitoring, and the auditing of package controls.

DANIEL RUBENSTEIN

Rubenstein argued that the impact of technological change on the accounting curriculum cannot be examined in isolation from concurrent social changes. New hardware, software and data communications tools are being provided at a time when there is an increasingly diverse population of stakeholders with rising expectations with respect to accountability. Thus, capabilities and requirements are changing simultaneously.

Rubenstein then identified three major impacts of these changes on the accounting curriculum. First, at a basic level, students need some hands-on experience with computer technology. Given that "constant technological change is a fact of our professional lives", graduates need to feel comfortable about working with technological tools. In addition, constant change means that accountants will need continuing education throughout their professional careers.

Second, students need to be prepared to manage technology. IS management topics Rubenstein identified as important to professional accountants include systems management, system development (project) management, and strategic decision making

with respect to IS investment and selection.

Finally, Rubenstein emphasized that a success critical factor for IS in the accounting context is the satisfaction of the needs of diverse stakeholders. Graduates need to be aware of issues such as how to identify major reporting constituencies and their primary economic interests, how to measure changes in economic relationships, how to set standards for the reporting of new kinds of financial and non-financial economic data, how to help users define ill-defined needs, and how to determine who should have access to what information. Along these lines he cautioned against training technicians who lack the judgmental skills of the previous generation of accountants.

WILLIAM MCCARTHY

McCarthy described the information systems track of the Program in Professional Accounting (PPA) at Michigan State University. It is an MBA program, allowing undergraduate students to enter in their junior year and finish after five years, or graduate students to finish in two years. Students who graduate from the program typically become information systems auditors, consultants with public accounting firms or closely-related organizations, or systems analysts in a corporate environment.

The program provides a basis of accounting knowledge through courses in financial and managerial accounting, auditing, and taxation. In addition, students are encouraged to take MBA electives in areas that provide strong functional skills such as financial modeling, manufacturing planning and requirements systems, and transportation and distribution modeling. Specialized course work in the information systems track has been designed within the guidelines of the Association for Computing Machinery (ACM) and the Data Processing Management Association (DPMA), and there is a prerequisite programming course.

Four specialized course offerings of the information systems track are the following:

1. Computerized Information Systems, which covers IS technology as well as topics such as systems documentation, internal control assessment and accounting cycle requirements. Students are required to use a micro-computer database system and encouraged to undertake a review of a local area business.

2. Design and Use of Small Accounting Systems, which emphasizes the theory of data modeling, introduces structured systems analysis, and familiarizes students with application software for micro-computers in areas such as payroll, order entry and general-ledger.

3. Advanced Accounting Information Systems, which focuses on mainframe computing, database management and structured systems analysis.

4. Concepts and Policies in Accounting Information Systems, which requires students to complete a computerized project in the area of decision support systems and expert systems, and makes heavy use of presentations by practitioners on various aspects of IS consulting and practice.

Several characteristics of the IS track are as follows. First, students are required to proceed through the track in a lock-step fashion and cannot pick and choose courses. Second, there is an emphasis on hands-on computing in realistic settings. Third, there is an emphasis on the development of specific software skills, and the use of data modeling as a conceptual foundation. There has been a conscious decision to deviate from the educational objectives proposed by Mock [1987], in several areas:

- more emphasis is placed on database concepts
- less emphasis is placed on internal control
- less emphasis is placed on the technology of information systems; technological topics are not covered in class, and students are required to cover this area on their own
- more emphasis is placed on AIS applications
- less emphasis is placed on management use of information
- the management of information systems is not covered
- more emphasis is placed on systems analysis and design
- less emphasis is placed on the auditing of AIS.

SUMMARY

The three panelists addressed the issues raised in very different ways, and several themes emerged from the discussion. There was a consensus that some computer literacy and hands-on exposure to computing tools is a necessary, but not sufficient, basis for an understanding of IS in the accounting context, and that this material should be augmented with more time-invariant concepts. They all agreed that an accounting curriculum should reflect changing trends in accounting practice. Fertuck focused mainly on the trends driven by technological change, and Rubenstein on the trends driven by social change. In both cases the impact was seen as occurring throughout the accounting curriculum. McCarthy's approach, one that also encompasses opportunities in the area of management advisory services, was to describe the issues involved in offering a specialized AIS program. Finally, the three panelists agreed that a central issue in accounting education is creating an awareness of the potential for providing new types of information. Rubenstein argued that graduates should be prepared for managing the process of providing such information, and that they should be

prepared to take an active role in defining and satisfying user needs. Fertuck and McCarthy, on the other hand, took an approach that emphasizes representation rather than use. The differences between the two approaches reflect the differences between "value theory" and "events theory" as discussed by Sorter[2] in a paper which has led to a stream of AIS research that is described by McCarthy[3]. Fertuck and McCarthy identified data modeling as a relatively time-invariant conceptual basis for the field, and one that supports the satisfaction of diverse and changing information requirements in a flexible manner.

---

[2]G.H. Sorter, "An 'Events' Approach to Basic Accounting Theory," The Accounting Review, January 1969, 12-19.

[3]McCarthy, W.E., "Multidimensional and Disaggregate Accounting Systems: A Review of the 'Events' Accounting Literature," MAS Communication, July 1981, 7-13.

A SAMPLE OF REFERENCES ON IS AND THE ACCOUNTING CURRICULUM

Adler, P.S., "Skill Formation in U.S. Accounting Firms: Pressures, Trends and Options," Office: Technology and People, May 1987, 3-16.

Armitage, H.M., Linking Management Accounting Systems with Computer Technology, The Society of Management Accountants of Canada, Hamilton, Ontario, 1985.

- described and reviewed by M.C. Munro in Contemporary Accounting Research, Fall 1987, 275-278.

Armitage, H.M. and Boritz, J.E., "Integrating Computers Into the Accounting Curriculum," Issues in Accounting Education, Spring 1986, 86-101.

Bedford, N. (Chairman), "Report of the AAA Committee on the Future Structure, Content, and Scope of Accounting Education," Issues in Accounting Education, Spring 1986, 168-195.

Burch, J.G., "Information Systems: Is It Too Late to Join the Revolution?" Journal of Information Systems, Spring 1987, 114-123.

Elliott, R.K., "Auditing in the 1990s: Implications for Education and Research," California Management Review, Summer 1986, 89-97.

Ijiri, Y., "New Directions in Accounting Education: Computers and Algorithms," Issues in Accounting Education, 1983, 168-173.

Jensen, D.L., Information Systems in Accounting Education, Ohio State University Press, Columbus, Ohio, 1985.

- described and reviewed by D.H. Drury in Contemporary Accounting Research, Fall 1987, 269-273.

Mock, T.J. (Chairman), "Report of the AAA Committee on Contemporary Approaches to Teaching Accounting Information Systems," Journal of Information Systems, Spring 1987, 127-156.

COUNTING, ACCOUNTING, AND THE INPUT-OUTPUT PRINCIPLE: RECENT ARCHEOLOGICAL EVIDENCE REVISING OUR VIEW ON THE EVOLUTION OF EARLY RECORD KEEPING*

Richard Mattessich
Arthur Andersen & Co. Professor Emeritus
University of British Columbia, Vancouver, B.C.

Abstract:

The first part of the paper deals with some conclusions of new archeological research of the Middle East, due to Professor Schmandt-Besserat: Not only was counting developed in three stages of different degrees of abstraction, but there also existed two different but related record keeping systems for giving account of commodity transactions and their results. The older and simple system (ca.8000 to 3100 B.C. and later) consisted of a variety of differently shaped plain tokens, placed into a sealed clay receptacle, while the later complex system (after 3200 B.C.) consisted of a greater variety of shapes and complex tokens which were variously incised; they were also perforated to be filed on a string which, similarly to the clay receptacle or envelope, was ultimately sealed.

The second part of this paper offers an interpretation of this archeological research from an accountant's point of view. Its major conclusion is that those ancient people were the first to apply the input-output principle (inherent in every actual commodity transfer) to a representational, quasi-numerical (and later numerical) system of record keeping. Above all, it demonstrates that this representational manifestation of the input-output principle reflects the same logical structure as double entry bookkeeping (i.e. the transfer of tokens from one "place" to another, within the same precinct, corresponds to a modern debit and credit entry). But it also shows that the placing of a token into a clay envelope after having impressed it on the softer surface of the clay envelope, constitutes a kind of double entry. Not merely because an actual entry and its negative imprint occurred, but because the functions, which this "entry" and its "negative imprint" fulfil, are basically the same as those accomplished by the debit and credit entries of a modern bookkeeping system.

* Financial support for this project by the Social Science and Humanities Research Council of Canada, and the valuable correspondence with and many suggestions from, Professor Denise Schmandt-Besserat are gratefully acknowledged. This article is an accounting interpretation of Schmandt-Besserat's (1977, 1978, 1980, 1981, 1981a, 1982, 1984, 1986, 1986a) archeological research and is partly based on Mattessich (1987 and 1988). In spite of some recapitulation, this article contains new insights and conjectures relevant to the history and foundations of accounting; it has been chosen as "Best 1988 Paper" at the Annual Convention of the Canadian Academic Accounting Association in Windsor, Ontario.

Introduction

The chief purpose of this paper is to offer some accounting interpretations of relatively recent archeological evidence on prehistoric (i.e. pre-writing) record keeping.[1] All historic disciplines, whether archeology, conventional history, or cosmic evolution, rely on interpretations often imbued with speculations. Here the interpretations are, as much as possible, supported by hard evidence and speculations are kept within reasonable bounds. The paper pivots on the early history of record keeping rather than bookkeeping and discusses the first manifestation of the input-output principle (i.e. the conceptual representation of economic transactions). It also distinguishes two different kinds of dualities: a fundamental duality pertaining to physical reality, (e.g. the transfer of commodities) and a derived duality restricted to social reality (e.g. ownership and debt-relations).

1. Did Accounting Precede Abstract Counting?

Historians of mathematics accept the hypothesis that the evolution of "counting" (in the broadest sense) proceeded in several distinct stages.[2] Recent archeological research in Middle Eastern writing and counting by Schmandt-Besserat (1980, 1983, 1984) yields evidence to support this and other hypotheses related to accounting. Following Schmandt-Besserat (1984) one

---

[1] For a survey of this evidence see also Schmandt-Besserat (1980, pp. 358-361) as well as Jasim and Oats (1986, p. 348); for a somewhat different archeological interpretation see Vallat (1986, pp. 334-337).

[2] Cf. Danzig (1959), E.E. Kramer (1970), and Flegg (1983).

characterizes three evolutionary stages -- which may be called counting by one-to-one matching, concrete counting, and abstract counting.

1.1 Counting by One-To-One Matching.

This involves the creation of a one-to-one correspondence between a sign (e.g. a pebble, a small stick or a curb on a bone,) and a commodity, like a goat, a measure of grain, or a coconut, repeating the sign for every additional unit of this commodity. Animal bones and antlers marked with notches excavated at Paleolithic and Mesolithic sites fall into this category. One of the earliest evidence, the famous "wolf bone," ca. 18 cm long, containing 55 notches, and found in Moravia in 1937 by Karl Absalom is "clear evidence that the tallying principle for [concrete] numbers goes back at least thirty thousand years."[3] The Vedda tribe of Ceylon (Sri Lanka) seemed to have used a similar method until relatively recently. Its members, in using a series of small sticks, did not abstract those signs but merely pointed to the lot of them, saying :"that many." This means, for example, as many sticks you see here, as many coconuts should be on the pile yonder. One hardly dares to call such a primitive procedure "counting," but as a method of accounting (in the sense of accountability and record keeping) it is quite effective. Although unaggregated (or aggregated in a very primitive sense)[4], the series of signs enabled those tribesmen to account for the quantity of the pertinent goods by providing a fairly permanent record and check. Such sticks or

---

[3] Flegg (1983), p. 42.

[4] I regard aggregation as a matter of degree. A collection of physical objects in a specific location (e.g. a pot or box) is probably the most primitive way of aggregation, while adding some numerals or monetary values is an abstract and more sophisticated way of aggregating.

pebbles are likely to have been used for many kinds of commodities and it is tempting to conjecture that this first stage of counting was the birth of abstract numbering. But the experts seem to deny this (cf. Schmandt-Besserat 1984, p. 52); although they admit that here some kind of abstraction manifests itself already, they point out that there is neither any indication of a set or quantified collection, nor is the object of this proto-abstraction a numeral.[5] They argue that those unaggregated or primitively aggregated signs were case specific, since only the persons performing or attending such a particular record keeping event were aware which commodity was actually matched. Even the next evolutionary step did not involve abstract numbers, but created a device capable of permanently identifying the commodity recorded by this one-to-one correspondence.

1.2 Concrete Counting by Tokens and Specific Number Words

1.21 Simple Tokens (see Exhibit 1): We are here dealing with special enumeration through concrete tokens and specific number words. The most frequently cited example of this second stage stems from the eminent anthropologist Franz Boas (1889) who studied, among many other American Indian tribes, the Tsimshians of British Columbia. This tribe uses different, highly specific numberwords for different objects even when the same numeral is

---

[5] "Numerals are symbols to represent abstract numbers. Abstract means removed from concrete reality. Abstract counting refers to using number concepts abstracted from any particular collection. As a result 1,2,3,... are universally acceptable. Concrete counting, on the other hand, does not abstract numbers from the things counted. As a result, in concrete counting the number words that express the concepts "one", "two", "three", etc. differ according to whether, for instance, men, canoes, or trees are being counted. These different sets of number words, which change according to the category of item counted, are called concrete numbers." Schmandt-Besserat (1984), p. 48.

involved -- more precisely, this language possesses a set of seven words for each of the first ten numbers (see Table I). Yet this example reveals only a

---

Table I

---

vestige of the second stage of numbering, as the Tsimshians also seem to have been in possession of abstract numbers and the corresponding general numberwords (see last column of Table I). But as "it must have taken ages to discover that a brace of pheasants and a couple of days were both instances of the number two" (Russell 1919/60, p.3), the following example offers recent evidence of times when this crucial step of abstraction was not yet made.

Exhibit 1

Collections of plain, concrete clay tokens of various shapes (approx. 1 to 4 cm across) over 10,000 years old have been discovered among village finds (and later temple finds) unearthed in great numbers in the Fertile Crescent of the Middle East. Starting about 3250 B.C. these tokens were sometimes enclosed in hollow clay balls (some 10 cm in diameter -- see Exhibit 2), which Legrain (1921) originally called "bulles spheriques" and which Schmandt-Besserat (1980, p. 359) prefers to address as clay envelopes.[6] On occasion the surface of these receptacles or "envelopes" bore markings -- which in turn are among the first evidence of writing -- indicating the content at a glance (Exhibit 3). These seem to be the earliest systematic accounting systems. Particularly striking is Schmandt-Besserat's presentation of such tokens from

---

[6] It is suspected that before 3250 B.C. token receptacles of more perishable material were used.

Uruk. She was able to match those tokens to the commodities to be represented in the following way (adapted from Schmandt-Besserat 1983, p. 120):

Tokens (Accounts):	Commodities:
3 incised ovoids	= 3 jars of oil
1 cylinder	= 1 animal (sheep or goat)
9 tetrahedrons	= 9 units of services
3 shapes of trussed ducks	= 3 trussed ducks
5 ovoids	= 5 (still unidentified)
4 parabolas	= 4 (still unidentified)
1 triangle	= 1 small measure of grain?
26 spheres	= 26 bariga (larger measures) of grain

Thus every type of token is basically a specific type of account -- what we discriminate by words or names, the ancient Sumerians discriminated by token shapes. Thus the main feature of "token accounting" is to be found in the diversity of shapes made possible by moldable clay that could be hardened by kiln fire thereby imparting greater permanence to the tokens.

Exhibit 2
and
Exhibit 3

A sphere with tokens was equivalent to a personal account representing that portion of the total assets (or equity) invested in a particular debtor but at the same time it constituted an inventory revealing further details. As each token stood for a single piece of a commodity, quantities of various kinds of goods could easily be tracked. But this primitive form of aggregation was limited by the lack of abstract numbers.

1.22 Complex Tokens (see Exhibit 4) offer a greater diversity of shapes, various markings, and perforations for stringing them together. This proliferation of shapes and markings of tokens indicates an increase in the number of goods accounted for. These changes, which occurred during the formation of the Sumerian city states show the correlation between the

development of accounting and bureaucratic growth. It may be that the multiplication of tokens coincided with the imposition of mandatory dues to the state and the control it entails. The complex tokens enabled the keeping track of a larger number of different commodities in a more specific way; but like the plain ones, each complex token still represented one unit of a particular good or service. The clay receptacles, as well as the sealed string of tokens, are both corresponding to accounts about stewards or debtors, with accompanying lists of inventories. It is crucial to note, therefore, that before 3,200 B.C. there is no evidence that either plain or complex tokens represent numerals. Counting in the abstract sense, as we know it today, had not yet emerged at this stage. And in this particular sense one may assert that accounting preceded abstract counting.

Exhibit 4
and
Exhibit 5

1.3 Abstract Counting

Abstract numbers (numerals) seem to have emerged, simultaneous with writing, after 3200 B.C.in the Sumerian city states, soon after complex tokens came in use. The first evidence of the use of abstract numbers occurs on Sumerian clay tablets showing lists of goods. The signs indicating the items counted derived their shapes from tokens. However, instead of repeating the token two, three or four times to indicate two, three or four units of a product, the written sign was preceded by a numeral - a sign that expressed a number. These numerals denoting the concept of oneness, twoness, threeness, could be applied to the counting of jars of oil, as well as measures of grain or any other kind of goods. At this stage the concept of a number is no

longer identified with a specific item counted, but assumes an abstract or Platonic existence of its own. This enabled the universal application of such natural numbers as 1, 2, 3, etc. to all kinds of countable objects. Abstract counting depends on several factors, not only on designating individual items, but also on identifying them with an ordered series of numbers, and being aware that the number assigned to the last item of the collection is identical to the total number counted -- cf. the interesting article by Bower (1987) on "Calculating Apes."[7] The transition from the more concrete to the more abstract is illustrated by Smith (1951, p. 8) who lists examples in which primitive societies derived their number words from concrete enumerations frequently in use. He points out that the Nunes of the Southern Pacific counted with numbers that literally meant "one fruit, two fruits, three fruits," while in other situations the numbers meant "one grain, two grains, three grains," or "one stone, two stones, three stones."

After these preliminary considerations, we turn to the implications of this development. The logical structure of transactions and the various possibilities of their conceptual representation receives particular attention.

2. The Input-Output Principle: from Ancient Mesopotamia to the 20th Century

There exists evidence that the simple tokens represented grain, sheep and goats whereas the complex tokens represented labour and manufactured

---

[7] See also Piaget's (1977, pp. 37-44) exposition on the "Logical nature of the whole number" and children's stages in attaining "general" or abstract categories (p. 41).

commodities.[8] This suggests a similarity with the distinction between cash items and non-cash items in early Renaissance bookkeeping;[9] it is all the more striking as grain, sheep and goats were, indeed, the "cash" and payment units of the ancient Middle-East.

2.1 Entities, Stewardship and Debtor Relations

I have interpreted each type of token shape as a type of account, and the number of tokens (of a particular shape) contained in a clay envelope or on a string indicates the quantity of specific items. Consequently the sum-total of the various tokens in a particular envelope or on a string stood for that part of his equity which a creditor lent to a debtor. Such a primitive system is closer to physical reality than our modern monetary approach, and has the advantage of avoiding the "valuation problem". For this reason it is more appropriate to regard such a token aggregate as a "superaccount", not unlike a balance sheet -- it may be no coincidence that we still speak of the "content"

---

[8] "Despite the relative lateness in date of such envelopes, they predominantly held plain tokens and rarely complex ones, a fact which would argue for the distinctly different uses to which plain and complex tokens were normally put.

Whereas simple tokens were found in and refer to the commodities of agricultural communities, complex tokens not only arise in urban centers, but also quite clearly pertain to products of urban workshops. Moreover, as we shall see, complex tokens constitute a much more complicated accounting system by virtue of their varying shapes and the extraordinarily wide range of markings which they bear". Schmandt-Besserat (1986), p. 34.

[9] Etsuzo Kishi, in discussing the Renaissance "prototype of the double-entry method" -- mainly by V. Mennher (1550) -- emphasizes that under this method

> "Cash, credit and debit are to be managed separately from goods. This is derived from the tradition of the ancient Roman empire". Kishi (1984), p. 353

of an account as well as the "content" of a balance sheet.[10] Of special importance is the fact that those "aggregates" had a dual meaning -- something that may not have escaped the Sumerians: in its details, it revealed individual assets, in its totality it revealed an equity or part of it.

The entity behind such an equity was either a city or temple government or a personal or family unit.[11] The levying and paying of taxes was possibly based on the farming out of temple assets to individuals (the punishment by beating in the case of refusal or inability to fulfil ones repayment or tax obligation is documented in ancient pictures). But since these "superaccounts" would not have reflected the total equity of a temple, further aggregation of all those envelopes and string systems within a single precinct would have been necessary. The IOU-nature of such token aggregates and of the subsequent clay tablets is also documented -- cf. Schmandt-Besserat (1986) p. 34. From younger archeological records, one may infer the possibility that the tokens or token aggregates were handed over as receipts to the debtor and voided once the debt was fully "paid" (just as it was the case with the later clay tablets -- see footnote 17).

---

[10] A reviewer of this paper referred in this connection to Roger North's Gentleman Accomptant (London 1714) which states that:

> "Cash is from the Italian Cassa or Chest, in which they keep their Specie of Money; and it is a pleasant Metonomy, when Chest is full of Money."

Here too the linguistic root of an accounting term lies in a physical object with a potential "content".

[11] "The evidence also indicates that plain and complex tokens were managed by different sets of hands within the Sumerian temple administration, the plain tokens belonging to the pens and granaries whereas the complex sort pertained to the workshops. Indeed complex tokens clearly seem to be associated with the world's first system of coercive taxation and redistribution of goods". Schmandt-Besserat (1986), p. 34.

2.2 The Logical Structure of a Transaction

These recent archeological discoveries certainly have put accounting into the focus of the earliest history of counting, writing and civilization. But, beyond this, they have major significance for understanding the origin and the very foundation of the input-output structure of modern accounting.

Since the late fifties I have endeavored to demonstrate that the foundation of accounting is not to be found in the techniques of double entry but in the logical form of a transaction (cf. Mattessich 1957/82, 1964/77, 1984, 1987, 1988 etc.).[12] This structure manifests itself empirically in such economic events as sales and purchases, investment and debt transactions, production and other transfer processes, etc. But at the same time this same structure can conceptually be represented not only in form of journal and double entries but also in form of matrices, algebraic equations, flow diagrams or net-works, and vectors.[13]

The preceding recapitulation has shown that this logical form has already manifested itself in prehistoric data processing systems. Since the ancient

---

[12] Recent reference to this "more abstract outlook" for the present and future computerization of accounting, can be found by Leech (1986) and Mepham (1987).

[13] A set-theoretical analysis of this "flow" or "input-output" structure in terms of ownership and debt relations, etc. is found in Appendix A of Mattessich (1964/77), pp. 448-465. To this Willett (1987, pp. 159 and 162) offers the following remarks: "Mattessich's formal theory of accounting ... predates Ijiri's and was probably the first serious attempt to axiomatize the discipline [p. 159] ... The two most famous and ambitious attempts to axiomatize conventional practice (Ijiri, 1965 and Mattessich, 1964) have both been transactions based. They provide certain insights into the principal elements ... The most important contribution of Mattessich's theory was his attempt to define, albeit indirectly, the basic elements of the accounting structure in qualitative terms. In particular a debt claim is defined (1964, p. 449) as the value of some function $-$ such that $-(e_i, e_j, T) = v_{ij}$, where e_i, e_j are accounting entities and T is a time interval, and v_{ij} is a value [p. 162]" (our italics).

people of the Middle East exploited the transfer of clay tokens from one location to another to represent various economic transactions, there can be little doubt that an input-output structure dominated those early accounting systems. Of course, one might argue that this is trivial since the transfer of services or commodities, from one person or place to another, is already endowed with such a duality. But this objection fails to grasp the essential point: the objection refers only to empirical structures and events and misses the crucial idea of duplicating the input-output of actual commodities through the input-output of tokens by means of which conceptual representation of this duality becomes possible. Once this decisive fact of the input-output principle is recognized, it is a secondary problem, whether the ancient people of the Middle-East possessed a double-entry system or not.[14] Nonetheless this point shall be examined in Subsection 2.5. But before, some hidden connections between two apparently different duality aspects must be explored.

2.3 Two Kinds of Accounting Duality

2.31 Physical Reality and the First Type of Duality: The first kind of accounting duality arises out of the physical aspects of the output of a commodity from one place, and its input to another. In general, it expresses the one-to-one correspondence between an empirical event (such as a sale and purchase, or the transfer of goods and services from one department or process to another), on one side, and some representational scheme -- be it a token

---

[14] The significance of the input-output principle for double-entry accounting is well recognized in the literature, e.g.:

> "The writer wishes to emphasize the merit that comes from understanding a double-entry bookkeeping as an input-output system of data calculating the amount of capital charged". Kishi (1984), p. 359.

accounting system of Mesopotamia or a computerized matrix accounting system in 20th century America -- on the other side.

2.32 Social Reality and the Second Type of Duality: The second kind of duality seems not so much to arise out of a physical transfer, but of the fact that every asset belongs to somebody, and therefore is by its very nature simultaneously an equity or part of it. While the first type (involving the mere transfer of goods) possesses undoubtedly a manifestation in physical reality in the broadest sense, this is not so obvious with regard to the second type which involves more complex relations such as those of ownership and investing as well as lending and borrowing -- all belonging to the reality of social relations. Today, accountants regard those events also as transactions, but if we probe their roots we notice that the nature of those transactions is more abstract; yet the justification for calling them transactions may be found in their having a link to the more physical or concrete transactions. Yet what is this link?

Investing and lending activities usually result in the transfer of some commodity or a purchasing power through which a commodity can be acquired; and for the following two reasons the duality is no less present in those more abstract transactions: first, any borrowing is ultimately matched by some lending, and any investing by some ownership; and second, more importantly, debt and owner's equities are internalizing what otherwise would be an external physical duality (i.e. a transaction from one entity to another). This peculiar relationship can be illustrated by Exhibit 6 -- adapted from Mattessich (1964/77, p. 455) -- which reveals both the internal (or intra-entity) as well as the external (or inter-entity) flows or transactions.

Explanation to Exhibit 6: This combined matrix represents the following inter- and intra-entity transactions of two entities E_1 and E_2 doing business with each other. The matrix shows the credits in the rows and the debits in the columns[15]:

Exhibit 6

(1) Investment of owner's equity by entity E_2 in entity E_1 by handing over some machinery.

(2) Entity E_1 receives raw material from E_2 on a credit basis.

(3) Entity E_1 supplies some finished goods to E_2 in cancellation of some of its debts against E_2.

The intra-entity transactions are recorded for each of those two entities and bear the pertinent sequence numbers in a circle. Since the entities are considered to be independent of each other, each event must be recorded twice -- even in a two-dimensional matrix (once for E_1, the second time for E_2). But the matrix also reveals in the empty circles the, yet unrecorded, physical flows (of machinery, raw materials, and finished goods from one entity to another -- i.e. the inter-entity transactions).

However, if the two entities were to merge and become merely two departments of the same firm, only those transactions (with empty circles), instead of the corresponding ones with numerals, would be recorded (this proves that there are physical flows behind the inter-entity transactions

[15] This accounting convention (in contrast to the later "Gomberg convention" which uses the rows as debits and the columns as credits) was first adopted by De Morgan (1846) and in our century by Leontief (1951) as well as Mattessich (1957/82 and 1964/77).

which themselves reveal only abstract flows (e.g. between such different "things" as Machinery and Owner's Equity). Another consequence of the assumed "merger" is that the transactions marked by a ‖ (a second kind of what were originally inter-entity transactions), would be required to cancel out the claims or obligations between the two departments (formerly two separate entities).[16] To show how inter- and intra-entity transactions are linked with each other, we connect them (in Exhibit 6) with horizontal and vertical dashed lines. Hopefully this analysis has clarified those connections and shed some light on our previous assertion that the two dualities, although by no means identical, are closely tied to each other, and may be considered as two aspects of a basically physical duality. Above all, it should now be obvious that the transactions involving debt or investment relations, though not themselves concrete, can be reduced (e.g. in the case of a merger) and traced to physical inputs and outputs.

Whether the representation of the more concrete commodity transactions preceded historically the more abstract investing and lending transactions is not known. But there is evidence that by 3250 B.C. -- the time when the sealed clay envelopes and string systems emerged -- accounting had already incorporated ownership claims as well as stewardship or debt relations -- the latter two may not have been clearly discerned at this early stage as two different legal relations. The importance and function of the clay seals on the envelopes as well as on the string aggregates, can be inferred from later times when a refined cuneiform writing offers detailed evidence and

---

[16] In contrast to having separate raw material inventory and machinery accounts for each department, no separate receivables and payables accounts are assumed to be kept for each department.

explanation about the legalistic or semi-legalistic function of those seals.[17] It is from those later records that the more abstract and legal relations can be inferred.

But the fact that both the clay envelope as well as the string aggregate were usually firmly sealed -- so that the transfer from one personal account to another was impeded -- is evidence that our hypothesized transfer of tokens was allowed only to authorized persons. The seal will have been kept on as long as the personal account was "inactive", but could be broken as soon as one or more transactions were recorded through the exchange of tokens. Afterwards a new seal, possibly incised with different appropriate data, was made.[18] To every piece of commercial reality (a measure of grain, a ewe or ram, a jar of oil or a piece of silver) of those ancient people, there corresponded a specific token in their representational accounting system. It does not matter that this system itself consisted of concrete objects (like cylinders, cones, etc.) instead of abstract, written symbols; on the contrary this intermediary step reveals to us the evolution of a conceptual system-- it not only demonstrates that abstraction is a matter of degree, but shows how more abstract representational systems evolved from less abstract ones. The crucial thing is that we are here not dealing with the actual transfer of commodities, but with their representation for accounting purposes.

---

[17] "Sumerian clay tablets by the tens of thousands (literally), inscribed with their business, legal, and administrative documents crowd the collections of these same museums, giving us much information about the social structure and administrative organization of the ancient Sumerians". S.N. Kramer (1963), p. 379.

[18] This representational method can even be associated with the correspondence theory of truth as promulgated by Bertrand Russell and developed in Wittgenstein's (1922) Tractatus -- for further details on this relation to the correspondence theory see Mattessich (1987 and 1988).

2.4 The Hierarchy of Archaic Accounts

We have previously established that every "asset account" seems to have been characterized by a specific token shape. But these accounts were not limited to purely tangible assets, occasionally they included a claim to services (the tetrahedron token seems to have represented a day of labour--see Schmandt-Besserat (1980), p. 375). Beyond this lower echelon of accounts, one or two higher echelons have to be distinguished.

The second level of accounts is represented by the receptacles, i.e. clay envelopes as well as string aggregates. Similar to the income statement, these would undoubtedly have been accounts of a higher echelon since they usually contained tokens of different shapes and thus summarized the content of several accounts (but unlike the income statement, they did not summarize "nominal" but "real" accounts).

The third level of accounts can be found in the accumulation of all clay envelopes and string aggregates within one temple precinct or other entity. If all those receptacles were kept in one room, then this room would, in a way, have been equivalent to our modern balance sheet (e.g. each receptacle representing an accounts receivable and the totality representing the "owner's equity").

But how about income measurement? Those archaic accounting systems do not offer any direct evidence, neither for the notion of income nor for any attempt of its measurement. However, it may well be possible that, whenever a debt relationship was entered and the pertinent token receptacle was created, a token was added by means of which the pertinent aggregate did not constitute the original debt but the final debt, i.e. augmented by an interest or income item represented by this added token -- similar to later accounting practices,

e.g. during the 16th and 17th century, when debts were invariably recorded at their discharge value. If interest was charged at all, this scenario is more likely than the alternative of establishing the interest at the time of repayment without having any agreement and record in advance.

2.5 The Origin of Double Entry Record Keeping

We have seen above that those ancient people of the Middle East had record keeping systems, the basic logical structure of which was virtually identical to that of modern double entry. But did they have some kind of double entry record keeping? As surprising as it may seem, a good case can be made that such a double entry system (which must not be confused with a double-entry bookkeeping system) did exist over five thousand years ago.

The original clay envelopes (ca. 3250 B.C.) had a great disadvantage: once sealed, one did not know their token content unless breaking the seal--something that was supposedly permitted only at the event of settlement -- cf. Schmandt-Besserat (1980), p. 366, 377, and Rosengarten (1960), p. 221. But relatively soon after the emergence of the original envelopes (ca. 3200 B.C.) it was already customary to impress the softer clay surface of those envelopes with the hardened clay tokens before putting them into the receptacle and sealing the latter (see Exhibit 3).[19] This enabled one to determine at a first glance the content of the envelope while the seal and other markings may have informed about the debtor and other details. There can be little doubt that inserting a token into a receptacle was equivalent to a "debit entry" in an asset account. Yet there were two other requirements: First, to indicate,

---

[19] This inconspicuous impressing of the clay tokens upon the surface of the receptacle may turn out to have been one of the greatest steps of mankind; not only was it the precursor of modern double-entry bookkeeping, more importantly, it was the major impetus to cuneiform writing as well as abstract counting.

on the outside of the clay envelope, the individual items contained in it, and second, to disclose instantaneously the total equity represented by the receptacle. By a lucky stroke these two requirements could be met in a single step: impressing the hardened tokens upon the softer, unburned surface of the clay container. The resulting indentations (see Exhibit 3) are mirror pictures and true counter-entries (credit entries) on the equity side of this prehistoric record keeping system.

2.6 Accounting and the Principle of Conservation or Symmetry

This paper is concerned with the early history as well as the foundation of accounting. But the latter aspect occasionally raises the question whether the input-output principle of accounting might fulfil a similar function as the principles of conservation of physics.[20] Since prehistoric accounting directly represented physical transfers, and did not deal with any monetary valuation, the first kind of duality (see Subsection 2.31) may be regarded as reflecting such conservation. Or in other words: the transfer of a token from one location to another, conveyed that in the act of physically transferring a commodity from one person (or institution) to another certain qualities of that commodity were preserved.

Yet accounting is not only concerned with momentary events but also with the changes of wealth over time. Just as the conservation laws of physics and

---

[20] Cf. Mattessich (1980, p. 233 and 1984, p. 408) as well as Thornton (1985, p. 137), and Swanson (1987, pp. 82, 90, 91) who even speaks of a "matter-energy flow" in accounting.

chemistry[21] are designed to give account of what happened to the input of energy and matter, momentum, spin, etc. in terms of the corresponding output, so accounting tries to give account in terms of commodity utilization.[22] Even if some commodities get consumed, lost, or dissipated during a certain transformation, it is that "giving accounting" of the total input in terms of the total output (or vice versa) which is crucial for every principle of conservation. To many accountants and economists it seems to be a flagrant contradiction to consider something "consumed" or even "lost" as something "conserved" (cf. for example Adam Smith's narrow income definition from which mere "services" were excluded because they are instantly consumed). But asserting such a contradiction would be like insisting that the second law of thermodynamics (entropy law: the increase of dissipated energy in the

---

[21] Apart from the law of conservation of matter and energy, quantum theory knows conservation principles with regard to electric charge, linear momentum, spin (angular momentum), iso-spin, barryon charge, muon charge, strangeness, combined parity (space reflection) plus charge reflection plus time reversal, etc. For further details see Parker (1982), pp. 38, 175-176, 891-892, 1135-1141, 1213-1215.

[22] Physicists freely admit that their conservation or symmetry laws imply accountability which for example, is greatly facilitated by such notions as "work" (force times distance):

> "Work is a mere bookkeeping device to keep track of transfer of energy from one thing to another." Olenick, Apostol, and Goodstein (1985), p. 249.

Even more startling is the following statement: of "physics-accounting" which leads to the postulation of a total zero-energy in the cosmos (see also Tryon (1973) pp. 396-397:

> "But there is also another form of energy important to cosmology, that acts in a sense, in opposition to this mass-energy. Namely gravitational potential energy ... One could think of this as the supply of energy needed to push the galaxies infinitely far apart; hence it is regarded as a negative energy on the ledger books of the universe". (our italics) Bartusian (1986), p. 256.

universe) contradicts the first law of thermodynamics (conservation of energy). Yet the fact that some energy is wasted (i.e. no longer available to do work because it is dissipated as "useless" heat) does not negate the constancy of energy in this universe. Even when the accounting process is extended to valuation (in spite of the latter's subjective nature), it is possible to cope with this problem. One might talk about value accountability of inputs in terms of outputs, provided "wasted (dissipated) value" is included under value conservation no less then "wasted (dissipated) energy" is included under energy conservation. Again, the criterion for "conservation" is not whether the pertinent item is useful or useless, but whether it has been accounted for or not. But accountants irritated by the expression "conservation", may substitute for it the term "symmetry" -- even physicists nowadays speak of principles of symmetry when referring to the laws of conservation.

Since the accountability of energy and physical reality can be cast in terms of universal principles of symmetry, the accountability of value and social reality by similar means, might deepen our understanding of accounting and simultaneously shed further light on one important aspect of physics: its function as a cosmic accounting system.

APPENDIX A

CHRONOLOGICAL TABLE: EVOLUTION OF ACCOUNTING AND SYMBOLIC REPRESENTATION IN THE MIDDLE EAST

I 8000 B.C.: Simple clay tokens of various shapes (spheres, disks, cylinders, triangles, rectangles, cones, ovoids, and tetrahedrons, each standing for a unit of a specific commodity), accounting for the stocks and flows of agricultural goods and services -- coinciding with agricultural revolution.

II 3300 B.C.: Complex tokens with incised lines or punctations (and occasionally perforated) appear in the old as well as some new shapes (parabolas, vessel forms, trussed duck forms, bent coils, etc.)-- coinciding with first monumental architecture and the rise of temple governments, indicating a need for greater accounting accuracy.

III 3250 B.C.: Emergence of sealed aggregation devices: Hollow clay envelopes (bullae) to safeguard accounting tokens (usually representing agricultural products that were common "currencies") and sealed string systems for safeguarding perforated accounting tokens (usually representing manufactured goods and labour units). Both devices were impressed with personal or institutional seals and often used simultaneously to give evidence for inventories and debt claims as well as the equities behind them -- indicating increasing legalism and bureaucratism.

IV 3200 B.C.: Surfaces of clay envelopes are also impressed with each token to be enclosed (or each token shape combined with a number symbol) to reveal from outside the assets and equity represented by the token content -- constituting a kind of double entry system (actual tokens inside represent assets, negative token impress outside represent counter-entry of pertinent equity), as well as the beginning of abstract counting and writing.

V 3100-3000 B.C.: First pictographs incised in soft stones (very rare in contrast to the abundance of clay tokens and early pictographs in clay). Emergence of archaic cuneiform writing, using many symbols identical or similar to negative token impressions. Continuing use of both token accounting systems.

REFERENCES

Bartusiak, Marcia, Thursday's Universe -- A Report from the Frontier on the Origin, Nature and Destiny of the Universe (New York: Time and Omni Books, 1986).

Boas, Franz, "Fifth report on the northwestern tribes of Canada." Proceedings of the British Association for the Advancement of Science, 1989.

Bower, Bruce, "Calculating Apes" Science News, vol. 13 (May 1987), pp. 334-335.

Danzig, Tobias. Number; The Language of Science, 4th ed. (New York: MacMillan Co., 1959).

DeMorgan, August, Elements of Arithmetic -- 5th ed. Appendix "On the Main Principle of Bookkeeping", London: 1846.

Flegg, Graham, Numbers -- Their History and Meaning, (New York: Schocken Books, 1983).

Ijiri, Yuji, "Axioms and Structures of Conventional Accounting Management." The Accounting Review (January 1965), pp. 36-53.

Jasim, S.A. and Oates, J. "Early Tokens and Tablets in Mesopotamia: New Information from Tell Abada and Tell Brak." World Archeology (February 1986), pp. 348-362.

Kishi, Etsuzo, "Prototype of Double Entry Method by V. Mennher." Proceedings of the Fourth International Congress of the History of Accountancy, ed. by Tito Antoni (Pisa: ETS Editrice, 1984), pp. 349-362.

Kramer, Edna E., The Nature and Growth of Modern Mathematics, (New York: Hawthorn Books, 1970).

Kramer, S.N. "The Early History of Cuneiform." The World of the Past ed. by Jacquetta Hawkes (New York: Alfred A. Knopf, 1963), pp. 379-380.

_____, The Main Stream of Mathematics, (New York: Oxford University Press, 1955).

Leech, S.A. "The Theory and Development of a Matrix-Based Accounting System" in Accounting and Business Research (Autumn 1986), pp. 327-341.

Legrain, Léon, "Empreintes de cachets élamites, "Mémoire de la mission archéologique de Perse, vol. 16 (1921), pp. 7-8.

Mattessich, Richard, "Prehistoric Accounting and the Problem of Representation: An Archeological Evidence of the Middle East from 8000 B.C. to 3000 B.C." The Accounting Historians Journal (Fall 1987), Vol. 14, No. 2, pp. 71-91.

Mattessich, Richard, "Wittgenstein and Archeological Evidence of Representation and Data Processing from 8000 B.C. to 3000 B.C." Presentation at the 12th International Wittgenstein Symposium, 1987 in Kirchberg/Wechsel, to be published in: Philosophy of Law, Politics and Society ed. by Ota Weinberger and Peter Koller (Vienna: Hölder-Pichler-Tempsky, 1988).

_____ "Management Accounting: Past, Present, and Future." Management Accounting 1980 ed. by Peter Holzer (Urbana-Champaign: Univ. of Illinois, 1980), pp. 209-240.

_____(ed.), Modern Accounting Research: History, Survey, and Guide. (Vancouver, B.C.: Canadian Certified General Accountants Research Foundation 1984).

_____ "Towards a General and Axiomatic Foundation of Accountancy -- With an Introduction to the Matrix Formulation of Accounting Systems." Accounting Research (today: Journal of Accounting and Business Research) Vol. 8, No. 4 (October 1957), pp. 328-55. Reprinted in The Accounting Postulate and Principles Controversy of the 1960's ed. by Steven A. Zeff (New York: Garland Publ., Inc., 1982).

_____. Accounting and Analytical Methods -- Measurement and Projection of Income and Wealth in the Micro- and Macro-Economy. Homewood, Ill.: Richard D. Irwin, 1964. Reprinted in "Accounting Classics Series" Houston, Tex.: Scholars Book Co., 1977).

Mennher (de Kempten), Valentin. Practique brifue pour eyfrer et tenir liures de compt touchant le principal train de marchandise. (Anvers: 1550).

Mepham, M.J. "A Conceptual Model for Database Accounting". Presented at the British Accounting Association Conference at the University of Glasgow (Edinburgh, U.K.: Heriot-Watt University, Working paper, 1987).

North, Roger. The Gentleman Accomptant. (London: 1714).

Olenick, R.O., Apostol, T.M., and Goodstein, D.L. The Mechanical Universe (New York: Cambridge University Press, 1985).

Parker, Sybil et al., McGraw-Hill Encyclopedia of Physics (New York: McGraw-Hill, Inc., 1982).

Parker, Sybil et al. (eds.), McGraw-Hill Encyclopedia of Physics (New York: McGraw-Hill, Inc., 1982).

Peterson, Ivars. "Picture This: The Sounds of Speech Lead to Novel Ways of Representing Complex Data." Science News, vol. 131 (June 20, 1987), pp. 392-395.

Piaget, Jean, Psychology and Epistemology -- Towards a Theory of Knowledge (transl. by A. Rosin) (Harmondsworth: Penguin Books Ltd., 1977).

Pickover, Clifford A., "Computers, Pattern, Chaos and Beauty." IBM Research Report. (Yorktown Heights, N.Y.: IBM Thomas J. Watson Research Center, 1987).

Rosengarten, Yvonne. Le Cocept sumérien de consommation dans la vie économique. Paris: 1960.

Russell, Bertrand. Introduction to Mathematical Philosophy. London: George Allen and Unwin 1919, 10th ed. 1960.

Schmandt-Besserat, Denise. "The Earliest Precursor of Writing." Scientific American, Vol. 238, No. 6 (1978), pp. 50-58.

_____. "The Envelopes that Bear the First Writing." Technology and Culture, Vol. 21, No. 3 (1980), pp. 357-385.

_____. "Tablets and Tokens: A Re-examination of the So-called 'Numerical Tablets." Visible Language, Vol. 15 (1981), pp. 321-344.

_____. "Decipherment of the Earliest Tablets." Science, Vol. 211 (1981a), pp. 283-285.

_____. "Tokens and Counting." Biblical Archeologist, (Spring 1983), pp. 117-120.

_____. "The Emergence of Recording." American Anthropologist, Vol. 84 (1984), pp. 871-878.

_____. "Before Numerals". Visible Language, Vol. 15, No. 1 (1984), pp. 48-59.

_____. "The Origins of Writing -- An Archeologist's Perspective." Written Communication, Vol. 3, No. 1 (January 1986), pp. 31-45.

_____. "The Precursor to Numerals and Writing." Archeology, (Nov./Dec. 1986a), pp. 32-38.

_____. "An Archaic Recording System and the Origin of Writing," Syro-Mesopotamian Studies, Vol. 1, No. 2 (1977), pp. 1-32.

Smith, David E., History of Mathematics, Vol. 1 (Boston, Mass.: Ginn & Co., 1951).

Swanson, G.A., "Accounting Information Can Be Used for Scientific Investigation," Behavioural Science, Vol. 32 (1987), pp. 81-91.

Thornton, D.B. "R.V. Mattessich, Modern Accounting Research: History, Survey and Guide," (A Review Article). Contemporary Accounting Research, Vol. 2, No. 1 (Fall, 1985), pp. 124-142.

Tryon, Edward P., "Is the Universe a Vacuum Fluctuation?" Nature, Vol. 246, (Dec. 1973), pp. 396-397.

Vallat, F. "The Most Ancient Script of Iran: The Current Situation." World Archeology (February 1986), pp. 335-347.

Willett, R.J. "An Axiomatic Theory of Accounting Measurement," Accounting and Business Research (Spring 1987), pp. 155-171.

Text to

Table I and Exhibits 1 to 6

Illustrations of Clay Tokens and Token Accounting Systems from Susa, Iran ca. 3350-3200 B.C.

Exhibits: courtesy Musee du Louvre, Department des Antiques, kindly put at the author's disposal by Professor Denise Schmandt-Besserat, University of Texas at Austin).

Tables:

Table I -- Number words if the Tsimshians of British Columbia

Exhibits:

1. Plain clay tokens

2. Clay envelope (showing seal on surface) with five clay spheres.

3. Clay envelope (showing traces of seal as well as impressions of hardened tokens) with tokens.

4. Complex clay tokens.

5. Sketched reconstruction of a string aggregate (showing clay seal on top and five perforated ovoid tokens on string) -- designed by Prof. Schmandt-Besserat.

Table I

Number	Men	Canoes	Long Objects	Flat Objects	Round Objects	Measures	Counting
1	k'al	k'amaet	k'awutskan	gak	g'erel	k'al	gyak
2	t'epqadal	g'alpeeltk	gaopskan	t'epqat	goupel	gulbel	t'epqat
3	gulal	galtskantk	galtskan	guant	gutle	guleont	guant
4	tqalpqdal	tqalpqsk	tqaapskan	tqalpq	tqalpq	tqalpqalont	tqalpq
5	kcenecal	kctoonsk	k'etoentskan	kctonc	kctonc	kctonsilont	kctonc
6	k'aldal	k'altk	k'aoltskan	k'alt	k'alt	k'aldelont	k'alt
7	t'epqaldal	t'epqaltk	t'epqaltskan	t'epqalt	t'epqalt	t'epqaldelont	t'epqalt
8	yuktleadal	yuktaltk	ek'tlaedskan	yuktalt	yuktalt	yuktaldelont	guandalt
9	kctemacal	kctemack	kctemaetskan	kctemac	kctemac	kctemasilont	kctemac
10	kpal	gy'apsk	kpeetskan	gy'ap	kpeel	kpeont	gy'ap

Table I. The Tsimshians of British Columbia used these various number words according to whether they were counting men, canoes, long objects, flat objects, round objects or time; measures and any other item. The use of different numeration systems to count different items is called "concrete counting." Reproduced from Schmandt-Besserat (1984), p. 50.

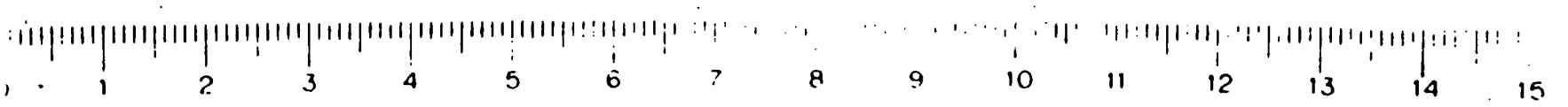


Exhibit 1

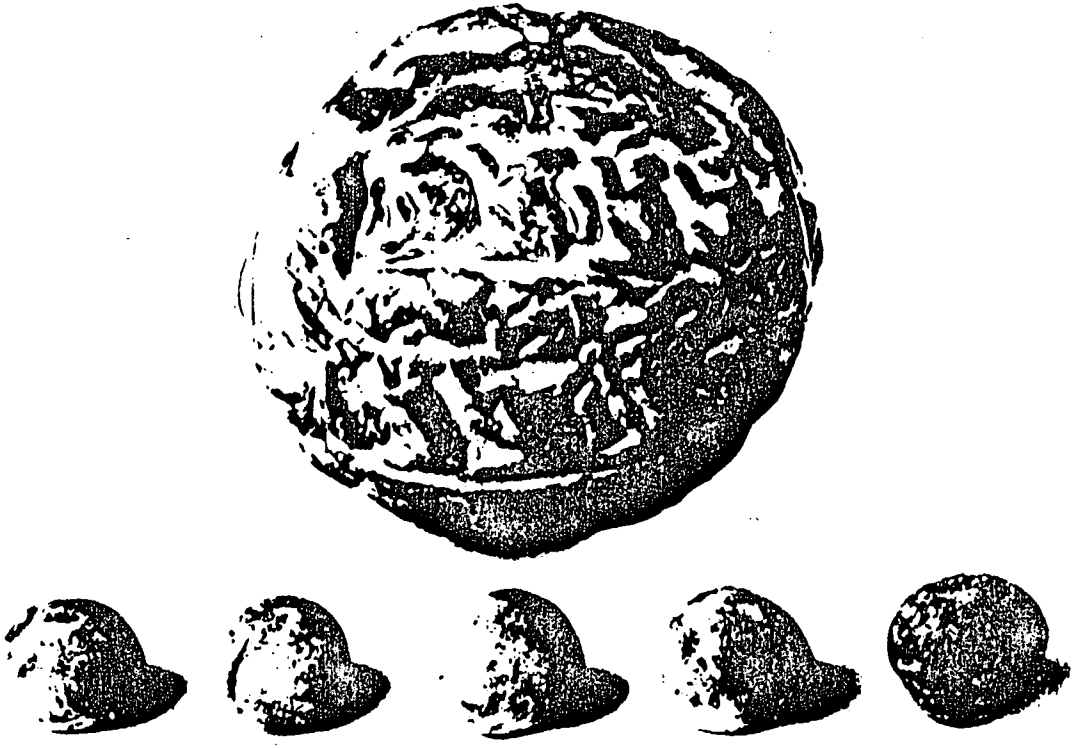


Exhibit 2

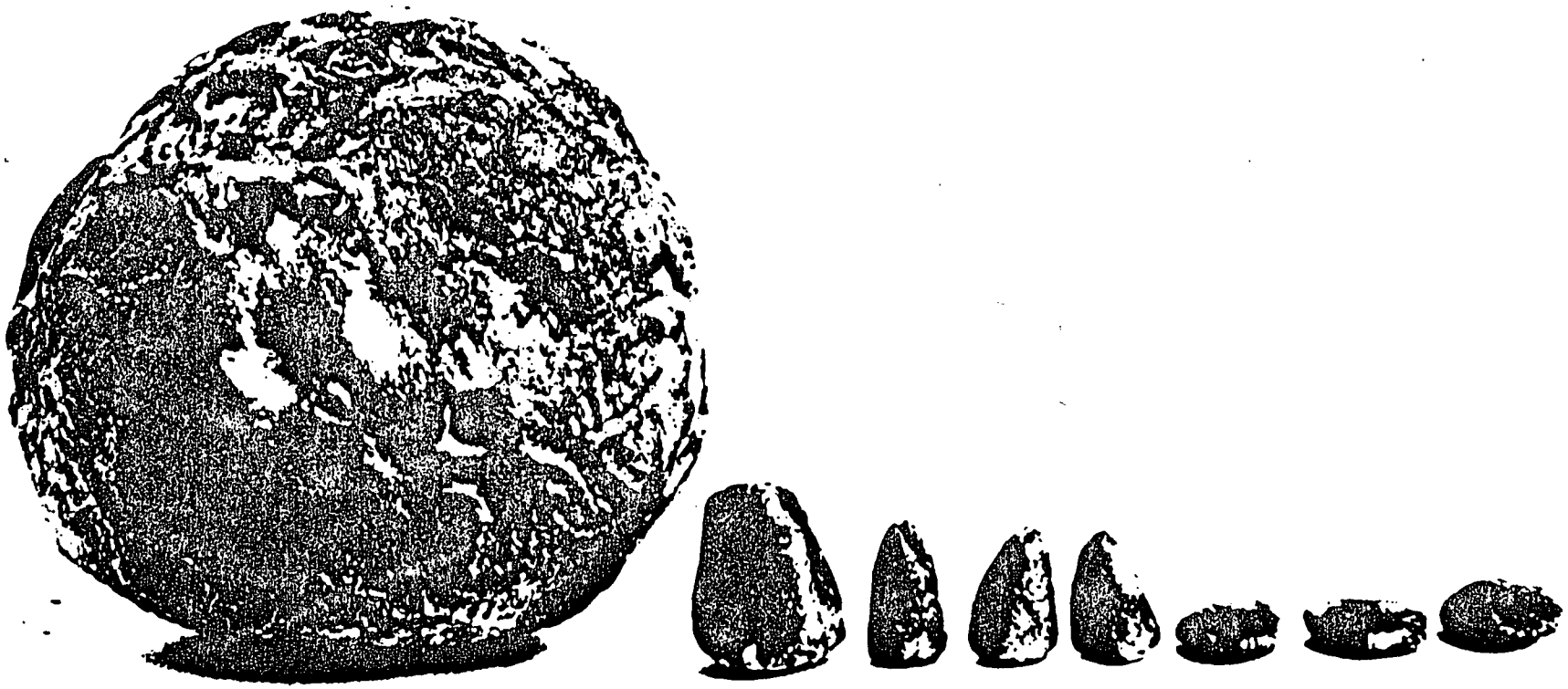
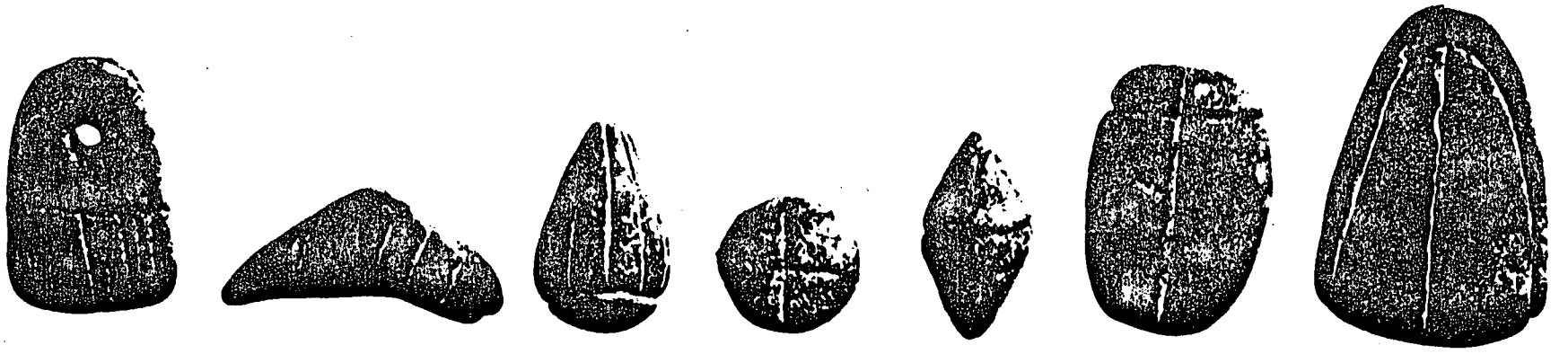


Exhibit 3



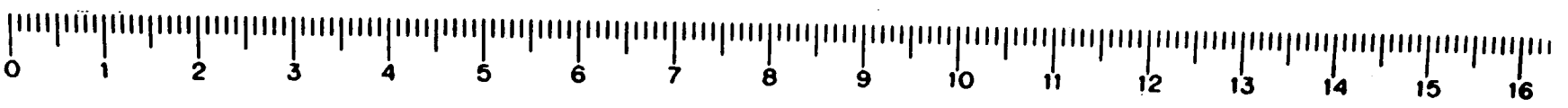
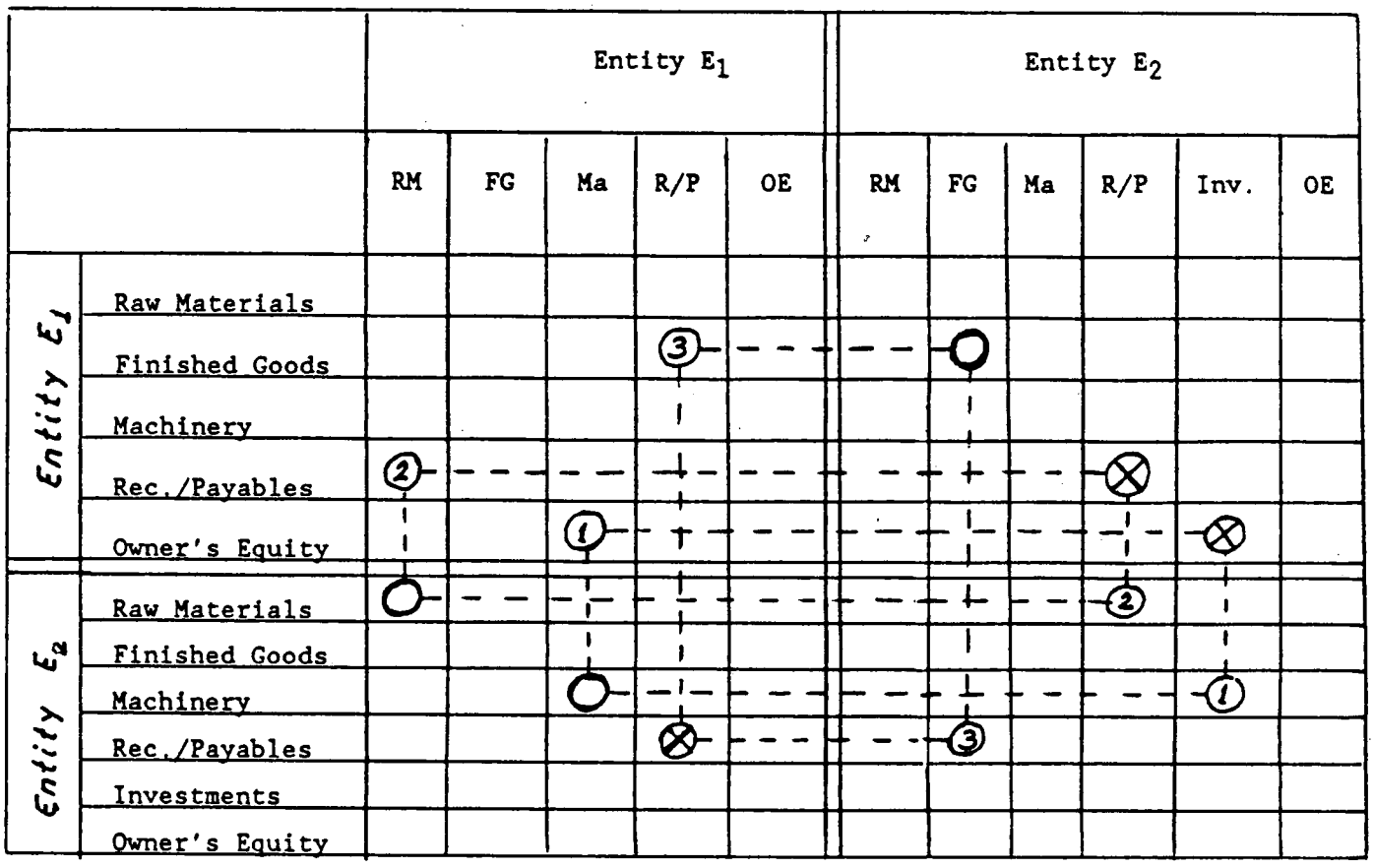


Exhibit 4

EXHIBIT 6



Accounting Matrix of Two Entities with Inter-Entity as Well as Intra-Entity Flows.

THE DISCLOSURE OF TAX LOSS CARRYFORWARDS AND THEIR SUBSEQUENT REALIZATION

BY

CLAUDE P. LANFRANCONI
ASSOCIATE PROFESSOR
THE UNIVERSITY OF WESTERN ONTARIO
(519) 661-3225

and

DARROCH A. ROBERTSON
ASSISTANT PROFESSOR
THE UNIVERSITY OF WESTERN ONTARIO
(519) 661-3216

SCHOOL OF BUSINESS ADMINISTRATION
THE UNIVERSITY OF WESTERN ONTARIO
LONDON, ONTARIO

THE DISCLOSURE OF TAX LOSS CARRYFORWARDS AND THEIR SUBSEQUENT REALIZATION

INTRODUCTION

Due to the pending review of current accounting standards for income tax in Canada, and the upcoming release of a revised accounting standard for income tax in the U.S., the measurement and disclosure of income taxes is of particular interest. This paper focuses on one aspect of accounting for taxes; note disclosure of loss carryforwards and their subsequent realization[1]. It has three specific objectives:

1. to examine the nature and extent of financial statement note disclosure relating to loss carryforwards,

2. to determine the frequency of extraordinary items indicating the realization of previously unrecognized loss carryforwards, and

3. to make recommendations for additional or different disclosure.

The realization of loss carryforwards can have a material impact on both cash flows and income measurement; however, assessment of this potential impact requires knowledge of the amount of the unrecognized and unrealized tax loss carryforward. In a recent study to determine and understand the future cash impact of deferred taxes it became apparent that the current measurement and disclosure requirements and practices of tax loss carryforwards was deficient (Robertson, 1987).

An important criteria justifying a request for additional financial statement disclosure is that it should be made within a context of usefulness. By usefulness we mean meeting user informational needs, and we accept as reasonable the current notion of estimating the amount, timing and uncertainty of future cash flows (FASB, 1978). Also, for economic reasons, the

---

[1] It would be logical to include descriptive data on the use of virtual certainty as it is closely connected to this topic. However, only one company in the sample, Waferboard Corporation Limited, specifically mentioned that an asset for loss carryforwards had been recorded. In 1980 and 1981 the company set up an asset totalling $1,853,386 for potential future tax benefits because "management is of the opinion that there is virtual certainty of utilizing these losses in the carry forward years." (Annual Report 1981). In 1982 the benefit was realized when a part of the company's plant burned down and they realized a gain of the insurance proceeds. As the fire occurred almost five months after the year-end, the insurance proceeds could not have been the basis for virtual certainty.

data should not generally be available from other sources or be capable of being determined at a lower cost by analysis of currently available data.

Before proceeding to the analysis a brief review of the current accounting standards and practices for loss carryforwards will be undertaken.

ACCOUNTING STANDARDS FOR TAX LOSSES

The terms unrealized, realized, unrecognized and recognized will be used extensively in this paper. Unrealized refers to the available loss carryforward for income tax purposes that exists at any point in time. The unrealized amount has the potential of reducing future cash flows to government if the company generates taxable income in the carryforward period. The term unrecognized refers to the loss carryforward that exists for accounting purposes. It may differ from the unrealized figure existing for tax purposes if the company has recognized some of the loss by drawing down deferred income taxes or setting up an asset for virtual certainty.

During the time period of study, a loss for tax purposes had to be carried back one year and if an unclaimed portion of the loss remained it was carried forward for a period of five years[2]. Because the realization of a loss carryforward is uncertain, the Handbook has a series of rules to guide the accounting. If a company meets the conditions of "virtual certainty" it may set up an asset to reflect the future benefit of the loss carryforward. If it chooses not to, or does not meet the criteria for virtual certainty, then the company would turn to paragraph 3470.48 of the Handbook.

> In situations where conditions relating to virtual certainty of realization are not otherwise present, the unrecorded tax benefit of the loss carryforward should be recognized to the extent of any reductions in accumulated deferred income tax credits available in the carryforward period by claiming less capital cost allowances than depreciation recorded or making other adjustments of a similar effect. The amount of the reductions recognized in the period in which the loss occurs should be reflected in the income

---

[2] The revised tax law (effective in 1983 for public companies) provides for a three year carryback and a seven year carryforward. Also, there is no longer a requirement that the loss be carried back before it can be carried forward. This does not affect the relevance of the findings. In fact, the longer time period might make it more likely that the accounting and the cash impact will not coincide.

> statement before "income before extraordinary items" or, if it relates to an extraordinary item, as a deduction therefrom. It should be reflected in the balance sheet as a reduction of accumulated deferred income tax credits. (emphasis added)

This paragraph implies that the company is required to draw down accumulated deferred income taxes by the lessor of the following three items.

1. The amount of loss carryforward multiplied by the average rate of accumulation of the deferred income taxes.

2. The amount of accumulated deferred income taxes, and

3. the anticipated reversals in the carryforward period multiplied by the average rate of accumulation of the deferred income taxes.

If, after completing these steps, the company still has any unrecognized loss carryforward remaining it should[3] disclose this fact in the notes to the financial statements together with the date of expiry of the unrecognized loss carryforward(s). Therefore, there is no requirement for disclosure of a tax loss carryforward whose benefit has been fully recognized in the accounts. If, and when, an unrecognized loss carryforward is realized the CICA Handbook requires that it be shown as an extraordinary item on the income statement.

> "The realization or partial realization in a subsequent period of the tax benefit resulting from a loss carryforward, which was not recognized in the period in which the loss occurred, would be reflected in the income statements for the periods of realization as an extraordinary item." (paragraph 3470.55)

When a loss carryforward is realized, that was previously recognized by drawing down deferred income taxes, "the deferred income tax credits would be re-instated to the extent that the anticipated reversal of timing differences does not occur." (3470.47).

In summary, it is only the unrecognized portion of a loss carryforward that may eventually have an impact on the income statement in subsequent years, and only the unrealized portion that will have an impact on subsequent cash flows. If a financial statement user was interested in future cash flows they would want to know the unrealized loss carryforward, that

---

[3] The word "should" is based on Handbook terminology.

is, the loss carryforward for income tax purposes. If, however, the user was interested in future income statement impacts, they would wish to know the unrecognized loss carryforward, that is, the accounting loss carryforward.

SAMPLE SELECTION

The sample, which consists of 80 randomly selected public companies, was selected for a broader study of accounting for deferred income taxes (Robertson, 1987). Companies continuously listed on the Toronto Stock Exchange from January 1, 1980 to December 31, 1983 were determined, and 233 were randomly selected. From the 233 companies, the following eliminations were made:

1. Companies not following Canadian generally accepted accounting principles.

2. Companies not following tax allocation accounting.

3. Companies from any of the following industries:
    a. financial institution,
    b. real estate,
    c. oil and gas, and
    d. mining.

4. Companies with less that 70% of revenue or identifiable assets in Canada.

Consideration of the Time Period of Investigation

The period investigated was the four year period from 1980 through 1983. As the early part of the 1980s was a recessionary period, particularly 1982 and 1983, companies frequently incurred losses. It was anticipated that unrecognized loss carryforwards would be more numerous than in prior time periods. It is not known what bias this time period may have on the recording of extraordinary items for the realization of previously unrecognized loss carryforwards. An increase in the number of loss carryforwards increases the potential for these extraordinary items to occur, but at the same time the more frequent losses would decrease the probability of these extraordinary items.

NOTE DISCLOSURE RELATING TO LOSS CARRYFORWARDS

The first objective of this paper is to examine the nature and extent of note disclosure relating to loss carryforwards and our ability to interpret the loss carryforwards. To accomplish this objective the following questions will be investigated.

1. How many sample companies provide disclosure of the existence of recognized, unrecognized, realized or unrealized tax loss carryforwards?

2. Are the expiry dates always provided?

3. Is the loss carryforward that is disclosed the accounting figure, the tax figure, or both?

4. To what extent are the subsequent recognition or realization clearly identifiable?

Disclosure of Loss Carryforwards

Table 1[4] summarizes the number of sample observations disclosing the existence of a loss carryforward. It is apparent that the disclosure of loss carryforwards was not an unusual occurrence during the early 1980s. In 1980 and 1981 fourteen companies (17.5 percent of sample) disclosed the existence of a non-capital loss carryforward. This jumped to 23 (28.8 percent of sample companies) in 1982, where it remained for 1983.

INSERT TABLE 1 HERE

The net increase of nine companies disclosing a non-capital loss carryforward between 1981 and 1982 was composed of ten new companies and the deletion of one company that appeared to have realized all of its loss carryforward.[5] Of the ten new additions in 1982, nine had a credit on their income statement for deferred income taxes. The other company had an income statement buildup in deferred income taxes but its loss carryforward related to a subsidiary it purchase in the year. This analysis indicates that drawdowns of deferred income tax to recognize losses did not appear to be sufficient to offset the full amount of the loss carryforward in many cases.

The disclosure of capital loss carryforwards are less frequent and as they can not typically be recognized by drawing down deferred income taxes they are not of great significance to this study. The increase in the number of investment tax credit carryforwards is consistent with the increase in the number of loss carryforwards.[6] With the introduction of Section 3805 of

---

[4] Tables are provided at the end of the paper.

[5] The use of the word "appeared" is necessary as there is no current requirement to disclose that any portion of a loss carryforward has expired without being realized.

[6] Generally, investment tax credits can not be claimed unless the company has taxable income.

the CICA Handbook it will be interesting to see the level of this disclosure after 1984 as the new section permits the recording of the benefit of this tax credit only when the company has reasonable assurance of realizing it. This is a much less stringent test than the virtual certainty requirements which currently exists for recording the benefit of a loss carryforward as an asset.

Disclosure of Expiry Dates

In general, sample companies disclosing a loss carryforward provided the expiry dates of the losses. However, one company in 1980, two in 1981 and two in 1983 did not provide disclosure of the expiry dates where it appeared they should have. In addition, one company in 1981 and 1982 and another company in 1983 only disclosed the time period over which the loss expires, without specifying the amount expiring in each year.

Nature of Loss Being Disclosed

As was mentioned earlier, companies are only required to disclose the portion of a tax loss carryforward that has not been recognized in the financial statements. Lanfranconi and Robertson (1984), in an earlier investigation of the area, found that the notes dealing with loss carryforwards were not clear and that it was not always possible to determine if the loss carryforward figure being disclosed was the tax figure (unrealized) or the accounting figure (unrecognized). While these two figures may be the same, it is possible that they are substantially different if the company has recognized some of the loss carryforward by either drawing down deferred income taxes or setting up an asset for virtual certainty..

Table 1 indicated 74 observations disclosed a non-capital loss carryforward. The financial statement notes of these 74 observations were reviewed to establish whether the notes were disclosing the loss carryforward for income tax purposes, the loss carryforward for accounting purposes or both.

Considerable difficulty was encountered in classifying the notes because of their wording, particularly the joint use of the terms "tax loss carryforward" and "unrecognized".

The results (Table 2) are surprising even given the potential margin of error in classification. Only 12 observations appeared to be disclosing the accounting loss carryforward, while 47 observations appear to be disclosing the loss carryforward that exists for tax purposes. The fifteen other observations provided both the accounting and tax loss carryforward with six of these observations indicating that no accounting loss carryforward existed.

INSERT TABLE 2 HERE

Accepting the classification of Table 2 as reasonable based on the disclosure provided, there is a potential departure from the recommendations of the CICA Handbook for 47 observations disclosing only the tax loss carryforward (ie. the unrealized amount).[7] What are the potential explanations for this?

1. It is possible that the tax and accounting loss carryforward figures are the same. This could occur if the company has not recognized any of the benefit of the loss carryforward due to either:

   a. having no deferred income tax to draw down, or

   b. deciding that they do not wish to draw down deferred income taxes to recognize the loss carryforward.

2. A belief on the part of management that the accounting loss carryforward figure is not relevant to users' needs.

3. Disclosure of a tax loss when no accounting loss exists, without informing the reader of this.

4. Poor wording of the notes leading to misclassification by the researchers.

5. Lack of materiality of the amounts.

The extent of these explanations can not be established, but in the case of points 1b, 3 and 4 the possibility can be shown by reviewing some examples of the sample company note disclosure.

Examples from Practice

Example One: The possibility of a company deciding that they do not wish to draw down, or have not drawn down, deferred income taxes is provided by the following accounting policy note from White Pass and Yukon Corporation Limited.

> Potential tax reductions that may result from the application of losses against future taxable income are not recognized unless recovery out of future taxable income is virtually certain. (Annual Report 1983)

The note for 1980-82 was basically the same. As the accumulated deferred income taxes was $7,071,000 (6.4 percent of total assets) in 1983 the note indicates a potential

---

[7] If any departures do exist they appear to be condoned in practice as none of the companies received a qualified audit report.

inconsistency between practice and paragraph 3470.48 of the Handbook.

As mentioned earlier in this paper, paragraph 3470.48 states in part that "the unrecorded tax benefit of the loss carryforward should be recognized to the extent of any reductions in accumulated deferred income tax credits available in the carryforward period by claiming less capital cost allowance than depreciation recorded..."

Example Two: An example of a company disclosing a tax loss carryforward when there is likely no accounting loss carryforward is provided by Simpson-Sears Limited. For the year ended February 2, 1983, one of Simpson-Sears' notes indicated a $20 million tax loss carryforward and that the associated tax benefit of $10,364,000 had been recognized by reducing accumulated deferred income taxes by this amount. This note was classified as disclosing a tax loss carryforward when no accounting loss carryforward exists.

In the next annual report for the 48 week period ending December 31, 1983 the note stated:

> As at December 31, 1983, the company and certain subsidiaries had losses for income tax purposes of approximately $18 million available to reduce taxable income over their next six fiscal years.

Based on the wording, the 1983 note was classified as disclosing a tax loss carryforward with no information regarding an accounting loss carryforward. However, when one considers the prior year's note, it appears that the 1983 note is describing a tax loss carryforward when no accounting loss carryforward exists. This lack of consistency may lead a reader of the December 31, 1983 annual report to conclude that there is also an equal accounting loss carryforward.

Example Three: An example of a note that may have been incorrectly classified as disclosing a tax loss carryforward is that of Lambda Mercantile Corporation, in its June 30, 1983 financial statements.

> Non-capital loss carry-forwards for tax purposes which have not been recognized in these financial statements are approximately $97,000. The tax benefit of these loss carry-forwards is available until:
>
> | | |
> |---|---|
> | 1987 | $75,000 |
> | 1990 | $22,000 |
> | | $97,000 |

Upon first reading, it appears that the note may be referring to both an accounting and a tax loss carryforward as the note states "which have not been recognized in these

financial statements". However, by looking at next year's notes one discovers an extraordinary gain of $47,654 for the "Tax benefit of a non-capital loss carry-forward" and an extraordinary loss of $42,000 for "Deferred taxes of prior years reinstated". The $47,654 would represent the realization of the non-capital loss carryforward, and we suspect that the $42,000 reinstatement of deferred income taxes is consistent with paragraph 3470.47, which suggests that anticipated reversals that do not occur should be re-instated. This would be re-instating accumulated deferred taxes for tax loss benefits realized and previously recognized. Assuming this is the case, and because there is no further disclosure on non-capital loss carryforwards, we suspect that the note to the 1983 financial statements was actually disclosing the total tax loss carryforward and not both. However, in our own discussions of this company's notes, we did generate other plausible interpretations.

Summary: The three examples described above indicate a lack of clarity of even inconsistency in note disclosure. This could result in users having difficulty in comparing note disclosure between companies as well as assessing the implications of this disclosure in a single company.

SUBSEQUENT REALIZATION OF LOSS CARRYFORWARDS

The second objective of this paper is the determination of the frequency of extraordinary items indicating the recognition and realization of previously unrecognized loss carryforwards. To determine this, we reviewed all extraordinary items for the sample companies, not just those companies disclosing a loss carryforward.

INSERT TABLE 3 HERE

Table 3 indicates that 48 observations had an extraordinary item relating to loss carryforwards. Thirteen occurred in both 1980 and 1981, seven in 1982 and 15 in 1983. The data on the mean dollar value, mean percent of current tax expense and mean percent of net income indicates that these extraordinary items are material for the companies having them.

INSERT TABLE 4 HERE

As may have been expected, the occurrence of the extraordinary items for realization of loss carryforwards was not evenly distributed over the sample companies. Instead, as Table 4 indicates, the 48 extraordinary items were spread over 22 companies, with five companies having one in each of the four years investigated, two companies had three, seven companies had two and eight companies had only one.

ASSOCIATION OF CURRENT TAX EXPENSE AND EXTRAORDINARY ITEMS

This section investigates the potential disclosure difficulties due to the Canadian government's prohibition on consolidated tax returns. The reason for considering this issue is to determine if losses are being trapped in one legal entity. If this is the case, there is the normative question of whether the fact that the business segment maybe unable to benefit from the loss should be disclosed to financial statement readers if they are to predict the potential cash impact.

If a single legal entity has an accounting loss carryforward, we would expect that the reporting of a positive current tax expense would coincide with the reporting of an extraordinary item representing the realization of the loss carryforward. However, when we have to deal with consolidated financial statements this relationship may well disappear and lead to difficulty in understanding the financial impact of the losses. To analyze this issue, cross-tabulations of the sign of companies' current tax expense and the realization of loss carryforwards were prepared and are presented in Table 5.

INSERT TABLE 5 HERE

Only those companies having an extraordinary item for the realization of a loss carryforward or disclosing the existence of a loss carryforward at year-end are incorporated in Table 5. The upper portion of the table indicates that the occurrence of negative current tax expense does not eliminate the possibility of realizing a loss carryforward. The middle portion of the table represents those companies reporting positive current tax expense. It indicates that the occurrence of positive current tax expense does not necessarily lead to the recording of an extraordinary item for realization of a loss carryforward. The bottom section of Table 5 considers the companies that did not have any current tax expense. When a company reports zero current tax expense one would not expect to find an extraordinary item for the realization of a loss carryforward on the company's income statement. This expectation is supported by the data.

The primary conclusion is that due to the prohibition on consolidated tax returns in Canada the realization of loss carryforwards does not necessarily parallel that which would occur in a single legal entity. If a user is provided with information that a company has a loss carryforward and is going to incur current tax expense the user can only guess as to whether the loss carryforward will reduce the company's cash outflows since the loss may be trapped in a consolidated subsidiary unable to realize the benefits by generating a taxable income. The segmented data now provided would fall short of satisfying a users requirements to make predictions as there is no requirement to disclose which segment the loss carryforward relates to.

SUMMARY

This paper set out to describe the notes to companies' financial statements dealing with loss carryforwards and their subsequent realization. It was shown that from 1980 through 1983, note disclosure of loss carryforwards was frequent and so was the subsequent realization of these losses.

Two major problem areas were identified. The first dealt with the lack of clarity and possible inconsistency in the disclosure of loss carryforwards. Several companies did not disclose the existence of a loss if it had been recognized which is consistent with the CICA Handbook. However, when a unrecognized loss carryforward existed there appeared to be a tendency to disclose the tax figure. In addition, the wording made it difficult to determine which figure was actually being disclosed.

The second issue of concern is the lack of adequate information on the segment of the business with the loss. Without additional data it is difficult to establish the likelihood of the eventual realization of the benefit and the corresponding impact on net income and cash flows.

RECOMMENDATIONS

One possible view of loss carryforwards is that they are contingent gains. That is, the tax shielding benefit of the loss carryforward will be resolved by a future event; whether or not the company earns sufficient income prior to its expiry. We believe this view of a loss carryforward is appropriate. This would imply that the setting up of an asset for virtual certainty should no longer be permitted, as Section 3290 of the CICA Handbook does not permit the accrual of contingent gains. In addition, this view would suggest that a loss carryforward that is likely to be realized be noted, as well as one where the probability of realization is not determinable[8]. However, if it is unlikely, particularly with the prohibition on consolidated tax returns in Canada, that the accounting loss carryforward will be realized, the amount should not be disclosed, so as to avoid drawing unwarranted attention to it.

For loss carryforwards that will be disclosed in the notes, we believe that both the amount of the loss carryforward for tax purposes and the loss carryforward for accounting purposes

---

[8] While the CICA Handbook states that it **may be desirable** to disclose a contingent gain where the probability of realization is not determinable, we believe that disclosure in such a situation should be required and not left to managements' discretion.

should be provided[9]. This is based on our assumption that financial statement users are interested in both the future income and future cash flow impact of loss carryforwards. In addition, the disclosure of both loss carryforward figures would likely eliminate much of the interpretational problems the researchers encountered in analyzing the notes.

As current accounting practice does not normally require disclosure of financial data relating to a single legal entity in a consolidated group, it would be inappropriate to require disclosure of the existence of loss carryforwards by legal entity. However, serious consideration should be given to disclosure of loss carryforwards that exist for any identifiable business segment.

---

[9] This recommendation is consistent with one contained in the November 17, 1986 exposure draft Accounting for Income Taxes issue by the Financial Accounting Standards Board.

TABLE 1

Number of Observations Disclosing
Various Types of Tax Loss Carryforwards

Type of Loss Carryforward	Number of Observations Disclosing 1980	1981	1982	1983
Non-capital loss	14	14	23	23
Capital loss	2	3	3	3
Investment tax credit	1	4	10	11
Unrecorded Deferred Tax Debits	4	5	7	4

Notes: 1. In all years the sample size was 80.

2. Companies are represented in more than one category in any particular year.

TABLE 2

Classification of Researcher's Best Interpretation
of the Type of Loss Carryforward Described in the
Notes to the Financial Statements

	1980	1981	1982	1983	Total
Accounting loss	1	2	5	4	12
Tax loss	9	9	13	16	47
Both	3	2	2	2	9
Tax loss but no accounting loss exists	1	1	3	1	6
Total number of companies disclosing existence of non-capital loss carryforward	14	14	23	23	74

Note: 1. The term "best interpretation" is used due to the ambiguity the researcher found in the wording of the notes.

TABLE 3

Occurrence of Extraordinary Item for Realization of the Benefit of a Loss Carryforward

	1980	1981	1982	1983
Number of Extraordinary Items	13	13	7	15
Mean Dollar Value (000's)	970	490	366	404
Mean Percent of Current Tax Expense	25.3	44.4	44.1	47.1
Mean Percent of Net Income	19.6	16.6	15.2	22.5

TABLE 4

Frequency of Extraordinary Item for Loss Carryforward by Company

Number of Companies	Years of Extra-ordinary items	Total
5	4	20
2	3	6
7	2	14
8	1	8
22		48

TABLE 5

Classification of Companies With Either a Disclosed Loss Carryforward at Yearend and/or an Extraordinary Item Indicating Realization of a Loss Carryforward

		Companies Having Negative Current Tax			
		1980	1981	1982	1983
Extraordinary Item for Loss Carryforward	YES	2	1	0	0
	NO	1	0	6	0

		Companies Having Positive Current Tax			
		1980	1981	1982	1983
Extraordinary Item for Loss Carryforward	YES	11	12	7	15
	NO	2	4	7	8

		Companies Having Zero Current Tax			
		1980	1981	1982	1983
Extraordinary Item for loss carryforward	YES	0	0	0	0
	NO	2	1	4	3

BIBLIOGRAPHY

Canadian Institute of Chartered Accountants, CICA Handbook (Canadian Institute of Chartered Accountants: Toronto, Canada 1983).

FASB, Accounting for Income Taxes (Financial Accounting Standards Board: Proposed Statement of Financial Accounting Standards: Stamford, Conn. 1986).

FASB, Objectives of Financial Reporting by Business Enterprises (Financial Accounting Standards Board: Statement of Financial Accounting Concepts No.1: Stamford, Conn. 1978).

Lanfranconi, C.P. and D.A. Robertson, "The Behaviour and Disclosure of Deferred Taxes in a Recessionary Environment," in Proceedings, 1984 Annual Conference of the CAAA (Canadian Academic Accounting Association: Toronto, Canada 1984) pp.134-159,

Robertson, D.A., "An Investigation of Deferred Income Taxes During a Recession," (unpublished Ph.D. dissertation, The Universtiy of Western Ontario 1987).

CURRENT TRENDS IN NONLEGAL TAX RESEARCH

CHARLES W. SWENSON CPA,PhD
ASSISTANT PROFESSOR OF ACCOUNTING
SCHOOL OF ACCOUNTING
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES, CA. 90089-1421

PREPARED FOR PRESENTATION AT THE:
CANADIAN ACADEMIC ACCOUNTING ASSOCIATION MEETINGS

WINDSOR, ONTARIO, CANADA
JUNE 2, 1988

CURRENT TRENDS IN NONLEGAL TAX RESEARCH

This paper was written specifically for presentation at the June 2, 1988 Canadian Academic Accounting Association Annual Meetings. The purpose of the paper is to introduce the reader to recent trends in nonlegal tax research by American authors, and most of the references are four years old or less. For American non-legal tax research before 1984 the reader is referred to Kramer[1984] and the attached (select) references used as part of PhD seminar which I taught. This paper addresses recent trends in methodologies, theories, and topics in that order. It does not purport to be complete and consequently only select references are given under each topic.

METHODOLOGIES

Financial accounting research has been characterized by its use of current advances in econometric methods. Recently tax research has adopted econometric techniques. Early tax research utilized econometric methods for court-case analysis; usually these methods were variants of the general linear model utilizing normally-distributed response variables (ordinary least squares regression) or categorical response variables (probit, logit, and discriminant analysis). More recent research has used the following techniques. Madeo and Pincus[1985] utilized a simultaneous equations model(Zellner's seemingly unrelated regression procedure) to analyze security market responses to a tax law change. Moore, Steece, and Swenson[1985] utilized Box-Jenkins time series analysis to examine taxpayer rationality in response to a tax law change. Swenson and Moore[1987] utilized input-output analysis to examine higher-order effects of tax incidence. Given the increasing methodological capabilities of new tax PhD's I expect the use of new econometric techniques to continue.

A new and exciting methodology is experimental economics(EE). Utilizing theory from economics but done in a laboratory environment, the method has seen expansive growth with most EE work in economics published in the last dozen years, in (non-tax) accounting in the last five years, and in tax the last two years. Although some EE work looks at individual choice, the bulk has been laboratory markets where buyers and sellers of some commodity bid, offer, and contract. EE is characterized by salient reward structures for participants, with pay rates ranging from $6- $20 per hour. For an overview of this method in tax the reader is referred to Davis and Swenson[1988]. To date five studies have used EE in tax. Swenson[1988] examined labor supply and tax payments (The "Laffer Curve") in response to tax rate changes. King and Wallin[1988] looked at portfolio choice under proportional and progressive tax regimes from an individual choice perspective. Swenson[1987] had previously examined the same issue in an experimental market. Meade[1987]

experimentally examined the capital gains lock-in effect and several proposals to eliminate the lock-in effect. Hamill[1988} used laboratory markets to test, competing theories of the sensitivity of nominal interest rates to inflation and to proportional taxes, where taxes are applied to financial asset gains and/or real asset gains. The EE method seems extremely well-suited for tax research, and as more researchers become knowledgeable in it, the method's use will expand rapidly.

In the use of "traditional" laboratory research (ie, where underlying theory is from the psychology/sociology paradigm), a recent advance is the use of jurors as subjects. The advantage is in external validity; jurors are (somewhat randomly-sampled) more representative of the actual taxpaying population than are student surrogates. The first use of jurors was by Milliron[1985] who examined taxpayers perceptions of fairness and tax law complexity. Subsequent to Milliron, Hite[1988] examined the effect of peer reporting behavior on taxpayer compliance using jurors.

In analytic methods, with the exceptions of Wolfson and his coauthors and Halperin and his coauthors, relatively little research has been done by tax accounting researchers. Some recent advances are the use of dynamic programming [Halperin,1983]. As tax researchers become more well-versed in a priori theory-building and analytic methods we may see more advances in analytic methods.

THEORIES

In the tax compliance area, two recently emerging theories are game theory and equity theory. Game theory views the taxpayer and the Internal Revenue Service (IRS) as playing a sequential period adversarial game until a compliance/auditing strategy sequential or Nash equilibrium occurs; see the pioneering work of Graetz [1985]. Equity theory was first used by Spicer and Becker[1980] to examine subjects' propensity to evade taxes as a function of perceived inequities in terms of trade with the government.

Capital markets-based theories, heavily used by financial accounting researchers in the past, have recently been used in tax research. Studies such as Bathke, Rogers, and Stern[1985], Madeo and Pincus[1985] and Manegold and Karlinsky[1988] examined market price reactions to tax law changes. The principal-agent model has drawn from similar theory in economics to examine incentive-compatible contracts in the presence of taxes; see Fellingham and Wolfson[1985] and Wolfson[1985]. The positive approach to agency theory has been used to underpin studies of management's use of R&D limited partnerships [Shevlin,1988]. The economic interest group theory has been recently advanced to explain differences in corporate tax rates [Cassil,1987]. Finally, the ideas of implicit taxes are the tax clientele

hypothesis have been proposed by Mazur [1986].

TOPICS

The following appear to among likely popular research topics in the near future.

1. The new alternative minimum tax, especially its effects on financial accounting.
2. The role of the tax preparer (accountant) in tax evasion and avoidance.
3. Various provisions of the Tax Reform Act of 1986
4. Tax policy with respect to capital gains
5. Tax policy with respect to R&D
6. The role of political influence and the formation of tax law
7. The interactive roles of the I.R.S. and the taxpayer in tax compliance.

SELECTED REFERENCES

Bathke, A. R. Rogers and J. Stern, "The Security Market Reaction To Tax Legislation As Reflected In Bond Price Adjustments." The Journal of The American Taxation Association (Spring 1985) pp. 37-49.

Cassill, A. "The Influence of Pac Contributions Upon Industry Tax Burdens: An Empirical Analysis." Mimeo, University of North Carolina at Greenburo, 1987.

Davis, J. and C. Swenson, "The Role of Experimental Economics in Tax Policy Research" Journal of the American Taxation Association (Forthcoming, Fall 1988)

Fellingham, J. and M. Wolfson, "Taxes and Risk-Sharing." The Accounting Review, January 1987.

Graetz, M., J. Reingenum and L. Wilde, "The Tax Compliance Game: Toward an Interactive Theory of Law Enforcement" Journal of Law, Economics, and Organization, (Spring 1986) pp. 1-32.

Halperin, R., "The Perceived Instability of Tax legislation and its effect on Consumption-Investment Decisions" Journal of Accounting Any Public Policy, (1983) pp. 239-262.

Hamill, J. "An Experimental Analysis of the Impact of Income Taxes on Nominal Interest Rates" Unpublished PhD dissertation, Arizona State University (1988).

Hite, P., "The Effect of Peer Reporting on Tax Compliance" Journal of the American Taxation Association (Spring 1988) pp. 47-64.

Kramer, J., "Tax Research: Past, Present, and Future." working paper, University of Florida, (1984).

King, R. and D. Wallin, "Individual Risk-Taking, Taxation, and Tax-Like Contracts" Unpublished working paper, Washington University, (1988).

Madeo, S. and M. Pincus, "Stock Market Behavior and Tax Rule Changes: The Case of Disallowance of Certain Interest Deductions." The Accounting Review, (July 1985) pp. 407-429.

Manegold, J. and S. Karlinsky, "The Security Market Impact of a Tax Law Change" Journal of the American Taxation Association, (Spawl 1988) pp. 65-83.

Milliron, V. "A Behavioral Study of the Meaning and Influence of Tax Complexity." Journal of Accounting Research (Autumn 1985) pp. 794-816.

Moore, M., C. Swenson and B. Steece, "Some Empirical Evidence on Taxpayer Rationality." The Accounting Review (Jan. 1985)

Mazur, M., M. Scholes and M. Wolfson, "Implicit Taxes and Effective Tax Burdens." (1986) working paper, Stanford University.

Shevlin, T., "Taxes and Off-Balance Sheet Financing: R&D Limited Partnerships." The Accounting Review, (July 1987).

Spicer, M. and G. Becker, "Fiscal Inequity and Tax Evasion: An Experimental Approach." National Tax Journal (1980)

Swenson, C. "Tax Regimes and the Demand For Risky Assets: Some Experimental Market Evidence." (1987) working paper, University of Southern California.

Swenson, C. and M. Moore, "The Use of Input-Output Analysis in Tax Research." Advances in Taxation (1987)

OTHER REFERENCES - CURRENT NONLEGAL TAX RESEARCH
Compiled from Doctoral Seminar in Taxation taught by C. W. Swenson

Tax Policy - Individuals

Anderson, "A Horizontal Equity Analysis of the Minimum Tax Provisions: An Empirical Study." The Accounting Review, July 1985, pp. 353-371.

Porcano, "Distributive Justice and Tax Policy." The Accounting Review, October 1984, pp. 619-636.

Katz and Mankiw, "How Should Fringe Benefits Be Taxed?" National Tax Journal, XXXVll No. 1, pp. 37-63.

Slemrod and Yitzhaki, "On Choosing A Flat-Rate Income Tax System." National Tax Journal, XXXVl No. 1, pp. 31-44.

Enis and Craig, "The Redistribution of the Income Tax Burden Under A True Flat Tax Structure." Journal of the American Taxation Association, Fall 1984, pp. 20-35.

Tax Policy - Businesses

McClure and Thurske, "A Simplified Exposition of the Harberger Model 1: Tax Incidence." National Tax Journal, XXVlll No. 1, pp. 1-27.

Wheeler and Gaffney, "The Double Taxation of Corporate Source Income: Reality or Illusion?" The Tax Adviser, September 1977, pp. 516-553.

Stickney and McGee, "Effective Corporate Tax Rates: The Effects of Size, Capital Intensity, Leverage, and Other Factors." Journal of Accounting and Public Policy, 1 (1982), pp. 125-152.

Fullerton, "Which Effective Tax Rate?" National Tax Journal, XXXVll No. 1, pp. 23-41.

Porcano, "Corporate Tax Rates: Progressive, Proportional, or Regressive." Journal of the American Taxation Association, Spring 1986, pp. 17-31.

Gravelle, "Effects of the 1981 Depreciation Revisions on the Taxation of Income from Business Capital." National Tax Journal, XXXV No. 1, pp. 1-20.

Schall and Sundem, "The Investment Tax Credit and the Leasing Industry." Journal of Accounting and Public Policy, 1 (1982), pp. 83-94.

Fisher, Lentz, and Stern, "Tax Incentives for Investments In Nonresidential Real Estate." National Tax Journal, XXXVll No. 1, pp. 69-83.

Taxes and Incentives

Fellingham and Wolfson, "The Effects of Alternate income Tax Structures on Risk Taking in Capital Markets." National Tax Journal, XXXl No. 4, pp. 337-347.

Fellingham and Wolfson, "Taxes and Risk Sharing." The Accounting Review, January 1985, pp. 10-17.

Wolfson, "Tax, Incentive, and Risk-Sharing Issues in the allocation of Property Rights: The generalized Lease-or Buy Problem." Journal of Business, 1985 No. 2, pp. 159-171.

Eisner and Lawier, "tax Policy and Investment: An Analysis of Survey Responses." The American Economic Review, pp. 206-212.

Porcano, "The Perceived Effects of Tax Policy on Corporate Investment Intentions." Journal of the American Taxation Association, Fall 1984, pp. 7-19.

Carman, Moore, and Dean, "Producer Response to Income Taxes: An Empirical Test Within A Risk framework." National Tax Journal, XVVll No. 2, pp. 183-195.

Halperin and Tzur, "Monetary Compensation and Nontaxable Employee Benefits: An Analytical Perspective." The Accounting Review, October 1985, pp. 670-680.

Halperin, "The Perceived Instability of Tax Legislation and Its Effect on Consumption-Investment Decisions." Journal of Accounting and Public Policy, No. 2 1983, pp. 239-262.

Scholes and Wolfson, "Employee Compensation and Taxes: Links with Incentives and with Investment and Financing Decisions." Working paper, Stanford University, 1984.

Hite and Long, "Taxes and Executive Stock Options." Journal of Accounting and Economics, 4 (1982), pp. 3-14.

Stuart, "Swedish Tax Rates, Labor Supply, and Tax Revenues." Journal of Political Economy, pp. 1020-1038.

Lindbeck, "Tax Effects versus Budget Effects on Labor Supply." Economic Enquiry, October 1982, pp. 473-481.

Halperin and Tzur, "The Effects of Nontaxable Employee Benefits on Employer Profits and Employee Work Effort." National Tax Journal, XXXVlll No. 1, pp. 65-79.

Madeo and Madeo, "The Equity and Motivating Effects of the Maximum Tax." Journal of the American Taxation Association, Spring 1984, pp. 40-49.

Reece, "Charitable Contributions: New Evidence on Household Behavior." American Economic Review, March 1979, pp. 142-151.

Enrick, "A Pilot Study of Income Tax Consciousness." National Tax Journal, XVl No. 2, pp. 169-173.

Tax Compliance

Spicer and Lundstedt, "Understanding Tax Evasion." Public Finance, 1976, pp. 295-305.

Song and Yarbrough, "Tax Ethics and Taxpayer Attitudes: A Survey." Public Administration Review, Sept./Oct. 1987, pp. 442-452.

Sandmo, "Income Tax Evasion: A Theoretical Analysis." Journal of Public Economics, Fall 1972, pp. 323-338.

Scott and Grasmick, "Deterrence and Tax Cheating: Testing Interpretation Hypotheses in Utilitarian Theories." Journal of Applied Behavioral Science, No. 3 1981, pp. 395-408.

Friedland, Maital, and Rutenberg, "A Simulation Study of Income Tax Evasion." Journal of Public Economics, 1978, pp. 107-116.

Spicer and Becker, "Fiscal Inequity and Tax Evasion: An Experimental Approach." National Tax Journal, Vol. XXXlll No. 2, pp. 171-175.

Jackson and Jones, "Salience of Tax Evasion Penalties versus Detection Risk." Journal of the American Taxation Association, Spring 1985, pp. 7-17.

Milliron, "A Behavioral Study of the Meaning and Influence of Tax Complexity." Journal of Accounting Research, Autumn 1985, pp. 794-816.

Slemrod and Sorum, "The Compliance Cost of the U.S. Individual Income Tax System." National Tax Journal, XXXVll No. 4, pp.461-474.

Broden, "Ethical Behavior in IRS Tax Practice." Journal of the American Taxation Association, Fall 1980, pp. 19-28.

Eustice, "Tax Complexity and the Tax Practitioner." The Tax Adviser, January 1977, pp. 27-35.

State-Local and International Tax Issues

Wheaton, "Interstate Differences in the Level of Business Taxation." National Tax Journal, XXXVl No. 1, pp. 83-94.

Hewitt and Stephenson, "State Tax Revenues Under Competition." National Tax Journal, XXXVl No. 1, pp. 95-101.

McClure, "The Illusive Incidence of the Corporate Income Tax: The State Case." Public Finance Quarterly, October 1981, pp.395-413.

Hartman, "Tax Policy and Foreign Direct Investment in the United States." National Tax Journal, XXXVl No. 4, pp. 475-487.

Moore, M., B. Steece and C. Swenson, "An Economic Analysis of the Impact of State Taxes on Foreign Investment."

Financial Accounting Research and Taxes

Biddle and Lindahl, "Stock Price Reactions to LIFO Additions: The Association Between Excess Returns and LIFO Tax Savings." Journal of Accounting Research, Autumn 1982, pp. 551-588.

Bathke, Rodgers, and Stern, "The Security Market Reaction to Tax Legislation as Reflected in bond Price Adjustments." Journal of the American Taxation Association, Spring 1985, pp. 37-49.

Zimmerman, "Taxes and Firm Size." Journal of Accounting and Economics, Spring 1983, pp. 119-149.

Madeo and Pincus, "Stock Market Behavior and Tax Rule Changes: The Case of the Disallowance of Certain Interest Deductions Claimed by Banks." The Accounting Review, July 1985, pp. 407-429.

Miscellaneous Topics

Davidson and Well, "Income Tax Implications of Various Methods of Accounting for Changing Prices." Journal of Accounting Research, Supplement 1978, pp. 154-232.

Maher and Nantell, "The Tax Effects of Inflation: Depreciation, Debt, and Miller's Equilibrium Tax Rates." Journal of Accounting Research, Spring 1983, pp. 329-340.

Burns and Groomer, "An Analysis of Tax Court Decisions That Assess the Profit Motive of Farming-Oriented Operations." Journal of the American Taxation Association, Fall 1983, pp. 23-39.

Robison, "Tax Court Classification of Activities Not Engaged in for Probit: Some Empirical Evidence." Journal of the American Taxation Association, Fall 1983, pp. 7-22.

Porcano and Porcano, "Incorporating Probability Analysis in Taxpayer Appeal Decisions." Journal of the American Taxation Association, Spring 1985, pp. 18-36.

Crumbley and Savich, "Use of Human Resource Accounting in Taxation." The Accounting Review, January 1975, pp. 112-117.